APPENDIX C QUALITY ASSURANCE AND QUALITY CONTROL

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1 INTRODUCTION AND BACKGROUND

1.1 Introduction

The aim of quality control and quality assurance (QA/QC) is to deliver data that is:

- representative of what is sampled;
- precise;
- accurate; and
- reproducible.

As investigations involve both field and laboratory QA/QC, these are similarly divided. The objective of this document is to evaluate and identify the data quality objectives (DQOs) and the data quality indicators (DQIs), which are used to assess whether the DQOs have been met.

All soil sampling procedures to be followed are described in full in our Soil, gas and groundwater sampling manual (Environmental Earth Sciences Ltd 2011). This document should be referred to for field procedures for sampling and conveyance. Electronic copies are available for inspection if required.

The Victorian guideline documents used in the evaluation of the data set for this investigation are:

- Australian and New Zealand Environment and Conservation Council 1992, *Australian and New Zealand Guidelines for the assessment and management of contaminated sites,* Australia and New Zealand Environment Council, National Health and Medical Research Council, Melbourne, Vic;
- EPA Victoria 2000, Publication 441, *A guide to the sampling and analysis of waters, waste-waters, soils and wastes*, EPA VIC, Southbank, Vic;
- National Environment Protection Council (NEPC) 1999, *National environment protection (assessment of site contamination) measure*, National Environment Protection Council, Adelaide, SA;
- Standards Australia 2005, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*, (AS 4482.1), Standards Australia, Sydney, NSW; and
- Standards Australia 1999, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 2: Volatile substances*, (AS 4482.2), Standards Australia, Homebush, NSW.

Data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. These are referred to as the PARCC parameters. The PARCC (and additional QA) parameters are discussed within this report.

The following items form part of the QA/QC appendix:

- repeatability;
- precision;

- accuracy;
- representativeness;
- completeness;
- comparability;
- sensitivity;
- holding times;
- blanks; and
- procedures for anomalous samples and confirmation checking.

1.2 Background

The terms “quality assurance” and “quality control” are often confused. In any program, quality control is required before assurance can be put in place. With respect to laboratory analysis activities, these terms are defined as follows:

Quality Assurance (QA) is “a set of activities intended to establish confidence that quality requirements will be met” (AS/NZS ISO 9000:2005).

This encompasses all actions, procedures, checks and decisions undertaken to ensure the accuracy and reliability of analysis results. It includes routine procedures which ensure proper sample control, data transfer, instrument calibration, the decisions required to select and properly train staff, select equipment and analytical methods, and the day to day judgements resulting from regular scrutiny and maintenance of the laboratory system. Quality Control (QC) is “a set of activities intended to ensure that quality requirements are actually being met” (AS/NZS ISO 9000:2005). In other words, the operational techniques and activities that are used to fulfil the requirements for quality.

These are the components of QA which serve to monitor and measure the effectiveness of other QA procedures by comparison with previously decided objectives. They include measurement of the quality of reagents, cleanliness of apparatus, accuracy and precision of methods and instrumentation, and reliability of all of these factors as implemented in a given laboratory from day to day.

A complete discussion of either of these terms or the steps for implementing them is beyond the scope of this document. It is widely recognised, however, that adoption of sound laboratory QA and QC procedures is essential and readers are referred to documentation available from the National Association of Testing Authorities (NATA), if further information is required.

2 DATA QUALITY OBJECTIVES

Development of data quality objectives (DQOs) for each project is a requirement of the 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. Many environmental practitioners are now following this process.

The DQO process is defined by seven steps. Each of these steps has been given due consideration in the undertaking of this project. In brief, these steps are:

Step 1: State the problem and establish the DQO team.

Step 2: Determine the possible and probable actions that will resolve the problems.

Step 3: Identify the informational inputs to assist in the problem resolution.

Step 4: Define the boundaries of the study (geographical, temporal, etc).

Step 5: Develop and define decision rules.

Step 6: Specify tolerable limits to reduce probability of incorrect decisions.

Step 7: Ensure the quality of the information obtained.

Step 1 — State the problem
The problem is that the site has been used for industrial land-use and the potential exists for soil and groundwater contamination to have occurred during this time. The site has been previously remediated by the removal of impacted soil in the south eastern corner and construction of capping layer during landscaping of the site, however this process has not been documented.

The objective of this investigation is to characterise the site cap (if any) and extent of contamination in soil and shallow fill and quantify the risks posed to beneficial users of the site in order to:

- develop performance requirements for the capping of the site based on the risk assessment prepared by the auditor and other site information;
- develop capping options to achieve the performance requirements. The assessment will consider costs, risk, site constraints and performance;
- recommend a preferred capping option with supporting modelling and documentation as required, as well as the requirements for implementation such as staging the capping and environmental management;
- report on assessment, discuss and agree actions with the stakeholders including the auditor and revise as necessary.

Step 2 — Identify the decision
These works have been commissioned to address the higher risk issues identified at the site. A decision is required on what management action is necessary (if any) to ensure the site becomes or remains suitable for its intended use. If the site is deemed not to be suitable for its intended use, direction will be given to determine what is considered by Environmental Earth Sciences VIC to be the most suitable path for making the site suitable.
Step 3 — Identify the inputs to the decision

The study inputs included a, review of previous environmental investigations undertaken at the site, data from soil investigation undertaken at the site, and reference to published criteria and site specific risk-based criteria to assist the decision-making process.

Step 4 — Define the study boundaries
The physical boundary of the study area is defined in Section 3 of the report and Figure 2 and 3.

Step 5 — Develop and define decision rules
All analytical data will be compared and evaluated against appropriate published criteria. The NEPM (1999) will be used as the primary guidance document in decision making on action levels. Dependent upon the sampling and analysis design, statistical parameters such as arithmetic mean, standard deviation and 95% upper confidence limits (95% UCLs) may be applied to designated soil populations for particular analytes.

In the event that Tier 1 action levels are exceeded, site specific risk-based Tier 2 and Tier 3 criteria will be derived. Should these criteria be exceeded the existing interim management plans will be updated and a remedial action plan will be required. These procedures constitute the alternative action plan.

Step 6 — Specify tolerable limits on decision errors
Acceptable limits for field data analysis (relative percent differences for primary and duplicate results) are between 50 and 150 percent (depending on the origin of the sample and volatility of the chemicals present). These are summarised in Table 1 as the measurement data quality indicators (MDQIs), which will be used to establish whether the DQOs have been met.

Most of the procedures in the Standards Australia AS 4482.1 (2005) *Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* and NEPM (1999) have risk probabilities associated with allowable error margins incorporated into them. It is therefore proposed that no further "tolerable limits" be investigated at this stage of the project.

Step 7 — Optimise the design
The sample design will be undertaken with reference to the Sampling design guidelines AS4482.1. As well as a statistically justifiable systematic sampling design, this sampling pattern has also taken into account targeted areas of concern on the site (i.e. judgemental sampling locations). Environmental Earth Sciences VIC believes that the sampling design is optimal considering temporal limitations and access constraints. The density of the sampling pattern and the quality of the data set are suitable for determination of the suitability of the site for its proposed current and future use.

TABLE 1 MEASUREMENT DATA QUALITY INDICATORS (MDQIS)

Parameter	Procedure	Minimum Frequency	Criteria	
			(5 to 10x LOR[4])	>10x LOR
Precision	Field Duplicates	1 in 20 - metals	<80 RPD	<50 RPD
		1 in 20 - semi-volatiles	<130 RPD	<50 RPD
		1 in 20 - volatiles	<150 RPD	<80 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
3. LOR – limit of reporting
4. [4] no limit at <5x LOR
5. * the MDQI is usually specified in the standard method. If not, use the default values set out in this table
6. ** only necessary when measuring dissolved metals and volatile organic compounds in water samples

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. The standard suggests that ≤50% RPD be used as a 'trigger' and values above this level of repeatability need to be noted and explained.

Our adopted MDQI's for precision acknowledge the intrinsic heterogeneity of metal and semivolatile chemical concentrations in disturbed soil that may potentially cause large variations in results between laboratory subsamples (although all efforts are made to homogenise non volatile duplicate samples). Similarly, large variations in volatile chemical concentrations between duplicates may be unavoidable even when using best practice sampling methodology, especially as we seek to minimise the disturbance to the sample while splitting it which means a high degree of inherent heterogeneity is expected.

As such, our adopted RPD criteria are considered to be a suitable measure for the reproducibility of results within a naturally heterogenous media such as soil. A ≤50% RPD trigger value will be used, with any exceedences being discussed and assessed for acceptability.

3 SAMPLING AND ANALYSIS PLAN

All sampling locations, methods and laboratory analysis were approved by the Environmental Auditor, Peter Nadebaum (GHD Pty Ltd), prior to the commencement of field works through the following documents:

- Environmental Earth Sciences VIC, 2010. Report number 210074 - *'Sampling and analysis plan for the former South Melbourne Gasworks, Albert Park, Victoria'*;
- GHD 31/26548/189319Letter '*Gasworks Site Environmental Audit Sampling and Analysis Plan*', dated 10 November 2010;
- SAP discussion between Environmental Earth Sciences VIC, City of Port Phillip (CoPP) and GHD on 2 December 2010
- Environmental Earth Sciences VIC, Letter 210074L1 - '*Revised site capping and NAPL investigation sampling and analysis plan for the South Melbourne Gasworks, Albert Park, Victoria*' dated 8 December 2010; and
- correspondence (*via-email*) with the auditor on 13 December 2010 and 20 December 2010.

3.1 Rationale for sampling strategy and density

Table 2 has been provided as a summary of the sampling rationale for each location assessed as part of this project.

Due to the size of Gasworks Park and South Port Community nursing home (approximately 3.21 hectares) a specialised sampling strategy was proposed. It involved systematic sampling (i.e. random sampling within a grid) of 42 locations across the site at a density of 13.1 points/ha. This strategy resulted in a diameter of 'hot-spot' detection (with a 95% level of confidence) of 33 metres and was considered sufficient to provide a reliable map of the current capping layer and concentrations of contaminates in surface and shallow soils. The 'hot-spot' grid based systematic sampling locations are presented in Figure 3. Where sample locations fell within on-site building footprints, they were relocated based on access constraints.

Furthermore, 11 grid-based sampling locations were proposed to be drilled in areas of potential source of NAPL (i.e. tar/liquor tanks and as indicated by identified groundwater contamination). Targeted test pit and borehole location rationale is detailed in Table 2. Most investigation works were undertaken via test pits to give a greater visual interpretation of the capping layer and shallow and underlying soils. In areas where test pits were impractical (i.e. access restricted, areas of hardstand), it was proposed to drill soil boreholes via a Geo-probe drill rig or hydraulic push tube drill rig.

TABLE 2 SAMPLING RATIONALE

Sampling Location	Strategy	Sampling rationale
TP1	Grid-based /Targeted	Existing capping layer investigation and historic location of tanks.
TP2-4	Grid-based	Existing capping layer investigation.
TP5-6	Grid-based	Existing capping layer investigation.
TP7	Grid-based /Targeted	Existing capping layer investigation and historic location of tar tank
TP8-10	Grid-based	Existing capping layer investigation
TP11	Grid-based /Targeted	Existing capping layer investigation and historic location of liquor well.
TP12	Grid-based	Existing capping layer investigation
TP13-16	Grid-based	Existing capping layer investigation.
TP17-19	Grid-based /Targeted	Existing capping layer investigation and groundwater wells in this area suggest NAPL may be present (i.e. potential source of contamination for GW24 and GW42) and previous reports of tar and tar staining noted during installation of GW17 (TP18).
TP20-TP26	Grid-based	Existing capping layer investigation.
BH1	Grid-based	Existing capping layer investigation.
BH2	Grid-based /Targeted	Existing capping layer investigation and historic location of separation tank (i.e. tar).
BH3-BH4	Grid-based	Existing capping layer investigation
BH5	Grid-based /Targeted	Existing capping layer investigation and historic location of tar tank, potential source of GW contamination in GW44
BH6	Grid-based	Existing capping layer investigation
BH7	Grid-based /Targeted	Existing capping layer investigation and historic location of liquor tank, potential source of GW contamination in GW44.
BH8-BH13	Grid-based	Existing capping layer investigation
BH14	Grid-based /Targeted	Existing capping layer investigation and reports of tar and tar staining noted at groundwater wells GW17 and GW23 (based on previous assessments).
BH15	Grid-based /Targeted	Existing capping layer investigation and potential of NAPL below buildings.
BH16	Grid-based	Existing capping layer investigation

3.2 Sampling methods

3.2.1 Test pits

Test pitting was undertaken via a 3 tonne excavator to a maximum depth of 3.0 meters below ground level (mBGL). A total 95 discrete soil samples were collected from 26 test pits (TP1 to TP26) across the Gasworks Park, plus five intra-laboratory and five inter-laboratory quality control (QC) samples. Test pit locations are presented in Figure 3. Samples were generally collected from the surface and 0.5 m intervals, or at distinct changes in lithology or where potential contamination was noted.

Soil samples were collected using a clean stainless steel spatula from the wall of the test pit or from the excavator bucket at depths greater that 1.5 mBGL. The samples collected from the walls of the test pits were scraped to avoid cross contamination. The soil sampled was then placed into laboratory prepared glass jars and labelled with a sampling location number, depth of sample collection, site reference and date before being placed into a chilled cooler.

During the collection of samples from test pits, a description of soil texture, colour, pH, odour and photo-ionisation detector (PID) readings were recorded for each stratigraphic unit encountered at each test pit location. Test pit logs are presented in Appendix A of the main report.

3.2.2 Boreholes

Borehole sampling was undertaken via a hydraulic push tube drill-rig to a maximum depth of 3.0 mBGL. A total of 47 discrete soil samples were collected from 16 boreholes (BH1 to BH16) across the Gasworks Park and Southport site, plus one intra-laboratory and one inter-laboratory quality control (QC) sample. Borehole locations are presented in Figure 3. Samples were generally collected from the surface and 0.5 m intervals, or at distinct changes in lithology or where potential contamination was noted.

Samples were collected from the push tube sleeve (i.e. dedicated clear disposable sleeve) using a spatula and placed into laboratory prepared glass jars. The jars were labelled with a sampling location number, depth sampled, date and site reference before being stored in a chilled cooler.

During the collection of samples from boreholes, a description of soil texture, colour, pH, odour and PID readings were recorded for each stratigraphic unit encountered at each location.

3.3 Rationale for laboratory analysis schedule

Table 3 identifies the laboratory analysis schedule for soil samples collected during this project. The analytes selected are based on previously identified CoPC for the target area, and their potential derivatives. Selected soil samples were analysed from each location for one or more of the CoPC associated with NAPL and gasworks waste including:

- heavy metals (As, Cd Cr, Cu, Pb, Ni, Hg and Zn);
- polycyclic aromatic hydrocarbons (PAHs);
- total petroleum hydrocarbons (TPHs)
- total cyanide;
- phenols;

- sulfates and sulfides; and
- benzene, toluene, ethyl benzene and xylene (BTEX).

We note that there are sufficient QA samples collected for the primary CoPC (which are considered to be PAHs and TPH) and where there are less samples collected for example phenols and sulfate/sulfide, we consider the precision of the existing samples to be sufficient-based on the calculated RPDs (refer to section 6.2.1). Note that sufficient (5%) of samples were collected over the duration of the soil investigation (seven duplicate and seven triplicate samples over 129 primary samples).

Additional analysis was undertaken based on field observations of soil heterogeneity, odour, PID readings and visual contamination. Furthermore, Australian Standard Leaching Procedure (ASLP) – via class 3b leaching fluids (i.e. acetate and tetraborate) was undertaken on selected samples to assess the leaching potential of CoPC.

The analytical methods selected are based on those recommended by the laboratories and publications such *as Standard methods for the examination of water and waste-water* (APHA 2005), *Chemical methods –Australasia* (Rayment & Lyons 2010) and *Sampling and analysis of waters, waste-waters, soils and wastes (*EPA Victoria Publication IWRG 701, 2009).

TABLE 3 ANALYTICAL SCHEDULE

Analyte – Soil	Number of samples	Number of duplicates/splits
Pb, Zn, Cd, Cr, Ni, Cu, As, Hg	123	7/-
Petroleum hydrocarbons C_6-C_{36}	129	7/7
BTEX	129	7/7
PAHs	129	7/7
Phenols	123	6/6
Sulphate/Sulphide	28	1/1
Total cyanide	48	3/3
Ammonia	9	0/0

Note: *Standard methods for the examination of water and waste-water* (APHA 2005), *Chemical methods –Australasia* (Rayment & Lyons 2010) and *Sampling and analysis of waters, waste-waters, soils and wastes* (EPA Victoria Publication IWRG 701, 2009).

4 FIELD METHODOLOGY QAQC

Soil samples were collected in accordance with with our Soil, gas & groundwater sampling manual (Environmental Earth Sciences, 2011), and with reference to:

- EPA Victoria 2009 - IWRG 701, *Sampling and analysis of waters, wastewaters, soil and wastes*;
- National Environment Protection Council (NEPC) 1999, *National environment protection (assessment of site contamination) measure*, National Environment Protection Council, Adelaide, SA;
- Standards Australia 2005, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile* compounds, (AS 4482.1), Standards Australia, Sydney, NSW; and
- Standards Australia 1999, *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 2: Volatile substances*, (AS 4482.2), Standards Australia, Homebush, NSW.

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity, sampling procedures) under which separate sets of data are produced to ensure minimal common error. Data comparability has been demonstrated by the use of standardised sampling involving:

- sampling by trained Environmental Earth Sciences field team using Environmental Earth Sciences' standard operating procedures; and
- all soil samples being collected using test pit walls/excavator bucket sampling methods where possible, and limited use of either push tube sampling methods in Soutport Nursing Home or where there were access constraints.

4.1 Calibration and maintenance of equipment

All equipment was maintained, stored and calibrated in accordance (refer to Attachment C1) with its manufacturer specifications, including included:

- all hired equipment was received with supplier calibration certification. For PID calibration the isobutylene calibration gas was received with analysis certification;
- PIDs were calibrated daily using 100 ppm iso-butylene calibration gas in addition to two isobutylene "bump" tests each day; and
- storage and transportation of equipment was carried out in a manner to maintain accuracy, namely within storage containers provided with the equipment.

4.2 Decontamination of sampling equipment

Soil samples were collected from soil profiles removed from test pit walls and excavator buckets using a clean stainless steel spatula and new nitrile gloves at each sampling location. Samples collected from the push tube were collected directly from the plastic sleeve. To prevent cross contamination the exterior of each soil bore sample was cut away (effectively skinning the soil sample) using a clean spatula. During this process the field scientist determined the colour and texture of the soil samples.

Rinsate blanks were collected each day and analysed for CoPC (further discussed in Section 6.4. For results of the three rinsate samples please refer to Section 6.4.

4.3 Sample notation details

The borehole log details for each sample collected (including time, location, initials of sampler, duplicate locations, duplicate type and field screening details) are presented in the bore logs in Appendix A of the report. The chemical analyses performed on each sample are presented on the chain of custody documentation (Appendix B of the report) which also identify for each sample – nature of the sample, collection date, analyses to be performed, sample preservation method (if any) and departure time from the site.

4.4 Sample handling/preservation

Samples were placed in laboratory supplied jars or bags and stored on ice in a darkened Esky and often transported to a refrigerator at Environmental Earth Sciences office. Samples were kept at temperatures of less than 4^{o}C until being couriered with ice in Eskies to the designated laboratories for analysis.

All samples received at ALS Melbourne laboratory recorded a temperature between 5.2 ^{o}C and 22.6 ^{o}C, with ice as follows:

- EM1100639 – 15.4- 18.6 ^{o}C;
- EM1100640 – 15.4- 18.6 ^{o}C;
- EM1100641 – 15.4- 18.6 ^{o}C;
- EM1100885 – 15.2-17.4 ^{o}C;
- EM1100937 – 10.0-12.0 ^{o}C;
- EM1101106 – temperature not recorded on SRN;
- EM1101370 – 18.8 -22.6 ^{o}C; and
- EM1102076 – 5.2-5.4 ^{o}C.

All Eskies were received with security seal intact (refer to sample receipt notifications (SRN) presented in attachment C4 and Appendix B of the main report). However, as the COCs were emailed to the laboratory a signature was not provided on the COC. The details of the SRN show both the sample time and laboratory received time.

All samples received at ALS Melbourne laboratory were noted by the laboratory as being correctly preserved and submitted within recommended holding times.

All samples received at SGS Melbourne laboratory were noted as being received cool with ice present, in good order and in correct containers (refer to sample receipt advice attached to the main report as Appendix B).

5 LABORATORY QA/QC

The analytical methods selected are based on those recommended by the laboratories and publications such as Soil Chemical methods –Australasia (Rayment & Lyons 2010), Sampling and analysis of waters, waste-waters, soils and wastes (EPA Victoria 2009) and NEPM (1999) Schedule B(3) Appendix 2. These methods were provided in the SAP

presented to and approved by the Environmental Auditor at the time prior to field work commencing.

5.1 Laboratory selection

To assist in data comparability (as defined in Section 4.0) standardised analysis procedures should be used. All primary laboratory analysis was conducted by ALS Environmental to eliminate disparity of methods and results between different laboratories, with SGS Australia acting as the secondary check laboratory. Both laboratories used the same analytical methods which are accredited by NATA..

Details of the samples sent to each laboratory and the analysis requested are contained in the chain of custody documentation held in Appendix B of the report. The analytical methods are noted on the laboratory transcripts.

5.2 Internal laboratory QAQC

Both ALS and SGS completed internal laboratory quality control procedures in compliance with NEPM (1999) Schedule B(3) Appendix 2, including:

- Laboratory control samples (5%);
- Method blanks (5%);
- Matrix spikes (5%);
- Laboratory duplicates (10%); and
- Surrogate spikes (Laboratory Control Spike) (on all target organic analysis in accordance with NEPM, 1999).

The results are presented in a separate Quality Control Report (QC report) and Interpretative Quality Control Report (QCI report) for ALS results (Attachments C2 and C3) and within Appendix B of the main report.

These reports include details of surrogates and spikes used, percent recoveries of surrogates and spikes used, the instrument detection limits, the method detection limits, the practical quantification limits and the reference samples results. Any non-compliance with internal laboratory quality control detailed in these reports have been assessed and is the result of high level of contaminants present within the samples and results adjusted accordingly. The minimal number of non-compliance detailed in the following reports (EM1100639, EM1100641, EM1100885 and EM1100937)have been determined not to impact the quality of the data as this could be due to the heterogeneity of the soil samples analysed.

6 MEASUREMENT DATA QUALITY OBJECTIVES

Step 7 of the DQO process (Section 2.0) is a focus on the quality of the information by measurement, that is, measurement data quality objectives (MDQOs). The aim of a quality control and quality assurance (QA/QC) is to deliver data that is representative of what is sampled, precise, accurate and reproducible. As investigations involve both field and laboratory QA/QC, these are similarly divided. The objective of this section is to provide the

MDQOs and the measurement data quality indicators (MDQIs), which will be used to establish whether the DQOs have been met.

Measurement data quality is typically discussed in terms of precision, accuracy, representativeness, comparability and completeness. Although not necessarily considered in list order, the following items should form part of the QA/QC data evaluation:

- Measured Parameters: precision, accuracy, repeatability (comparability), blanks; and
- Assessed Parameters: completeness, representative of site conditions, sensitivity, and holding times.

The QA parameters selected and the criteria used to evaluate the analytical data are defined below and presented in Table 1 of this report.

6.1 Repeatability (Field collected intra-laboratory duplicates)

These samples provide a check on the analytical performance of the laboratory. At least 5 percent of soil samples (1 in 20) per day of sampling from a site are collected in duplicate.

For comparability of data, it is important that there is little delay in the sample submission. Soil heterogeneity due to the "nugget effect" could result in significantly greater difference, particularly for metals. Consequently, samples with the most observable field homogeneity are selected.

Any value >50% RPD will be noted and discussed, as per Standards Australia requirements, with respect to its acceptability for inclusion in the data-set.

6.2 Precision

Precision is a measure of the reproducibility of results, and is assessed on the basis of agreement between a set of replicate results obtained from duplicate analyses. The precision of a duplicate determination can be measured as relative percentage difference (RPD), and is calculated from the following equation:

$$RPD = \left[\frac{X1 - X2}{\left(\frac{X1 + X2}{2} \right)} \right] \times 100$$

where: X1 is the first duplicate value

X2 is the second duplicate value

The field blind and split duplicate results and calculated RPDs are presented in Table 5. All results are considered to be within the acceptable range.

6.2.1 Field blind and split duplicate RPDs

Overall, 7 field blind and split duplicates (DUP/Split 1-6 and DUP/Split 8) were collected and submitted for laboratory analysis as part of this project. All QC duplicate samples were

collected in triplicate with the primary sample, with the exception of DUP 8 and Split 8 which were collected on separate parent samples due to limited soil in the push-tube core.

The RPDs have been calculated and present in Table 5 attached. A number of RPDs that exceeded the Australian Standard control limit of 50% were the result of low concentrations magnifying the RPDs, which has been taken into account with project specific MDQOs (Table C1) which include:

- no RPD criteria if sample concentrations < 5 x MDL; and
- RPD of less than 150% for volatile analytes, 130% for semi-volatile analytes and less than 80% for all other analytes if 5 x MDL < concentrations < 10 x MDL.

These RPDs above 50% have been included in the data set based on these criteria. RPDs above 50% for sample concentrations > 10 x MDL have been highlighted in Table 5 and include:

- zinc in TP4(0.25-0.3)/DUP1 and BH16 (0.2-0.3)/DUP8; and
- select PAHs in TP14(0.5-0.6)/DUP3 and BH16 (0.2-0.3)/DUP8.

These RPDs are most likely due to sample heterogeneity, particularly as the high RPDs are noted across a range of different analytes between intra-laboratory duplicate samples, while the inter-laboratory duplicates satisfy MDQO. As these remaining high RPDs do not indicate an underlying quality control issue and are proportionally insignificant (given the large sample size) they do not compromise the integrity of the data set.

To be conservative, the higher PAH concentrations will be adopted where there is significant disparity between the primary and duplicate sample (PAHs being the primary consideration on this site). Therefore DUP3 results shall be adopted for interpretative use instead of the primary sample TP14 (0.5-0.6), however it shall continue to be referred to as shall be referred to as TP14 (0.5-0.6) in the main report for consistency. PAH results from primary sample BH16 (0.2-0.3), as the higher concentrations, shall be retained for interpretative use in the main report.

6.3 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. The determination of accuracy can be achieved through the analysis of known reference materials or assessed by the analysis of matrix spikes. Accuracy is measured in terms of percentage recovery as defined by the following equation:

$$\%R = \frac{SSR - SR}{SA} \times 100$$

where: %R = percentage recovery of the spike

SSR = spiked sample result

SR = sample result (native)

SA = spike added

Laboratories calculate percentage recoveries of spiked compounds, which are evaluated against control or acceptance limits taken from the appropriate method or the Contract Laboratory Program Statement of Work. If the spike recovery for a sample does not fall within the prescribed control limits, laboratory based corrective action is required.

Surrogate spikes consist of spiking non-target compounds into the sample prior to analysis. The spiked compounds are expected to behave during analysis in the same way as the target compounds. Every sample is spiked prior to extraction or analysis with surrogate compounds that are representative of the analysis. If surrogate spike recovery does not meet the prescribed control limits, samples should be reanalysed.

For inorganic analyses, certified reference materials are analysed.

6.4 Blanks

To meet the QC acceptance criteria, blanks should have no detectable concentrations of the target compounds. The three rinsate blanks and four trip blanks did not report detectable concentrations of CoPC.

This indicates that cross-contamination between sampling locations and between samples during transport did not occur.

Three rinsate samples were collected on the 18, 19 and 20 January 2011. On these days, samples were being collected from test pits and thus a rinsate sample was collected. On the 27 and 28 January samples were collected from a push tube, therefore, the risk of cross contamination is low as no reusable equipment was used. As such, we consider three rinsate samples analysed to be sufficient. Furthermore, rinsate samples were analysed for the following:

- dissolved metals (As, Cd, Cr, Cu, Pb, Ni, Hg and Zn);
- TPH (C6-C9), TPH (C10-C36);
- BTEX; and
- PAH.

Three trip blanks were also collected and analysed for TPH (C6-C9) and BTEX. The results of the rinsate and trip blanks are presented in the following table.

TABLE 4 RINSATE AND TRIP BLANK RESULTS

Analyte	Units	Rinsate (1)	Rinsate (2)	Rinsate (3)	Trip 1	Trip 2	Trip 3
Dissolved Metals							
Arsenic	mg/L	<0.001	<0.001	<0.001	---	---	---
Cadmium	mg/L	<0.0001	<0.0001	<0.0001	---	---	---
Chromium	mg/L	<0.001	<0.001	<0.001	---	---	---
Copper	mg/L	<0.001	<0.001	<0.001	---	---	---
Nickel	mg/L	<0.001	<0.001	<0.001	---	---	---

Analyte	Units	Rinsate (1)	Rinsate (2)	Rinsate (3)	Trip 1	Trip 2	Trip 3
Lead	mg/L	<0.001	<0.001	<0.001	---	---	---
Zinc	mg/L	<0.005	<0.005	<0.005	---	---	---
Mercury	mg/L	<0.0001	<0.0001	<0.0001	---	---	---
Polynuclear Aromatic Hydrocarbons							
Naphthalene	µg/L	---	<1.0	<1.0	---	---	---
Acenaphthylene	µg/L	---	<1.0	<1.0	---	---	---
Acenaphthene	µg/L	---	<1.0	<1.0	---	---	---
Fluorene	µg/L	---	<1.0	<1.0	---	---	---
Phenanthrene	µg/L	---	<1.0	<1.0	---	---	---
Anthracene	µg/L	---	<1.0	<1.0	---	---	---
Fluoranthene	µg/L	---	<1.0	<1.0	---	---	---
Pyrene	µg/L	---	<1.0	<1.0	---	---	---
Benz(a)anthracene	µg/L	---	<1.0	<1.0	---	---	---
Chrysene	µg/L	---	<1.0	<1.0	---	---	---
Benzo(b)fluoranthene	µg/L	---	<1.0	<1.0	---	---	---
Benzo(k)fluoranthene	µg/L	---	<1.0	<1.0	---	---	---
Benzo(a)pyrene	µg/L	---	<0.5	<0.5	---	---	---
Indeno(1.2.3.cd)pyrene	µg/L	---	<1.0	<1.0	---	---	---
Dibenz(a.h)anthracene	µg/L	---	<1.0	<1.0	---	---	---
Benzo(g.h.i)perylene	µg/L	---	<1.0	<1.0	---	---	---
BTEX							
Benzene	µg/L	<1	<1	<1	<1	<1	<1
Toluene	µg/L	<2	<2	<2	<2	<2	<2
Ethylbenzene	µg/L	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	µg/L	<2	<2	<2	<2	<2	<2
ortho-Xylene	µg/L	<2	<2	<2	<2	<2	<2
Total Petroleum Hydrocarbons							
C_6 - C_9 Fraction	µg/L	<20	<20	<20	<20	<20	<20
C_{10} - C_{14} Fraction	µg/L	---	<50	<50	---	---	---
C_{15} - C_{28} Fraction	µg/L	---	<100	<100	---	---	---
C_{29} - C_{36} Fraction	µg/L	---	<50	<50	---	---	---
C_{10} - C_{36} Fraction (sum)	µg/L	---	<50	<50	---	---	---
Total Recoverable Hydrocarbons - NEPM 2010 Draft							
C_6 - C_{10} Fraction	µg/L	<20	<20	<20	<20	<20	<20

Analyte	Units	Rinsate (1)	Rinsate (2)	Rinsate (3)	Trip 1	Trip 2	Trip 3
>C_{10} - C_{16} Fraction	µg/L	---	<100	<100	---	---	---
>C_{16} - C_{34} Fraction	µg/L	---	<100	<100	---	---	---
>C_{34} - C_{40} Fraction	µg/L	---	<100	<100	---	---	---

6.5 Completeness

The following information is required to check for completeness of data sets:

- chain-of-custody forms (completed by Environmental Earth Sciences and the laboratory);
- sample receipt forms;
- all requested sample results reported;
- all blank data reported;
- all laboratory duplicates reported and relative percent differences (RPDs) calculated;
- all surrogate spike data reported;
- all matrix spike data reported; and
- NATA stamp on reports.

6.6 Sensitivity

When interferences are present in the sample, a loss of sensitivity can occur resulting in an increase in the method detection limit. In some instances (e.g. where one or more compounds have particularly high concentrations) the sample must be diluted for analysis. This increases the method detection limit by the dilution factor.

The detection limits achieved by the laboratory, when adjusted for dry weight and interferences from the presence of other chemicals within the sampled matrix, must be less than half the site criteria for all analytes tested (i.e. 2 x LOR <site criteria).

6.6.1 Limit of reporting (LORs)

There were increases to LORs due to the presence of high levels of PAHs in samples:

- TP7 (1.75-1.8);
- multiple samples in work order EM1100640;
- BH11 (0.5-0.6); and
- BH15 (0.8-0.9).

All detection limits achieved by the laboratory, when adjusted for dry weight and interferences from the presence of other chemicals within the sampled matrix, must be less than half the site criteria for all analytes tested. All MDLs from both primary and secondary laboratories, were assessed against this criteria of 2 x MDL < Tier 1 criteria, and determined to be acceptable for inclusion into the data set.

6.7 Sample holding times

All primary analysis were undertaken within recommended holding times, however, a number of additional analysis reported holding time non-compliances due to a delay in the reporting of primary analysis that determined the speciation and leachate analysis program. The results have been included in the data set, however PAH leachate results should be interpreted with caution and even treated as a semi-quantitative analysis.

The TPH speciation results are very definitive, i.e. 100% aromatic, which corresponds with the high PAH concentrations. Thus a small amount of error due to delay in analysis does not alter the conclusions drawn from this data and has no impact on the outcome of this investigation but extra caution should be noted when using this data.

TABLE 5 HOLDING TIME NON-COMPLIANCES

Work Order	No. of Samples	Analyte	Holding time exceedance
EM1101106	4	PAH – ASLP leach	8 days (analysis)
	8	PAH – ASLP leach	7 days (analysis)
	2	PAH – ASLP leach	6 days (analysis)
EM1101106	4	TPH -Speciation	7 days (extraction)
	4	TPH -Speciation	6 days (extraction)
	3	TPH -Speciation	5 days (extraction)
EM1100937	2	Total cyanide	4 days (extraction)

The holding time for total cyanide extraction was exceeded by 4 days for BH15 (0.4-0.5) and BH10 (0.2-0.3). This occurred due to laboratory error, however the cyanide result for BH10 (0.2-0.3) is relatively consistent with other samples of comparable stratigraphy with visible gasworks waste impacts.

6.8 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition.

Representativeness is primarily dependent on the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handling and analysis protocols, and use of proper chain-of-custody and documentation procedures. Blanks, holding times and field duplicates are all QA parameters that can assist in the analysis of representativeness for data point evaluation and have been analysed as part of the measurement data quality assessment with the following conclusions:

- with the exception of the ASLP leaches for PAHs 14 samples, holding time breaches are not considered to be significant;

- trip blanks, rinsate blanks all indicates that adherence to sample handling, transport and analysis protocols was sufficient; and
- the small number of unexplained RPDs that fail MDQO criteria are most likely due to sample heterogeneity and given the large sample size these RPDs are proportionally insignificant and do not compromise the integrity of the data set.

This assessment of blanks, holding times and field duplicates all indicate the data is representative.

7 DATA SET CONCLUSION

The aim of quality control and quality assurance (QA/QC) is to deliver data that is:

- representative of what is sampled;
- precise;
- accurate; and
- reproducible.

The following comments can be viewed as an overall summary of the quality of the analytical component for the site capping investigation works at South Meolbourn Gasworks and SouthPort Nursing home.

7.1 Comparability

Data comparability has been demonstrated by:

- the use of standardised sampling involving:
  - sampling by trained Environmental Earth Sciences field team using Environmental Earth Sciences' standard operating procedures; and
  - all soil samples being collected using test pit walls/excavator bucket sampling methods where possible, and limited use of either push tube sampling methods in more sensitive areas or where there were access constraints.
- sample integrity and container requirements were recorded on chain of custody documentation and laboratory sample receipt advice forms as being satisfactory; and
- standardised laboratory analysis procedures by both primary laboratory and secondary check laboratory.

7.2 Repeatability/precision

The field blind and split duplicates were sampled at the 5% sampling frequency required (Australian Standards) for TRH and PAH, which were considered to be the main CoPC. It is noted that other analytes such as heavy metals, phenols, sulphate and total cyanide were sampled below the 5% sampling frequency. Both ALS and SGS completed internal laboratory quality control procedures in compliance with the frequencies required under NEPM (1999) Schedule B(3) Appendix 2 to adequately assess repeatability and precision of the data set.

A small number of field split and blind duplicates indicated excessive RPD values. However, whilst exceeding acceptable RPD criteria, the majority of pertinent samples had relatively low analyte concentrations only marginally above the stated laboratory levels of reporting. In RPD calculations, lower comparable analyte concentrations can result in a greater percentage variation in RPD. Subsequently, the high RPD values obtained for samples with low analyte concentrations are of relatively minor importance. Other exceeding RPD values were due to the heterogenous material from which they were obtained resulting in a nugget effect.

To be conservative, the higher concentrations were adopted where there was significant disparity between the primary and duplicate sample. This resulted in DUP3 PAH results being adopted for interpretative use instead of the primary sample TP14 (0.5-0.6), however it shall continue to be referred to as shall be referred to as TP14 (0.5-0.6) in the main report for consistency.

Other methods to ensure quality control including use of NATA accredited laboratories, consistent of intra-laboratory duplicate results. Heavy metal results consistent with site history, geology, stratigraphy field observations and previous experience on gasworks sites. and therefore the lack of inter-laboratory duplicates for heavy metals reduces the reliability of the heavy metal results, however as they are not the primary CoPC nor will they be the driving factor determining remediation, heavy metal data uncertainty does not change the report's outcomes and conclusions.

Environmental and Earth Sciences consider that the minor proportion of field blind duplicate, and laboratory duplicate sample RPD values that do not meet MDQO, are not indicative of compromised data and do not jeopardise the report's conclusions.

7.3 Accuracy

There were some Laboratory control surrogate recovery, matrix spike recoveries and surrogate recoveries non-compliances due to high levels of contaminants, however as a percentage of the total number undertaken they are not considered significant, indicating that laboratory accuracy is acceptable.
Laboratory control surrogate recovery, matrix spike recoveries and surrogate recoveries all meet the data quality objectives and are therefore acceptable.

7.4 Blanks

All field blanks, including trip and rinsate blanks, and laboratory QC/QA method blanks were found to be free of analyte concentrations above the reported LORs, thus satisfy the MDQO.

7.5 Completeness

All data sets are complete.

7.6 Sensitivity

All MDLs from both primary and secondary laboratories, were assessed against acceptance MDQO criteria of 2 x MDL < Tier 1 criteria, and determined to be acceptable for inclusion into the data set.

7.7 Holding times

The few minor holding time non-compliances were not considered to be significant, with the exception of ASLP leaches for PAHs. The results have been included in the data set, however should be interpreted with caution and even treated as a semi-quantitative analysis.

7.8 Representativeness

Representativeness is primarily dependent on the design and implementation of the sampling program. Representativeness of the data was assured by:

- development of a robust and well-designed SAP and SMP;
- avoidance of contamination;
- adherence to sample handling and analysis protocols;
- use of proper chain-of-custody and documentation procedures;
- assessment of blanks, holding times and field duplicates all indicate the data is representative; and
- an evaluation of the whole data set that established the data as compatible.

7.9 Summary

In summary, assurance of quality data has been based on development of an approved sampling and analysis plan, appropriate field methodology, careful selection of laboratories and assessment of data against the MDQO's.

The QC/QA data reported by ALS and SGS for the documented soil samples were determined to be of sufficient quality to be considered acceptable to comply with the Environmental Earth Sciences quality protocols for the project.

This report has therefore concluded that the QC/QA data set and field duplicate results are free of systematic, method biases and field sampling errors, and the data is representative of the site conditions. It can be confidently stated that the MDQO's for this project have been met and the data set is considered to be reliable.

8 QAQC APPENDIX REFERENCES

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TABLE 5

TABLE 5 Field Blind and Split Duplicate RPD Tables

Work order		EM1100639	EM1100641		EM1100639	ME105140		EM1100639	EM1100641		EM1100639	ME105140		EM1100640	EM1100641		EM1100640	ME105140		EM1100640	EM1100641	
Field ID		TP4(0.25-0.3)	DUP 1	RPD %	TP4(0.25-0.3)	SPLIT 1	RPD %	TP8 (0.6-0.7)	DUP2	RPD %	TP8 (0.6-0.7)	SPLIT 2	RPD %	TP14 (0.5-0.6)	DUP 3	RPD %	TP14 (0.5-0.6)	SPLIT 3	RPD %	TP17 (0.0-0.1)	DUP 4	RPD %
Date sampled		18/01/2011	18/01/2011		18/01/2011	18/01/2011		18/01/2011	18/01/2011		18/01/2011	18/01/2011		19/01/2011	19/01/2011		19/01/2011	19/01/2011		21/01/2011	20/01/2011	
Analytes	**Units**																					
Arsenic	mg/kg	43	30	35.6	---	---	---	28	21	29	---	---	---	14	22	44	---	---	---	<5	<5	0
Cadmium	mg/kg	<1	<1	0.0	---	---	---	<1	<1	0	---	---	---	<1	<1	0	---	---	---	<1	<1	0
Chromium	mg/kg	12	10	18.2	---	---	---	11	6	59	---	---	---	19	25	27	---	---	---	2	3	40
Copper	mg/kg	<5	<5	0.0	---	---	---	<5	<5	0	---	---	---	<5	<5	0	---	---	---	<5	5	0
Lead	mg/kg	12	16	28.6	---	---	---	6	<5	18	---	---	---	18	15	18	---	---	---	11	11	0
Nickel	mg/kg	4	5	22.2	---	---	---	3	<2	40	---	---	---	6	9	40	---	---	---	5	3	50
Zinc	mg/kg	17	124	**151.8**	---	---	---	6	<5	18	---	---	---	13	7	**60**	---	---	---	13	15	14
Mercury	mg/kg	0.1	0.1	0.0	---	---	---	<0.1	<0.1	0	---	---	---	<0.1	<0.1	0	---	---	---	<0.1	<0.1	0
Total Cyanide	mg/kg	<1	1	0.0	<1	0.2	**133.3**	<1	<1	0	<0.1	0.2	**67**	3	4	29	3	1.1		---	---	---
Ammonia as N	mg/kg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sulphate (NEPM)	mg/kg	---	---	---	---	---	---	90	90	0	---	---	---	---	---	---	---	---	---	---	---	---
Phenolic Compounds	mg/kg																					
Phenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2-Chlorophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2-Methylphenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
3- & 4-Methylphenol	mg/kg	<1.0	<1.0	0.0	<1.0	<0.20	0	<1.0	<1.0	0	<1.0	<0.20	0	<1.0	<1.0	0	<1.0	<0.20	0	<1.0	<1.0	0
2-Nitrophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2.4-Dimethylphenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2.4-Dichlorophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.50	0	<0.5	<0.5	0	<0.5	<0.50	0	<0.5	<0.5	0	<0.5	<0.50	0	<0.5	<0.5	0
2.6-Dichlorophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
4-Chloro-3-Methylphenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2.4.6-Trichlorophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
2.4.5-Trichlorophenol	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
Pentachlorophenol	mg/kg	<2.0	<2.0	0.0	<2.0	<0.20	0	<2.0	<2.0	0	<2.0	<0.20	0	<2.0	<2.0	0	<2.0	<0.20	0	<2.0	<2.0	0
PAH																						
Naphthalene	mg/kg	0.7	0.6	15.4	0.7	0.35	**66.7**	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	0.8	46	<0.5	<0.20	0	<0.5	<0.5	0
Acenaphthylene	mg/kg	0.7	1.7	**83.3**	0.7	1.9	**92.3**	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	1.5	**100**	<0.5	<0.20	0	<0.5	<0.5	0
Acenaphthene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
Fluorene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
Phenanthrene	mg/kg	3.5	5.1	37.2	3.5	2.8	22.2	1.6	<0.5	**105**	1.6	<0.20	**156**	1	13.9	**173**	1	<0.20	**133**	0.6	0.9	40
Anthracene	mg/kg	0.8	1.8	**76.9**	0.8	1.3	47.6	0.7	<0.5	33	0.7	<0.20	**111**	<0.5	4.1	**157**	<0.5	<0.20	0	<0.5	<0.5	0
Fluoranthene	mg/kg	3.8	7.4	**64.3**	3.8	6.1	46.5	1.3	<0.5	**89**	1.3	<0.20	**147**	1.6	16.7	**165**	1.6	<0.20	**156**	1.4	1.5	7
Pyrene	mg/kg	4.6	7.6	49.2	4.6	6.6	35.7	1.2	<0.5	**82**	1.2	<0.20	**143**	1.4	13.8	**163**	1.4	<0.20	**150**	1.3	1.4	7
Benz(a)anthracene	mg/kg	1.5	3.5	**80.0**	1.5	3.1	**69.6**	<0.5	<0.5	0	<0.5	<0.20	0	0.7	5.1	**152**	0.7	<0.20	**111**	0.7	0.6	15
Chrysene	mg/kg	1.7	3.2	**61.2**	1.7	2.9	**52.2**	<0.5	<0.5	0	<0.5	<0.20	0	0.5	4.7	**162**	0.5	<0.20	**86**	0.5	0.7	33
Benzo(b)fluoranthene	mg/kg	1.7	2.5	38.1	1.7	4.2	**84.7**	<0.5	<0.5	0	<0.5	<0.20	0	0.7	3.5	**133**	0.7	<0.20	**111**	0.9	0.5	**57**
Benzo(k)fluoranthene	mg/kg	1.3	3.2	**84.4**	1.3	1.6	20.7	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	2.9	**141**	<0.5	<0.20	0	<0.5	<0.5	0
Benzo(a)pyrene	mg/kg	2.3	3.7	46.7	2.3	3.9	51.6	<0.5	<0.5	0	<0.5	<0.20	0	0.6	3.6	**143**	0.6	<0.20	**100**	0.7	0.6	15
Indeno(1.2.3.cd)pyrene	mg/kg	1.2	1.8	40.0	1.2	2	50.0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	2.1	**123**	<0.5	<0.20	0	<0.5	<0.5	0
Dibenz(a.h)anthracene	mg/kg	<0.5	0.6	18.2	<0.5	0.46	0.0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0
Benzo(g.h.i)perylene	mg/kg	1.8	2.1	15.4	1.8	2.5	32.6	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	2.6	**136**	<0.5	<0.2	0	<0.5	0.6	0
BTEX																						
Benzene	mg/kg	<0.2	<0.2	0.0	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.2	0
Toluene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Ethylbenzene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
meta- & para-Xylene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0
ortho-Xylene	mg/kg	<0.5	<0.5	0.0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
TPH																						
C6 - C9 Fraction	mg/kg	<10	<10	0.0	<10	<20	0.0	<10	<10	0	<10	<20	0	<10	<10	0	<10	<20	0	<10	<10	0
C10 - C14 Fraction	mg/kg	<50	<50	0.0	<50	<100	0.0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0
C15 - C28 Fraction	mg/kg	<100	140	33.3	<100	160	46	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0
C29 - C36 Fraction	mg/kg	<100	170	**51.9**	<100	<100	0.0	<100	<100	0	<100	<100	0	<100	150	40	<100	<100	0	<100	<100	0
C10 - C36 Fraction (sum)	mg/kg	<50	310	**144.4**	<50	<200	0.0	<50	<50	0	<50	<100	0	<50	150	**100**	<50	<100	0	<50	<50	0
C10 - C36 Fraction (sum)	mg/kg	<50	310	**144.4**	<50	<200	0.0	<50	<50	0	<50	<100	0	<50	150	**100**	<50	<100	0	<50	<50	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: 130 (5-10 x EQL); 50 (> 30 x EQL)

Work order		EM1100640	ME105140		EM1100641	EM1100641		EM1100641	ME105140		EM1100641	EM1100641		EM1100641	ME105140		EM1101370	EM1101415		EM1101370	ME105371	
Field ID		TP17 (0.0-0.1)	SPLIT 4	RPD %	TP22 (2.4-2.5)	DUP 5	RPD %	TP22 (2.4-2.5)	SPLIT 5	RPD %	TP26 (1.7-1.8)	DUP 7	RPD %	TP26 (1.7-1.8)	SPLIT 7	RPD %	BH16 (0.2-0.3)	DUP 8	RPD %	BH13 (0.1-0.4)	SPLIT 8	RPD %
Date sampled		21/01/2011	21/01/2011		21/01/2011	20/01/2011		21/01/2011	21/01/2011		21/01/2011	20/01/2011		21/01/2011	21/01/2011		27/01/2011	27/01/2011		27/01/2011	27/01/2011	
Analytes	**Units**																					
Arsenic	mg/kg	---	---	---	---	---	---	---	---	---	<5	<5	0	---	---	---	16	5	**105**	---	---	---
Cadmium	mg/kg	---	---	---	---	---	---	---	---	---	<1	<1	0	---	---	---	<1	<1	0	---	---	---
Chromium	mg/kg	---	---	---	---	---	---	---	---	---	5	4	22	---	---	---	13	27	**70**	---	---	---
Copper	mg/kg	---	---	---	---	---	---	---	---	---	<5	<5	0	---	---	---	22	14	44	---	---	---
Lead	mg/kg	---	---	---	---	---	---	---	---	---	<5	<5	0	---	---	---	87	61	35	---	---	---
Nickel	mg/kg	---	---	---	---	---	---	---	---	---	6	3	**67**	---	---	---	14	21	40	---	---	---
Zinc	mg/kg	---	---	---	---	---	---	---	---	---	<5	<5	0	---	---	---	285	65	**126**	---	---	---
Mercury	mg/kg	---	---	---	---	---	---	---	---	---	<0.1	<0.1	0	---	---	---	<0.1	0.2	**67**	---	---	---
Total Cyanide	mg/kg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---
Ammonia as N	mg/kg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---
Sulphate (NEPM)	mg/kg	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		---	---	---
Phenolic Compounds	mg/kg																					
Phenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2-Chlorophenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2-Methylphenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
3- & 4-Methylphenol	mg/kg	<1.0	<0.20	0	---	---	---	---	---	---	<1.0	<1.0	0	<1.0	<0.20	0	<1.0	<1.0	0	<1.0	<0.20	0
2-Nitrophenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2.4-Dimethylphenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2.4-Dichlorophenol	mg/kg	<0.5	<0.50	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.50	0	<0.5	<0.5	0	<0.5	<0.50	0
2.6-Dichlorophenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
4-Chloro-3-Methylphenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2.4.6-Trichlorophenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
2.4.5-Trichlorophenol	mg/kg	<0.5	<0.20	0	---	---	---	---	---	---	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0
Pentachlorophenol	mg/kg	<2.0	<0.20	0	---	---	---	---	---	---	<2.0	<2.0	0	<2.0	<0.20	0	<2.0	<2.0	0	<2.0	<0.20	0
PAH																						
Naphthalene	mg/kg	<0.5	<20	0	<0.5	<0.5	0	<0.5	<0.20	0	1.5	1.2	22.222	1.5	3.9	**89**	2.8	0.8	**111**	<0.5	<0.4	0
Acenaphthylene	mg/kg	<0.5	0.6	18	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.38	**155**	2.6	3.2	21	1	0.8	22
Acenaphthene	mg/kg	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.4	0
Fluorene	mg/kg	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.42	17	1	1.1	10	<0.5	<0.4	0
Phenanthrene	mg/kg	0.6	0.83	32	<0.5	<0.5	0	<0.5	<0.20	0	1	0.9	10.526	1	1.1	10	28	13.6	**69**	3.2	2.6	21
Anthracene	mg/kg	<0.5	0.42	17	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.47	6	8.5	4.6	**60**	1.1	0.94	16
Fluoranthene	mg/kg	1.4	2.6	**60**	<0.5	<0.5	0	<0.5	<0.20	0	1.1	0.9	20	1.1	1.2	9	35.1	21.2	49	6.2	5.6	10
Pyrene	mg/kg	1.3	2.4	**59**	<0.5	<0.5	0	<0.5	<0.20	0	0.9	0.7	25	0.9	0.94	4	31.9	20.5	44	5.9	5.4	9
Benz(a)anthracene	mg/kg	0.7	1.4	**67**	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.45	11	18	10.5	**53**	3.1	2.6	18
Chrysene	mg/kg	0.5	1.2	**82**	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.42	17	13.6	9.2	39	2.4	2.4	0
Benzo(b)fluoranthene	mg/kg	0.9	1.6	**56**	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.4	22	20.9	6.8	**102**	3.7	3.4	8
Benzo(k)fluoranthene	mg/kg	0.6	0.79	27	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.24	**70**	7.2	8.8	20	1.5	1.2	22
Benzo(a)pyrene	mg/kg	1.3	1.3	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	0.38	27	15.8	9.6	49	3.2	2.8	13
Indeno(1.2.3.cd)pyrene	mg/kg	0.6	0.75	22	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	7.6	4.7	47	1.6	1.3	21
Dibenz(a.h)anthracene	mg/kg	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	<0.5	<0.5	0	<0.5	<0.20	0	2.6	1.5	**54**	<0.5	<0.4	0
Benzo(g.h.i)perylene	mg/kg	<0.5	0.9	**57**	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0	9	5.6	47	1.9	1.7	11
BTEX																						
Benzene	mg/kg	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.2	0	<0.2	<0.1	0
Toluene	mg/kg	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
Ethylbenzene	mg/kg	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
meta- & para-Xylene	mg/kg	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0	<0.5	<0.5	0	<0.5	<0.2	0
ortho-Xylene	mg/kg	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0	<0.5	<0.1	0
TPH																						
C6 - C9 Fraction	mg/kg	<10	<20	0	<10	<10	0	<10	<20	0	<10	<10	0	<10	<20	0	<10	<10	0	<10	<20	0
C10 - C14 Fraction	mg/kg	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<50	0	<50	<100	0
C15 - C28 Fraction	mg/kg	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	400	350	13	<100	<200	0
C29 - C36 Fraction	mg/kg	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	<100	<100	0	280	210	29	140	<200	0
C10 - C36 Fraction (sum)	mg/kg	<50	<100	0	<50	<50	0	<50	<100	0	<50	<50	0	<50	<100	0	680	560	19	140	<200	0
C10 - C36 Fraction (sum)	mg/kg	<50	<100	0	<50	<50	0	<50	<100	0	<50	<50	0	<50	<100	0	680	560	19	140	<200	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: 130 (5-10 x EQL); 50 (> 30 x EQL)

ATTACHMENT C1 EQUIPMENT CALIBRATION AND MAINTENANCE RECORDS

ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

Equipment Calibration Record – Minirae 3000

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

Equipment Type: Rae Systems Minirae 3000 PID

Equipment Number: _____

Date Calibrated: 10 Feb 2011

Calibrated By: Shane Furlong / Vanessa Round (name)

Job Number: 210074

Details of Calibration:

Fresh Air Calibration: 0.0 ppm

* 100 ppm Isobutylene Calibration: 43.5 ppm reading (PID calibration set to this) ppm

Isobutylene Cylinder Expiration Date: _____

Isobutylene Cylinder Lot Number : 77175

Battery Reading: _____ V

Filter Checked (Condition): ✓

* Record the concentration of the calibration standard

ATTACHMENT C2 ALS QUALITY CONTROL (QC) REPORTS

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1100639**	Page	: 1 of 14
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 03-NOV-2011
Order number	: 210074		
		No. of samples received	: 36
Quote number	: ME/015/11 V3	No. of samples analysed	: 33

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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*
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Xingbin Lin	Senior Organic Chemist	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1646514)									
EB1100893-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	<1.0	<1.0	0.0	No Limit
EM1100634-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.7	1.6	0.0	No Limit
EA055: Moisture Content (QC Lot: 1646515)									
EM1100639-011	TP4 (0-0.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	14.3	16.6	14.8	0% - 50%
EM1100639-023	TP7 (0.3-0.4)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.7	11.7	0.0	0% - 50%
EA055: Moisture Content (QC Lot: 1646516)									
EM1100639-033	TP10 (1-1.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.1	10.2	11.6	0% - 50%
EM1100640-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.3	17.0	4.4	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1643979)									
EM1100574-002	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	120	180	42.2	No Limit
EM1100574-014	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	2630	2270	14.5	0% - 20%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1643980)									
EM1100639-027	TP8 (0.6-0.7)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	90	60	34.7	No Limit
EM1100640-034	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	2900	2760	4.8	0% - 20%
ED040T : Total Sulfate by ICPAES (QC Lot: 1643988)									
EM1100639-024	TP7 (1.75-1.8)	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	16200	17800	9.4	0% - 20%
EM1100640-033	Anonymous	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	3130	3280	4.7	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 1647556)									
EM1100639-024	TP7 (1.75-1.8)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	1.05	1.03	1.2	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1646552)									
EM1100583-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	28	26	5.8	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	18	15	16.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	29	33	13.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	142	121	16.0	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	72	63	12.7	0% - 50%
EM1100639-001	TP1 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	6	23.3	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	17	17	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	5	6	25.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	10	56.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	17	24	37.2	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1646554)									
EM1100639-013	TP4 (0.5)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	10	12.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	21	19	11.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	14	15	9.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	31	31	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	446	462	3.5	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	257	280	8.4	0% - 20%
EM1100639-026	TP8 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	29	24	16.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	47	43	8.6	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	113	114	1.1	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	222	211	5.0	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	132	128	2.5	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646553)									
EM1100583-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.2	0.0	No Limit
EM1100639-001	TP1 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646555)									
EM1100639-013	TP4 (0.5)	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.6	0.3	72.5	No Limit
EM1100639-026	TP8 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1643985)									
EM1100574-002	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EM1100574-014	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	2	2	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1643986)									
EM1100639-023	TP7 (0.3-0.4)	EK026G: Total Cyanide	57-12-5	1	mg/kg	176	191	8.3	0% - 20%
EM1100640-008	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	20	20	0.0	0% - 20%
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646609)									
EM1100639-001	TP1 (0-0.1)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646609) - continued									
EM1100639-012	TP4 (0.25-0.3)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646618)									
EM1100639-024	TP7 (1.75-1.8)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	68.7	66.2	3.7	0% - 20%
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	101	100	0.2	0% - 20%
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	169	194	13.5	0% - 20%
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	222	200	10.3	0% - 20%
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100639-034	TP11 (0-0.2)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646609)									
EM1100639-001	TP1 (0-0.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646609) - continued									
EM1100639-001	TP1 (0-0.1)	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100639-012	TP4 (0.25-0.3)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.7	<0.5	39.9	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.7	0.7	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	3.5	2.0	55.6	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	3.8	4.0	4.1	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	4.6	4.3	7.4	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.5	2.0	27.9	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.7	2.0	14.7	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.7	2.0	13.8	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.3	1.8	28.7	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.3	2.7	15.8	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	1.2	1.3	12.4	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	1.8	1.9	6.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646618)									
EM1100639-024	TP7 (1.75-1.8)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	2440	2480	1.4	0% - 20%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	473	485	2.5	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	161	242	# 40.3	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	948	1420	# 39.8	0% - 20%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2370	2370	0.06	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	889	923	3.7	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1600	1540	4.2	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646618) - continued									
EM1100639-024	TP7 (1.75-1.8)	EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1490	1460	2.4	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	644	610	5.3	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	530	519	2.0	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	424	506	17.6	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	402	480	17.8	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	570	707	# 21.5	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	219	264	18.4	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	73.5	92.3	# 22.7	0% - 20%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	252	299	17.0	0% - 20%
EM1100639-034	TP11 (0-0.2)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.8	0.5	42.8	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.7	<0.5	35.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1643995)									
EM1100639-001	TP1 (0-0.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100639-012	TP4 (0.25-0.3)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1644000)									
EM1100639-024	TP7 (1.75-1.8)	EP080: C6 - C9 Fraction	----	10	mg/kg	76	66	13.2	No Limit
EM1100639-034	TP11 (0-0.2)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646608)									
EM1100639-001	TP1 (0-0.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1100639-012	TP4 (0.25-0.3)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646617)									

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646617) - continued									
EM1100639-024	TP7 (1.75-1.8)	EP071: C15 - C28 Fraction	----	100	mg/kg	37200	27600	# 29.5	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	13200	10100	26.2	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	9080	6340	35.5	0% - 20%
EM1100639-034	TP11 (0-0.2)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1643995)									
EM1100639-001	TP1 (0-0.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100639-012	TP4 (0.25-0.3)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1644000)									
EM1100639-024	TP7 (1.75-1.8)	EP080: Benzene	71-43-2	0.2	mg/kg	23.8	19.7	18.8	0% - 20%
		EP080: Toluene	108-88-3	0.5	mg/kg	19.9	16.8	16.9	0% - 20%
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	3.4	3.4	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	18.2	16.6	8.7	0% - 20%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	7.6	7.2	4.6	0% - 50%
EM1100639-034	TP11 (0-0.2)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643979)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	111	85	125
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	106	85	125
ED040T : Total Sulfate by ICPAES (QCLot: 1643988)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	83.9	81	123
ED042T: Total Sulfur by LECO (QCLot: 1647556)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	101	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646552)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	96.8	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	95.5	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	86.6	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	88.4	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	94.1	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	88.9	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	90.6	76	120
EG005T: Total Metals by ICP-AES (QCLot: 1646554)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	101	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	96.0	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	93.9	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	96.7	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	100	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	96.0	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	96.3	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646553)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	88.7	71.9	119
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646555)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	95.7	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643985)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	112	87	123
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	116	87	123
EP075(SIM)A: Phenolic Compounds (QCLot: 1646609)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	94.4	63	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646609) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	93.8	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	94.8	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	95.9	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	95.7	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	91.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	100	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	94.3	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	96.8	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	96.6	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	94.6	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	67.7	10.4	114
EP075(SIM)A: Phenolic Compounds (QCLot: 1646618)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	94.3	63	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	93.4	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	105	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	94.1	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	91.6	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	90.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	93.2	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	90.6	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	92.1	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	82.8	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	86.0	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	67.5	10.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646609)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	97.3	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	101	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	96.6	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	98.4	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	97.1	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	103	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	92.4	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	91.8	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	83.2	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	85.9	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	92.2	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	98.3	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	97.7	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	100	59	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646609) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	99.0	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	106	59	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646618)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	110	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	106	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.3	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	102	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	# 124	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	112	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	119	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	116	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	104	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	99.3	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	94.2	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	83.4	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	96.8	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	84.8	59	125
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	84.8	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	88.6	59	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643995)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	95.1	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644000)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	104	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646608)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	77.0	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	84.5	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	83.2	63	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646617)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	68.4	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	76.3	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	74.7	63	143
EP080: BTEX (QCLot: 1643995)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	85.5	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	91.8	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	91.9	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	103	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	97.6	72	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEX (QCLot: 1644000)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	101	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	106	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	102	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	112	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	108	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643979)							
EM1100574-004	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	121	70	130
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)							
EM1100639-036	TP11 (1.2-1.3)	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	92.6	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646552)							
EM1100583-002	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	110	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	106	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	119	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	116	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	121	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	124	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	127	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646554)							
EM1100639-014	TP5 (0-0.1)	EG005T: Arsenic	7440-38-2	50 mg/kg	112	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	127	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	121	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	122	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	121	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	124	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	117	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646553)							
EM1100583-002	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	82.0	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646555)							
EM1100639-014	TP5 (0-0.1)	EG035T: Mercury	7439-97-6	5.0 mg/kg	80.3	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643985)							
EM1100574-004	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	110	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)							
EM1100639-024	TP7 (1.75-1.8)	EK026G: Total Cyanide	57-12-5	20 mg/kg	# Not Determined	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1646609)							
EM1100639-003	TP1 (0.3-0.35)	EP075(SIM): Phenol	108-95-2	10 mg/kg	98.8	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	99.7	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	93.2	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	95.1	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 44.4	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646618)							
EM1100639-026	TP8 (0-0.1)	EP075(SIM): Phenol	108-95-2	10 mg/kg	95.9	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	81.2	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	85.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 45.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646609)							
EM1100639-003	TP1 (0.3-0.35)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.2	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646618)							
EM1100639-026	TP8 (0-0.1)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643995)							
EM1100639-002	TP1 (0.35-0.4)	EP080: C6 - C9 Fraction	----	28 mg/kg	114	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644000)							
EM1100639-025	TP7 (2.9-3)	EP080: C6 - C9 Fraction	----	28 mg/kg	109	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646608)							
EM1100639-002	TP1 (0.35-0.4)	EP071: C10 - C14 Fraction	----	636 mg/kg	79.9	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	95.8	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	127	60	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646617)							
EM1100639-025	TP7 (2.9-3)	EP071: C10 - C14 Fraction	----	636 mg/kg	67.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	79.3	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	79.1	60	130
EP080: BTEX (QCLot: 1643995)							
EM1100639-002	TP1 (0.35-0.4)	EP080: Benzene	71-43-2	2 mg/kg	109	70	130
		EP080: Toluene	108-88-3	2 mg/kg	116	70	130
EP080: BTEX (QCLot: 1644000)							
EM1100639-025	TP7 (2.9-3)	EP080: Benzene	71-43-2	2 mg/kg	123	70	130
		EP080: Toluene	108-88-3	2 mg/kg	124	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100639**	Page	: 1 of 12
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 03-NOV-2011
Order number	: 210074		
		No. of samples received	: 36
Quote number	: ME/015/11 V3	No. of samples analysed	: 33

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**----**	----	----	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP11 (1.2-1.3)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Pulp Bag							
TP11 (1.2-1.3)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	17-JUL-2011	✓	**28-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**28-JAN-2011**	18-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	15-FEB-2011	✓	**31-JAN-2011**	15-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP1 (0.3-0.35), TP2 (0-0.1), TP3 (0.3), TP4 (0.25-0.3), TP6 (0.25-0.3), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP10 (1-1.1), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	6	60	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	4	32	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Acenaphthene**	83-32-9	40.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Fluorene**	86-73-7	39.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Benzo(a)pyrene**	50-32-8	21.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Dibenz(a.h)anthracene**	53-70-3	22.7 %	0-20%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**C15 - C28 Fraction**	----	29.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1933149-005	----	**Phenanthrene**	85-01-8	124 %	68-120%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	TP7 (1.75-1.8)	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)A: Phenolic Compounds	EM1100639-003	TP1 (0.3-0.35)	**Pentachlorophenol**	87-86-5	44.4 %	70-130%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	EM1100639-026	TP8 (0-0.1)	**Pentachlorophenol**	87-86-5	45.4 %	70-130%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM1100639-024	TP7 (1.75-1.8)	**4-Bromofluorobenzene**	460-00-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1100640**	Page	: 1 of 14
Amendment	: **2**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 04-NOV-2011
Order number	: 210074		
		No. of samples received	: 37
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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*
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Xingbin Lin	Senior Organic Chemist	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1646516)									
EM1100639-033	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.1	10.2	11.6	0% - 50%
EM1100640-008	TP13 (0.8-0.85)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.3	17.0	4.4	0% - 50%
EA055: Moisture Content (QC Lot: 1646517)									
EM1100640-020	TP16 (1-1.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	26.1	26.4	0.9	0% - 20%
EM1100640-031	TP19 (0.6-0.7)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.0	10.4	5.2	0% - 50%
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1643980)									
EM1100639-027	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	90	60	34.7	No Limit
EM1100640-034	TP20 (0.8-0.9)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	2900	2760	4.8	0% - 20%
ED040T : Total Sulfate by ICPAES (QC Lot: 1643988)									
EM1100639-024	Anonymous	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	16200	17800	9.4	0% - 20%
EM1100640-033	TP20 (0.6-0.7)	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	3130	3280	4.7	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 1647557)									
EM1100640-001	TP11 (2-2.1)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.08	0.07	0.0	No Limit
EM1100640-036	TP21 (0.45-0.5)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1646548)									
EM1100590-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	11	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	68	69	1.9	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	18	9.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	8	41.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	32	34	8.5	No Limit
EM1100590-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	2	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	144	133	8.1	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	44	49	10.2	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	6	17.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	186	195	4.7	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	335	350	4.5	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	3250	2800	14.8	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1646550)									
EM1100640-014	TP15 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	12	11.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	6	35.5	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1646550) - continued									
EM1100640-014	TP15 (0-0.1)	EG005T: Copper	7440-50-8	5	mg/kg	25	24	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	125	104	18.1	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	132	113	16.0	0% - 20%
EM1100640-026	TP18 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	10	11	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	30	33	9.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	52	53	2.9	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646549)									
EM1100590-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100590-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.2	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646551)									
EM1100640-014	TP15 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.0	No Limit
EM1100640-026	TP18 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1643986)									
EM1100639-023	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	176	191	8.3	0% - 20%
EM1100640-008	TP13 (0.8-0.85)	EK026G: Total Cyanide	57-12-5	1	mg/kg	20	20	0.0	0% - 20%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1645201)									
EM1100584-009	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	1	1	0.0	No Limit
EM1100641-010	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	2	3	0.0	No Limit
EK055: Ammonia as N (QC Lot: 1648900)									
EM1100562-001	Anonymous	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646620)									
EM1100640-001	TP11 (2-2.1)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100640-014	TP15 (0-0.1)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646620) - continued									
EM1100640-014	TP15 (0-0.1)	EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646631)									
EM1100632-006	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100640-029	TP19 (0-0.1)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646620)									
EM1100640-001	TP11 (2-2.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	1.7	1.2	34.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646620) - continued									
EM1100640-001	TP11 (2-2.1)	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.9	1.7	9.3	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	4.4	4.0	9.9	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.6	1.3	19.5	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	3.9	3.6	9.7	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	4.0	3.6	9.3	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.7	1.5	9.6	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.2	1.1	10.2	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.6	1.6	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.7	0.6	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.5	1.4	8.9	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.6	0.6	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.8	0.8	0.0	No Limit
EM1100640-014	TP15 (0-0.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.5	0.6	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1.2	1.1	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1.2	1.2	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.6	0.6	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.7	0.6	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646631)									
EM1100632-006	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	1.5	<0.5	98.5	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.5	0.8	106	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.1	0.6	112	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	0.6	<0.5	21.5	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646631) - continued									
EM1100632-006	Anonymous	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.7	<0.5	32.7	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100640-029	TP19 (0-0.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1643999)									
EM1100640-001	TP11 (2-2.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100640-014	TP15 (0-0.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1644001)									
EM1100632-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100640-029	TP19 (0-0.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646619)									
EM1100640-001	TP11 (2-2.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1100640-014	TP15 (0-0.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646630)									
EM1100632-006	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2200	2190	0.0	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	3320	3200	3.5	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646630) - continued									
EM1100632-006	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	70	60	0.0	No Limit
EM1100640-029	TP19 (0-0.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1643999)									
EM1100640-001	TP11 (2-2.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100640-014	TP15 (0-0.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1644001)									
EM1100632-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100640-029	TP19 (0-0.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	106	85	125
ED040T : Total Sulfate by ICPAES (QCLot: 1643988)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	83.9	81	123
ED042T: Total Sulfur by LECO (QCLot: 1647557)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	99.4	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646548)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	92.1	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	94.0	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	89.5	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	79.8	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	79.3	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	98.1	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	97.7	76	120
EG005T: Total Metals by ICP-AES (QCLot: 1646550)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	82.6	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	94.6	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	78.9	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	84.3	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	85.1	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	79.8	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	80.3	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646549)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	88.6	71.9	119
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646551)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	86.6	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	116	87	123
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1645201)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	114	87	123
EK055: Ammonia as N (QCLot: 1648900)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	25 mg/kg	98.0	91	109
EP075(SIM)A: Phenolic Compounds (QCLot: 1646620)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	101	63	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646620) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	97.1	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	98.4	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	100	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	84.7	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	98.8	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	101	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	95.7	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	100	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	100	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	89.3	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	33.8	10.4	114
EP075(SIM)A: Phenolic Compounds (QCLot: 1646631)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	98.9	63	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	97.1	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	100	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	101	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	81.4	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	101	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	102	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	99.4	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	101	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	98.4	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	98.2	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	62.4	10.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646620)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	98.2	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	99.4	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.9	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	99.0	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	95.9	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	95.4	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	93.0	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	93.2	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	99.3	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	91.1	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	106	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	94.5	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	99.5	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	86.8	59	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646620) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	85.9	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	87.9	59	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646631)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	100	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	102	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.9	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	96.6	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	98.7	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	108	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	99.8	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	101	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	98.7	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	98.9	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	104	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	107	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	109	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	99.3	59	125
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	100	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	101	59	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643999)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	96.3	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644001)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	112	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646619)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	69.7	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	80.2	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	85.1	63	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646630)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	81.4	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	90.4	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	90.3	63	143
EP080: BTEX (QCLot: 1643999)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	88.8	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	91.4	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	90.3	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	101	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	96.5	72	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEX (QCLot: 1644001)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	108	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	114	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	114	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	128	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	121	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)							
EM1100639-036	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	92.6	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646548)							
EM1100590-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	86.8	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	86.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	82.5	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	93.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	72.3	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	92.5	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646550)							
EM1100640-015	TP15 (0.5-0.6)	EG005T: Arsenic	7440-38-2	50 mg/kg	104	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	88.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	77.0	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	87.8	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	90.0	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	78.6	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	88.3	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646549)							
EM1100590-003	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	83.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646551)							
EM1100640-015	TP15 (0.5-0.6)	EG035T: Mercury	7439-97-6	5.0 mg/kg	84.6	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)							
EM1100639-024	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	# Not Determined	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1645201)							
EM1100640-023	TP17 (0.3-0.4)	EK026G: Total Cyanide	57-12-5	20 mg/kg	114	70	130
EK055: Ammonia as N (QCLot: 1648900)							
EM1100637-007	Anonymous	EK055: Ammonia as N	7664-41-7	100 mg/kg	90.2	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1646620)							
EM1100640-003	TP12 (0.2-0.3)	EP075(SIM): Phenol	108-95-2	10 mg/kg	104	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	99.6	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	96.1	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	102	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	103	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646631)							
EM1100640-024	TP17 (1.0-1.1)	EP075(SIM): Phenol	108-95-2	10 mg/kg	101	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	100	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	77.4	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	102	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	124	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646620)							
EM1100640-003	TP12 (0.2-0.3)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	94.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	# 47.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646631)							
EM1100640-024	TP17 (1.0-1.1)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	89.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	# Not Determined	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643999)							
EM1100640-002	TP12 (0-0.1)	EP080: C6 - C9 Fraction	----	28 mg/kg	87.1	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644001)							
EM1100632-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	124	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646619)							
EM1100640-002	TP12 (0-0.1)	EP071: C10 - C14 Fraction	----	636 mg/kg	71.9	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	84.5	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	98.8	60	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646630)							
EM1100632-002	Anonymous	EP071: C10 - C14 Fraction	----	636 mg/kg	84.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	90.8	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	# Not Determined	60	130
EP080: BTEX (QCLot: 1643999)							
EM1100640-002	TP12 (0-0.1)	EP080: Benzene	71-43-2	2 mg/kg	96.6	70	130
		EP080: Toluene	108-88-3	2 mg/kg	96.3	70	130
EP080: BTEX (QCLot: 1644001)							
EM1100632-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	# 146	70	130
		EP080: Toluene	108-88-3	2 mg/kg	# 146	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100640**	Page	: 1 of 13
Amendment	: **2**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 04-NOV-2011
Order number	: 210074		
		No. of samples received	: 37
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0-0.1), TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0-0.1), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP14 (0.85-0.9), TP15 (0-0.1), TP15 (0.5-0.6), TP15 (1-1.1), TP15 (2.4-2.5), TP16 (0.05-0.15), TP16 (0.4-0.5), TP16 (1-1.1), TP16 (2-2.1)	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0-0.1), TP17 (0.3-0.4), TP17 (1.0-1.1), TP18 (0-0.1), TP18 (0.25-0.3), TP18 (0.7-0.8), TP19 (0-0.1), TP19 (0.3-0.4), TP19 (0.6-0.7), TP20 (0.1-0.2), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**----**	----	----	**27-JAN-2011**	03-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0.2-0.3), TP15 (0-0.1), TP16 (0.05-0.15)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP18 (0.25-0.3), TP18 (0.7-0.8), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0.2-0.3), TP15 (0-0.1), TP16 (0.05-0.15)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP18 (0.25-0.3), TP18 (0.7-0.8), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO								
Pulp Bag								
TP11 (2-2.1),	TP12 (0.2-0.3),	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
TP15 (0-0.1),	TP16 (0.05-0.15)							
Pulp Bag								
TP18 (0.25-0.3),	TP18 (0.7-0.8),	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**28-JAN-2011**	18-JUL-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP16 (0.05-0.15),							
TP16 (0.4-0.5),	TP16 (1-1.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	19-JUL-2011	✓	**28-JAN-2011**	19-JUL-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP16 (0.05-0.15),							
TP16 (0.4-0.5),	TP16 (1-1.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	17-FEB-2011	✓	**31-JAN-2011**	17-FEB-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP15 (0.5-0.6), TP16 (1-1.1)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0.3-0.4), TP18 (0.25-0.3), TP19 (0.6-0.7), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0.45-0.5)	**20-JAN-2011**	**27-JAN-2011**	27-JAN-2011	✓	**28-JAN-2011**	10-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
TP20 (0.8-0.9)	**20-JAN-2011**	**----**	----	----	**28-JAN-2011**	19-JUL-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0-0.1), TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0-0.1), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP14 (0.85-0.9), TP15 (0-0.1), TP15 (0.5-0.6), TP15 (1-1.1), TP16 (0.05-0.15), TP16 (0.4-0.5), TP16 (1-1.1)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0-0.1), TP17 (0.3-0.4), TP17 (1.0-1.1), TP18 (0-0.1), TP18 (0.25-0.3), TP18 (0.7-0.8), TP19 (0-0.1), TP19 (0.3-0.4), TP19 (0.6-0.7), TP20 (0.1-0.2), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	Anonymous	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100640-024	TP17 (1.0-1.1)	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100640-003	TP12 (0.2-0.3)	**Pyrene**	129-00-0	47.0 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100632-002	Anonymous	**C29 - C36 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080: BTEX	EM1100632-002	Anonymous	**Benzene**	71-43-2	146 %	70-130%	**Recovery greater than upper data quality objective**
EP080: BTEX	EM1100632-002	Anonymous	**Toluene**	108-88-3	146 %	70-130%	**Recovery greater than upper 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.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1100641**	Page	: 1 of 17
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 32
Quote number	: ME/015/11 V3	No. of samples analysed	: 30

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1646517)									
EM1100640-020	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	26.1	26.4	0.9	0% - 20%
EM1100640-031	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.0	10.4	5.2	0% - 50%
EA055: Moisture Content (QC Lot: 1646518)									
EM1100641-005	TP22 (2.4-2.5)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.1	19.9	1.0	0% - 50%
EM1100641-016	TP26 (0-0.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	3.4	5.0	39.0	No Limit
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1643980)									
EM1100639-027	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	90	60	34.7	No Limit
EM1100640-034	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	2900	2760	4.8	0% - 20%
ED040T : Total Sulfate by ICPAES (QC Lot: 1643988)									
EM1100639-024	Anonymous	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	16200	17800	9.4	0% - 20%
EM1100640-033	Anonymous	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	3130	3280	4.7	0% - 20%
ED042T: Total Sulfur by LECO (QC Lot: 1647558)									
EM1100641-017	TP26 (0.5-0.6)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.04	0.05	24.7	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1646556)									
EM1100622-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	10	29.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EM1100641-006	TP23 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	19	20	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	18.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	<5	24.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	18	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1646558)									
EM1100641-018	TP26 (1.8-1.9)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	5	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	4	32.4	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1646558) - continued									
EM1100641-018	TP26 (1.8-1.9)	EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EM1100647-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	10	10.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	30	25	15.9	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	10	15.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	20	19.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	106	93	13.4	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	110	99	10.7	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646557)									
EM1100622-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100641-006	TP23 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1646559)									
EM1100641-018	TP26 (1.8-1.9)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100647-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.3	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1643986)									
EM1100639-023	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	176	191	8.3	0% - 20%
EM1100640-008	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	20	20	0.0	0% - 20%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1645201)									
EM1100584-009	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	1	1	0.0	No Limit
EM1100641-010	TP24 (0.5-0.6)	EK026G: Total Cyanide	57-12-5	1	mg/kg	2	3	0.0	No Limit
EK055: Ammonia as N (QC Lot: 1648900)									
EM1100562-001	Anonymous	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646611)									
EM1100641-004	TP22 (0.6-0.7)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100641-011	TP24 (1.1-1.2)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	1.3	1.7	28.2	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	0.9	1.3	35.2	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646611) - continued									
EM1100641-011	TP24 (1.1-1.2)	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	1.2	1.8	37.8	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	2.3	3.3	35.2	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1646618)									
EM1100639-024	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	68.7	66.2	3.7	0% - 20%
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	101	100	0.2	0% - 20%
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	169	194	13.5	0% - 20%
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	222	200	10.3	0% - 20%
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100639-034	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646611)									
EM1100641-004	TP22 (0.6-0.7)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.9	3.2	114	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	2.5	3.5	33.5	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.1	2.2	67.4	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646611) - continued									
EM1100641-004	TP22 (0.6-0.7)	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	13.4	17.0	# 23.2	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	4.5	5.2	14.6	0% - 50%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	25.4	30.8	19.0	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	24.8	26.1	5.2	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	15.1	10.8	# 33.3	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	13.6	9.3	# 37.3	0% - 50%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	14.7	5.8	# 86.2	0% - 50%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	14.0	8.9	# 44.4	0% - 50%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	17.5	8.0	# 74.5	0% - 50%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	8.1	3.7	# 73.6	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	2.7	1.1	82.2	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	8.8	4.0	# 74.1	No Limit
EM1100641-011	TP24 (1.1-1.2)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	5.8	9.5	47.6	0% - 50%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	45.5	61.2	# 29.3	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	3.0	4.7	45.8	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	260	418	# 46.5	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	108	155	# 35.4	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	538	768	# 35.3	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	520	741	# 35.1	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	242	309	# 24.6	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	211	309	# 37.7	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	147	241	# 48.2	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	177	210	17.0	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	161	238	# 38.3	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	38.4	42.0	8.9	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	13.5	15.8	15.6	0% - 20%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	35.4	37.8	6.5	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646618)									
EM1100639-024	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	2440	2480	1.4	0% - 20%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	473	485	2.5	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	161	242	# 40.3	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	948	1420	# 39.8	0% - 20%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2370	2370	0.06	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	889	923	3.7	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	1600	1540	4.2	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	1490	1460	2.4	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	644	610	5.3	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	530	519	2.0	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1646618) - continued									
EM1100639-024	Anonymous	EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	424	506	17.6	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	402	480	17.8	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	570	707	# 21.5	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	219	264	18.4	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	73.5	92.3	# 22.7	0% - 20%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	252	299	17.0	0% - 20%
EM1100639-034	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.8	0.5	42.8	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.7	<0.5	35.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1643998)									
EM1100641-001	TP21 (0.8-0.9)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100641-011	TP24 (1.1-1.2)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1644000)									
EM1100639-024	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	76	66	13.2	No Limit
EM1100639-034	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646610)									
EM1100641-004	TP22 (0.6-0.7)	EP071: C15 - C28 Fraction	----	100	mg/kg	260	350	27.8	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	280	340	19.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1100641-011	TP24 (1.1-1.2)	EP071: C15 - C28 Fraction	----	100	mg/kg	5760	5540	4.0	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	3640	3950	8.3	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646617)									
EM1100639-024	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	37200	27600	# 29.5	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	13200	10100	26.2	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	9080	6340	35.5	0% - 20%

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1646617) - continued									
EM1100639-034	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1643998)									
EM1100641-001	TP21 (0.8-0.9)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100641-011	TP24 (1.1-1.2)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1644000)									
EM1100639-024	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	23.8	19.7	18.8	0% - 20%
		EP080: Toluene	108-88-3	0.5	mg/kg	19.9	16.8	16.9	0% - 20%
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	3.4	3.4	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	18.2	16.6	8.7	0% - 20%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	7.6	7.2	4.6	0% - 50%
EM1100639-034	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1646773)									
EM1100627-005	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	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: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.013	0.015	11.0	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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1646773) - continued									
EM1100628-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0005	0.0004	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.003	50.3	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.009	0.009	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1646772)									
EM1100591-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	0.0007	0.0007	0.0	No Limit
EM1100641-020	Rinsate (1)	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1644346)									
EM1100618-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EM1100631-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1644346)									
EM1100618-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
EM1100631-005	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	106	85	125
ED040T : Total Sulfate by ICPAES (QCLot: 1643988)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	83.9	81	123
ED042T: Total Sulfur by LECO (QCLot: 1647558)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	99.4	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646556)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	81.0	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	95.5	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	97.2	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	97.8	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	98.1	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	97.6	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	102	76	120
EG005T: Total Metals by ICP-AES (QCLot: 1646558)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	83.8	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	95.7	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	97.2	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	97.8	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	98.3	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	97.7	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	102	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646557)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	99.5	71.9	119
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646559)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	98.6	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	116	87	123
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1645201)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	114	87	123
EK055: Ammonia as N (QCLot: 1648900)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	25 mg/kg	98.0	91	109
EP075(SIM)A: Phenolic Compounds (QCLot: 1646611)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	102	63	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646611) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	100	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	103	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	102	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	101	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	101	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	103	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	96.8	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	99.5	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	97.7	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	97.0	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	88.0	10.4	114
EP075(SIM)A: Phenolic Compounds (QCLot: 1646618)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	94.3	63	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	93.4	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	105	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	94.1	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	91.6	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	90.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	93.2	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	90.6	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	92.1	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	82.8	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	86.0	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	67.5	10.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646611)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	99.5	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	102	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	98.6	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	98.9	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	98.8	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	105	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	103	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	102	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	103	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	102	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	93.4	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	104	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	97.7	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	80.4	59	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646611) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	82.2	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	75.6	59	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646618)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	110	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	106	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.3	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	102	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	# 124	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	112	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	119	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	116	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	104	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	99.3	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	94.2	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	83.4	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	96.8	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	84.8	59	125
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	84.8	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	88.6	59	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643998)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	106	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644000)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	104	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646610)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	76.5	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	94.1	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	122	63	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646617)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	68.4	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	76.3	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	74.7	63	143
EP080: BTEX (QCLot: 1643998)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	93.8	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	104	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	104	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	116	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	113	72	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEX (QCLot: 1644000)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	101	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	106	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	102	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	112	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	108	72	124

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1646773)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.5	86	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	87	109
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.6	85	109
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.6	86	110
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.8	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	86	110
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	109	88	120
EG035F: Dissolved Mercury by FIMS (QCLot: 1646772)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.0100 mg/L	101	76	124
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1644863)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	91.0	38	126
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	82.3	35	133
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	84.0	41	127
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	82.1	42	128
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	88.7	45	131
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	91.0	47	129
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	87.7	42	132
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	91.3	42	132
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	88.6	30.8	145
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	88.0	30.7	139
EP075(SIM): Benzo(b)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	96.1	40	144
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	85.5	44	136
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	87.8	43	135
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	78.8	47	149
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	78.8	47	151
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	79.3	47	151
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644346)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	320 µg/L	115	71	131

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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644862)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	798 µg/L	82.7	64	124
EP071: C15 - C28 Fraction	----	100	µg/L	<100	804 µg/L	77.9	70	130
EP071: C29 - C36 Fraction	----	50	µg/L	<50	800 µg/L	84.5	68	128
EP080: BTEX (QCLot: 1644346)								
EP080: Benzene	71-43-2	1	µg/L	<1	20 µg/L	121	71	131
EP080: Toluene	108-88-3	2	µg/L	<2	20 µg/L	122	70	130
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	20 µg/L	121	70	130
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	40 µg/L	120	69	129
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	20 µg/L	120	70	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: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1643980)							
EM1100639-036	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	92.6	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646556)							
EM1100630-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	75.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	112	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	86.8	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	74.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	95.8	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1646558)							
EM1100641-019	TP26 (2.5-2.6)	EG005T: Arsenic	7440-38-2	50 mg/kg	90.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	81.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	84.9	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	86.2	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	85.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	81.5	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	86.3	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646557)							
EM1100630-001	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	83.8	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1646559)							
EM1100641-019	TP26 (2.5-2.6)	EG035T: Mercury	7439-97-6	5.0 mg/kg	87.4	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1643986)							
EM1100639-024	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	# Not Determined	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1645201)							
EM1100640-023	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	114	70	130
EK055: Ammonia as N (QCLot: 1648900)							
EM1100637-007	Anonymous	EK055: Ammonia as N	7664-41-7	100 mg/kg	90.2	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1646611)							
EM1100641-003	TP22 (0.3-0.4)	EP075(SIM): Phenol	108-95-2	10 mg/kg	103	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	102	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	104	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	96.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	71.1	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 1646618)							
EM1100639-026	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	95.9	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.5	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	81.2	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	85.8	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 45.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646611)							
EM1100641-003	TP22 (0.3-0.4)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	97.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	92.3	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1646618)							
EM1100639-026	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1643998)							
EM1100641-002	TP22 (0-0.1)	EP080: C6 - C9 Fraction	----	28 mg/kg	97.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644000)							
EM1100639-025	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	109	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646610)							
EM1100641-002	TP22 (0-0.1)	EP071: C10 - C14 Fraction	----	636 mg/kg	71.0	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	77.8	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	88.1	60	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1646617)							
EM1100639-025	Anonymous	EP071: C10 - C14 Fraction	----	636 mg/kg	67.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	79.3	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	79.1	60	130
EP080: BTEX (QCLot: 1643998)							
EM1100641-002	TP22 (0-0.1)	EP080: Benzene	71-43-2	2 mg/kg	93.7	70	130
		EP080: Toluene	108-88-3	2 mg/kg	105	70	130
EP080: BTEX (QCLot: 1644000)							
EM1100639-025	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	123	70	130
		EP080: Toluene	108-88-3	2 mg/kg	124	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Spike Recovery (%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1646773)							
EM1100627-005	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	124	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	101	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	90.7	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1646773) - continued							
EM1100627-005	Anonymous	EG020A-F: Copper	7440-50-8	0.2 mg/L	99.1	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	89.8	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	99.4	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	95.4	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1646772)							
EM1100591-005	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	91.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1644346)							
EM1100618-002	Anonymous	EP080: C6 - C9 Fraction	----	280 µg/L	72.4	70	130
EP080: BTEX (QCLot: 1644346)							
EM1100618-002	Anonymous	EP080: Benzene	71-43-2	20 µg/L	88.9	70	130
		EP080: Toluene	108-88-3	20 µg/L	90.6	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100641**	Page	: 1 of 14
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 32
Quote number	: ME/015/11 V3	No. of samples analysed	: 30

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**----**	----	----	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**----**	----	----	**27-JAN-2011**	03-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved DUP2	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved DUP2	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
ED042T: Total Sulfur by LECO							
Pulp Bag DUP2	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Pulp Bag TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	17-JUL-2011	✓	**31-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**31-JAN-2011**	18-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	19-JUL-2011	✓	**31-JAN-2011**	19-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	15-FEB-2011	✓	**31-JAN-2011**	15-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	17-FEB-2011	✓	**31-JAN-2011**	17-FEB-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP22 (0.3-0.4), TP23 (0.4-0.5), TP24 (0.5-0.6), TP25 (0.7-0.8), TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	27-JAN-2011	✓	**28-JAN-2011**	10-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
TP25 (0.7-0.8), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**----**	----	----	**28-JAN-2011**	19-JUL-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓

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 - Natural Rinsate (1)	**18-JAN-2011**	**---**	17-JUL-2011	----	**28-JAN-2011**	17-JUL-2011	✓
Clear Plastic Bottle - Natural Rinsate (2)	**19-JAN-2011**	**---**	18-JUL-2011	----	**28-JAN-2011**	18-JUL-2011	✓
Clear Plastic Bottle - Natural Rinsate (3)	**20-JAN-2011**	**---**	19-JUL-2011	----	**28-JAN-2011**	19-JUL-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural Rinsate (1)	**18-JAN-2011**	**---**	15-FEB-2011	----	**31-JAN-2011**	15-FEB-2011	✓
Clear Plastic Bottle - Natural Rinsate (2)	**19-JAN-2011**	**---**	16-FEB-2011	----	**31-JAN-2011**	16-FEB-2011	✓
Clear Plastic Bottle - Natural Rinsate (3)	**20-JAN-2011**	**---**	17-FEB-2011	----	**31-JAN-2011**	17-FEB-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved Rinsate (2)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved Rinsate (2)		**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)		**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved Rinsate (2)		**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)		**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
EP080: BTEX								
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
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
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (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)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 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) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Acenaphthylene**	208-96-8	29.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Acenaphthene**	83-32-9	40.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Fluorene**	86-73-7	39.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Phenanthrene**	85-01-8	46.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Phenanthrene**	85-01-8	23.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Anthracene**	120-12-7	35.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Fluoranthene**	206-44-0	35.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Pyrene**	129-00-0	35.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benz(a)anthracene**	56-55-3	24.6 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benz(a)anthracene**	56-55-3	33.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Chrysene**	218-01-9	37.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Chrysene**	218-01-9	37.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benzo(b)fluoranthene**	205-99-2	48.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(b)fluoranthene**	205-99-2	86.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(k)fluoranthene**	207-08-9	44.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(a)pyrene**	50-32-8	74.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benzo(a)pyrene**	50-32-8	38.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Benzo(a)pyrene**	50-32-8	21.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Indeno(1.2.3.cd)pyrene**	193-39-5	73.6 %	0-50%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Dibenz(a.h)anthracene**	53-70-3	22.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(g.h.i)perylene**	191-24-2	74.1 %	0-50%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1100639-024	Anonymous	**C15 - C28 Fraction**	----	29.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1933149-005	----	**Phenanthrene**	85-01-8	124 %	68-120%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	Anonymous	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)A: Phenolic Compounds	EM1100639-026	Anonymous	**Pentachlorophenol**	87-86-5	45.4 %	70-130%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM1100641-024	Trip 2	**1.2-Dichloroethane-D4**	17060-07-0	126 %	77.5-124.5 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1100885**	Page	: 1 of 14
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-JAN-2011
Sampler	: JI, JF	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 35
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1652696)									
EM1100822-024	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.5	17.4	6.1	0% - 50%
EM1100885-003	BH1 (1-1.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	6.4	7.0	9.1	No Limit
EA055: Moisture Content (QC Lot: 1652697)									
EM1100885-015	BH5 (0-0.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.7	16.0	15.8	0% - 50%
EM1100885-026	BH8 (0.3-0.4)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	8.5	9.8	13.5	No Limit
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1665384)									
EM1100885-006	BH2 (0.2-0.3)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	120	130	0.0	No Limit
EM1100885-027	BH8 (1.4-1.5)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.0	No Limit
ED040T : Total Sulfate by ICPAES (QC Lot: 1652855)									
EM1100885-006	BH2 (0.2-0.3)	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	160	110	37.7	No Limit
EM1100885-027	BH8 (1.4-1.5)	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	<100	0.0	No Limit
ED042T: Total Sulfur by LECO (QC Lot: 1667541)									
EM1100885-006	BH2 (0.2-0.3)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.06	0.06	0.0	No Limit
EM1100885-027	BH8 (1.4-1.5)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	<0.01	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1655109)									
EM1100885-001	BH1 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	9	16.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	24	22	6.8	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	15	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	15	10.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	36	34	5.6	No Limit
EM1100885-012	BH4 (0-0.1)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	9	41.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	8	8	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	6	16.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	24	20	22.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	137	112	19.9	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	122	123	1.3	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1655111)									
EM1100885-023	BH7 (0.6-0.7)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	3	30.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005T: Total Metals by ICP-AES (QC Lot: 1655111) - continued									
EM1100885-023	BH7 (0.6-0.7)	EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	6	20.1	No Limit
EM1100885-033	BH14 (0.05-0.15)	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	14	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	10	38.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	26	17.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	126	104	19.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	58	60	3.6	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1655110)									
EM1100885-001	BH1 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100885-012	BH4 (0-0.1)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1655112)									
EM1100885-023	BH7 (0.6-0.7)	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100885-033	BH14 (0.05-0.15)	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1652850)									
EM1100834-110	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EM1100885-006	BH2 (0.2-0.3)	EK026G: Total Cyanide	57-12-5	1	mg/kg	11	12	0.0	0% - 50%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1652851)									
EM1100885-029	BH9 (0.9-1.0)	EK026G: Total Cyanide	57-12-5	1	mg/kg	1	1	0.0	No Limit
EK055: Ammonia as N (QC Lot: 1654084)									
EM1100878-001	Anonymous	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1655135)									
EM1100885-001	BH1 (0-0.1)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100885-013	BH4 (0.2-0.3)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1655135) - continued									
EM1100885-013	BH4 (0.2-0.3)	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1655137)									
EM1100885-023	BH7 (0.6-0.7)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	1.8	1.9	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	0.7	0.7	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	0.7	0.8	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	2.2	2.4	5.6	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100937-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655135)									
EM1100885-001	BH1 (0-0.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	0.6	<0.5	20.7	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655135) - continued									
EM1100885-001	BH1 (0-0.1)	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.1	1.6	25.6	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	0.6	16.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	3.5	3.3	6.1	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	3.2	3.0	5.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.6	1.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.3	1.3	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.9	1.8	8.1	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.7	0.8	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.5	1.4	7.1	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.7	0.7	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.8	0.8	0.0	No Limit
EM1100885-013	BH4 (0.2-0.3)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	4.1	3.7	9.8	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	2.2	3.3	38.8	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.5	1.9	20.1	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	5.2	6.6	23.2	0% - 50%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	5.3	6.4	19.3	0% - 50%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	4.8	5.2	6.5	0% - 50%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	6.6	6.8	1.7	0% - 50%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	13.2	13.1	0.0	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.2	3.6	13.7	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	3.6	3.8	5.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	4.1	3.9	5.8	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.4	1.3	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.1	3.9	5.9	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655137)									
EM1100885-023	BH7 (0.6-0.7)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	7.0	4.5	43.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	18.6	14.0	# 28.7	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	3.4	2.1	48.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	13.9	8.2	# 51.5	0% - 50%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	124	100	# 21.2	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	29.2	22.0	# 28.4	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	158	123	# 25.1	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	148	109	# 29.8	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	71.5	39.8	# 56.9	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	52.3	31.2	# 50.4	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655137) - continued									
EM1100885-023	BH7 (0.6-0.7)	EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	71.9	39.0	# 59.2	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	14.7	15.6	5.9	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	60.9	34.3	# 55.9	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	16.7	13.2	# 23.0	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	5.8	4.5	25.2	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	16.8	13.9	18.4	0% - 20%
EM1100937-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	2.4	3.0	21.8	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	2.9	2.9	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.5	1.7	13.4	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	16.3	15.4	6.1	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	4.5	4.4	3.6	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	19.9	18.1	9.4	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	18.6	16.9	9.6	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	9.9	8.7	13.0	0% - 50%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	7.8	6.8	13.9	0% - 50%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	11.4	10.1	12.5	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.2	3.3	22.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	9.2	7.8	15.8	0% - 50%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	3.9	3.3	18.3	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.3	1.1	19.7	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.3	3.6	18.8	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1652700)									
EM1100885-001	BH1 (0-0.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100885-013	BH4 (0.2-0.3)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1652714)									
EM1100885-023	BH7 (0.6-0.7)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100885-034	DUP1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1655134)									
EM1100885-001	BH1 (0-0.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	160	<100	44.2	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1100885-013	BH4 (0.2-0.3)	EP071: C15 - C28 Fraction	----	100	mg/kg	960	960	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	590	590	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	370	350	4.1	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1655136)									
EM1100885-023	BH7 (0.6-0.7)	EP071: C15 - C28 Fraction	----	100	mg/kg	260	140	62.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	200	100	64.7	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1655136) - continued									
EM1100937-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	320	110	96.5	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	240	100	79.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1652700)									
EM1100885-001	BH1 (0-0.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100885-013	BH4 (0.2-0.3)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1652714)									
EM1100885-023	BH7 (0.6-0.7)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100885-034	DUP1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1665384)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	86.6	85	125
ED040T : Total Sulfate by ICPAES (QCLot: 1652855)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	103	81	123
ED042T: Total Sulfur by LECO (QCLot: 1667541)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	96.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1655109)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	126	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	114	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	118	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	103	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	121	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	117	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	117	76	120
EG005T: Total Metals by ICP-AES (QCLot: 1655111)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	127	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	116	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	121	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	118	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	119	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	119	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	114	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655110)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	83.4	71.9	119
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655112)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	87.9	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1652850)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	110	87	123
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1652851)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	110	87	123
EK055: Ammonia as N (QCLot: 1654084)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	25 mg/kg	98.0	91	109
EP075(SIM)A: Phenolic Compounds (QCLot: 1655135)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	86.8	63	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1655135) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	86.4	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	83.6	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	80.5	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	85.5	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	84.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	87.7	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	73.1	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	77.7	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	77.2	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	85.0	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	32.1	10.4	114
EP075(SIM)A: Phenolic Compounds (QCLot: 1655137)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	79.9	63	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	88.8	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	93.2	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	92.8	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	91.1	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	92.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	92.4	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	87.1	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	89.8	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	80.6	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	88.4	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	63.0	10.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655135)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	79.6	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	81.2	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	79.0	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	78.0	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	78.5	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	81.8	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	76.7	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	77.2	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	73.5	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	77.0	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	71.9	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	86.4	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	79.5	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	74.8	59	125

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655135) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	74.3	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	77.2	59	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655137)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	89.7	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	89.4	68	120
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	87.5	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	86.8	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	86.3	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	91.4	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	87.0	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	86.2	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	88.0	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	85.9	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	81.4	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	93.1	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	87.8	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	77.8	59	125
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	78.6	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	76.6	59	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1652700)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	105	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1652714)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	102	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655134)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	84.9	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	101	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	115	63	143
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655136)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	72.0	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	89.8	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	102	63	143
EP080: BTEX (QCLot: 1652700)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	103	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	105	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	104	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	108	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	104	72	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEX (QCLot: 1652714)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	95.6	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	99.0	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	97.3	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	111	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	104	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1665384)							
EM1100885-007	BH2 (0.9-1)	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	103	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1655109)							
EM1100885-002	BH1 (0.3-0.4)	EG005T: Arsenic	7440-38-2	50 mg/kg	85.4	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	70.8	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	106	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	105	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	84.6	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	98.8	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1655111)							
EM1100885-025	BH8 (0-0.1)	EG005T: Arsenic	7440-38-2	50 mg/kg	93.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	78.6	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	113	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	80.0	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	70.3	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655110)							
EM1100885-002	BH1 (0.3-0.4)	EG035T: Mercury	7439-97-6	5.0 mg/kg	83.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655112)							
EM1100885-025	BH8 (0-0.1)	EG035T: Mercury	7439-97-6	5.0 mg/kg	81.0	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1652850)							
EM1100834-111	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	105	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1652851)							
EM1100885-032	BH13 (0.3-0.4)	EK026G: Total Cyanide	57-12-5	20 mg/kg	105	70	130
EK055: Ammonia as N (QCLot: 1654084)							
EM1100878-002	Anonymous	EK055: Ammonia as N	7664-41-7	100 mg/kg	91.0	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1655135)							
EM1100885-003	BH1 (1-1.1)	EP075(SIM): Phenol	108-95-2	10 mg/kg	86.3	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	89.3	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.6	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	77.3	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 54.3	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1655137)							
EM1100885-026	BH8 (0.3-0.4)	EP075(SIM): Phenol	108-95-2	10 mg/kg	80.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.1	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	99.2	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	84.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 46.1	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655135)							
EM1100885-003	BH1 (1-1.1)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	78.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	71.9	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655137)							
EM1100885-026	BH8 (0.3-0.4)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	84.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	124	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1652700)							
EM1100885-002	BH1 (0.3-0.4)	EP080: C6 - C9 Fraction	----	28 mg/kg	90.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1652714)							
EM1100885-025	BH8 (0-0.1)	EP080: C6 - C9 Fraction	----	28 mg/kg	107	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655134)							
EM1100885-002	BH1 (0.3-0.4)	EP071: C10 - C14 Fraction	----	636 mg/kg	64.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	# 55.2	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	# 48.0	60	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655136)							
EM1100885-025	BH8 (0-0.1)	EP071: C10 - C14 Fraction	----	636 mg/kg	# 56.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	# Not Determined	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	# Not Determined	60	130
EP080: BTEX (QCLot: 1652700)							
EM1100885-002	BH1 (0.3-0.4)	EP080: Benzene	71-43-2	2 mg/kg	99.3	70	130
		EP080: Toluene	108-88-3	2 mg/kg	101	70	130
EP080: BTEX (QCLot: 1652714)							
EM1100885-025	BH8 (0-0.1)	EP080: Benzene	71-43-2	2 mg/kg	104	70	130
		EP080: Toluene	108-88-3	2 mg/kg	111	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100885**	Page	: 1 of 13
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-JAN-2011
Sampler	: JI, JF	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 35
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**----**	----	----	**01-FEB-2011**	10-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**11-FEB-2011**	26-JUL-2011	✓	**15-FEB-2011**	26-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	03-FEB-2011	✓	**07-FEB-2011**	01-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**14-FEB-2011**	26-JUL-2011	✓	**14-FEB-2011**	26-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	26-JUL-2011	✓	**07-FEB-2011**	26-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	24-FEB-2011	✓	**08-FEB-2011**	24-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
BH1 (0.3-0.4), BH2 (0.2-0.3), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0.2-0.3), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0.3-0.4), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0.3-0.4), BH9 (0.9-1.0), BH13 (0.3-0.4)	**27-JAN-2011**	**01-FEB-2011**	03-FEB-2011	✓	**04-FEB-2011**	15-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
BH4 (0.6-0.7), BH5 (0.6-0.7), BH7 (0.6-0.7), BH8 (1.4-1.5)	**27-JAN-2011**	**----**	----	----	**02-FEB-2011**	26-JUL-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	3	22	**13.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	31	**12.9**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
TPH Volatiles/BTEX	EP080	2	9	**22.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
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

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Acenaphthylene**	208-96-8	28.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Fluorene**	86-73-7	51.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Phenanthrene**	85-01-8	21.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Anthracene**	120-12-7	28.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Fluoranthene**	206-44-0	25.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Pyrene**	129-00-0	29.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benz(a)anthracene**	56-55-3	56.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Chrysene**	218-01-9	50.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benzo(b)fluoranthene**	205-99-2	59.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benzo(a)pyrene**	50-32-8	55.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Indeno(1.2.3.cd)pyrene**	193-39-5	23.0 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)A: Phenolic Compounds	EM1100885-003	BH1 (1-1.1)	**Pentachlorophenol**	87-86-5	54.3 %	70-130%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	EM1100885-026	BH8 (0.3-0.4)	**Pentachlorophenol**	87-86-5	46.1 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C10 - C14 Fraction**	----	56.5 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C15 - C28 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-002	BH1 (0.3-0.4)	**C15 - C28 Fraction**	----	55.2 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C29 - C36 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-002	BH1 (0.3-0.4)	**C29 - C36 Fraction**	----	48.0 %	60-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value 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.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1100937**	Page	: 1 of 8
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 01-FEB-2011
Sampler	: JI	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 12
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Eric Chau	Metals Team Leader	Melbourne Inorganics
Kim McCabe	Senior Inorganic Chemist	Stafford Minerals - AY
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1655143)									
EM1100907-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.1	7.6	6.7	No Limit
EM1100937-001	BH10 (0.2-0.3)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.6	8.0	4.9	No Limit
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QC Lot: 1666298)									
EM1100937-001	BH10 (0.2-0.3)	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.0	No Limit
EM1101169-011	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	<50	0.0	No Limit
ED040T : Total Sulfate by ICPAES (QC Lot: 1655128)									
EM1100937-001	BH10 (0.2-0.3)	ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	560	550	2.3	No Limit
ED042T: Total Sulfur by LECO (QC Lot: 1665545)									
EM1100937-001	BH10 (0.2-0.3)	ED042T: Sulfur - Total as S (LECO)	----	0.01	%	0.01	<0.01	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1655111)									
EM1100885-023	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	6	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	3	30.6	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	7	6	20.1	No Limit
EM1100885-033	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	14	14	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	10	38.3	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	22	26	17.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	126	104	19.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	58	60	3.6	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1655112)									
EM1100885-023	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EM1100885-033	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1660657)									
EM1100872-001	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	1	0.0	No Limit
EM1100947-002	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1655137)									
EM1100885-023	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	1.8	1.9	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	0.7	0.7	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1655137) - continued									
EM1100885-023	Anonymous	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	0.7	0.8	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	2.2	2.4	5.6	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1100937-001	BH10 (0.2-0.3)	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655137)									
EM1100885-023	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	7.0	4.5	43.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	18.6	14.0	# 28.7	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	3.4	2.1	48.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	13.9	8.2	# 51.5	0% - 50%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	124	100	# 21.2	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	29.2	22.0	# 28.4	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	158	123	# 25.1	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	148	109	# 29.8	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	71.5	39.8	# 56.9	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	52.3	31.2	# 50.4	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	71.9	39.0	# 59.2	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	14.7	15.6	5.9	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	60.9	34.3	# 55.9	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	16.7	13.2	# 23.0	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	5.8	4.5	25.2	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	16.8	13.9	18.4	0% - 20%
EM1100937-001	BH10 (0.2-0.3)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	2.4	3.0	21.8	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1655137) - continued									
EM1100937-001	BH10 (0.2-0.3)	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	2.9	2.9	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	1.5	1.7	13.4	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	16.3	15.4	6.1	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	4.5	4.4	3.6	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	19.9	18.1	9.4	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	18.6	16.9	9.6	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	9.9	8.7	13.0	0% - 50%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	7.8	6.8	13.9	0% - 50%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	11.4	10.1	12.5	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.2	3.3	22.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	9.2	7.8	15.8	0% - 50%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	3.9	3.3	18.3	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.3	1.1	19.7	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.3	3.6	18.8	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1654815)									
EM1100914-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1100937-002	BH10 (1-1.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1655136)									
EM1100885-023	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	260	140	62.4	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	200	100	64.7	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1100937-001	BH10 (0.2-0.3)	EP071: C15 - C28 Fraction	----	100	mg/kg	320	110	96.5	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	240	100	79.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1654815)									
EM1100914-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1100937-002	BH10 (1-1.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1666298)								
ED040N: Sulfate as SO4 2-	14808-79-8	50	mg/kg	<50	3000 mg/kg	86.3	85	125
ED040T : Total Sulfate by ICPAES (QCLot: 1655128)								
ED040T: Sulfate as SO4 2-	14808-79-8	100	mg/kg	<100	15000 mg/kg	99.1	81	123
ED042T: Total Sulfur by LECO (QCLot: 1665545)								
ED042T: Sulfur - Total as S (LECO)	----	0.01	%	<0.01	100 %	96.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1655111)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	127	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	116	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	121	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	118	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	119	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	119	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	114	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655112)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	87.9	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1660657)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	116	87	123
EP075(SIM)A: Phenolic Compounds (QCLot: 1655137)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	79.9	63	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	88.8	61	127
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	93.2	61	127
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	92.8	67	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	91.1	54	124
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	92.7	60	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	92.4	61	121
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	87.1	65	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	89.8	64	120
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	80.6	60	120
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	88.4	62	124
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	63.0	10.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655137)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	89.7	70	118
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	89.4	68	120

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655137) - continued								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	87.5	71	117
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	86.8	71	125
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	86.3	68	120
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	91.4	69	119
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	87.0	69	119
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	86.2	69	119
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	88.0	64	122
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	85.9	67	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	81.4	63	121
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	93.1	66	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	87.8	67	121
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	77.8	59	125
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	78.6	59	125
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	76.6	59	123
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1654815)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	88.6	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655136)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	72.0	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	89.8	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	102	63	143
EP080: BTEX (QCLot: 1654815)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	95.2	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	89.8	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	82.7	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	85.6	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	85.6	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM) (QCLot: 1666298)							
EM1101169-001	Anonymous	ED040N: Sulfate as SO4 2-	14808-79-8	3000 mg/kg	74.8	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1655111)							
EM1100885-025	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	94.3	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	78.6	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	113	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	80.0	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	70.3	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1655112)							
EM1100885-025	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	81.0	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1660657)							
EM1100872-002	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	115	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1655137)							
EM1100885-026	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	80.6	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.1	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	99.2	70	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	84.6	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	# 46.1	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1655137)							
EM1100885-026	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	84.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	124	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1654815)							
EM1100914-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	93.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1655136)							
EM1100885-025	Anonymous	EP071: C10 - C14 Fraction	----	636 mg/kg	# 56.5	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	# Not Determined	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	# Not Determined	60	130
EP080: BTEX (QCLot: 1654815)							
EM1100914-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	86.3	70	130
		EP080: Toluene	108-88-3	2 mg/kg	83.8	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100937**	Page	: 1 of 8
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 01-FEB-2011
Sampler	: JI	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 12
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**----**	----	----	**03-FEB-2011**	11-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**11-FEB-2011**	27-JUL-2011	✓	**15-FEB-2011**	27-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**03-FEB-2011**	04-FEB-2011	✓	**07-FEB-2011**	03-MAR-2011	✓
ED042T: Total Sulfur by LECO							
Pulp Bag							
BH10 (0.2-0.3)	**28-JAN-2011**	**11-FEB-2011**	27-JUL-2011	✓	**11-FEB-2011**	27-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**03-FEB-2011**	27-JUL-2011	✓	**07-FEB-2011**	27-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**03-FEB-2011**	25-FEB-2011	✓	**08-FEB-2011**	25-FEB-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
Snap Lock Bag							
BH15 (0.4-0.5)	**28-JAN-2011**	**08-FEB-2011**	04-FEB-2011	×	**09-FEB-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**08-FEB-2011**	04-FEB-2011	×	**09-FEB-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**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
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**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
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Acenaphthylene**	208-96-8	28.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Fluorene**	86-73-7	51.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Phenanthrene**	85-01-8	21.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Anthracene**	120-12-7	28.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Fluoranthene**	206-44-0	25.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Pyrene**	129-00-0	29.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benz(a)anthracene**	56-55-3	56.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Chrysene**	218-01-9	50.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benzo(b)fluoranthene**	205-99-2	59.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benzo(a)pyrene**	50-32-8	55.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Indeno(1.2.3.cd)pyrene**	193-39-5	23.0 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)A: Phenolic Compounds	EM1100885-026	Anonymous	**Pentachlorophenol**	87-86-5	46.1 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C10 - C14 Fraction**	----	56.5 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C15 - C28 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C29 - C36 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

- **For all matrices, no Method Blank value 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: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EK026G: Total Cyanide By Discrete Analyser						

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK026G: Total Cyanide By Discrete Analyser - Analysis Holding Time Compliance						
Snap Lock Bag						
BH15 (0.4-0.5)	08-FEB-2011	04-FEB-2011	**4**	----	----	----
Soil Glass Jar - Unpreserved						
BH10 (0.2-0.3)	08-FEB-2011	04-FEB-2011	**4**	----	----	----

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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1101370**	Page	: 1 of 7
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF, VR	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 9
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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*
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1669036)									
EM1101366-035	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	22.4	22.4	0.0	0% - 20%
EM1101370-003	BH13(0.1-0.4)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.0	14.6	19.5	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1668149)									
EM1101332-031	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	34	34	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	22	21	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	17	10.9	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	38	42	10.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	66	55	18.6	0% - 50%
EM1101343-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	10	23.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	7	47.7	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	11	19.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	21	23.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	36	42.2	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1668150)									
EM1101332-031	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.4	114	No Limit
EM1101343-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1668138)									
EM1101336-015	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1669057)									
EM1101296-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<10.0	<10.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<20.0	<20.0	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1669057)									
EM1101296-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<5.0	<5.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1668187)									
EM1101346-021	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1101370-003	BH13(0.1-0.4)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1669056)									
EM1101296-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	10000	10100	0.9	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	270	280	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	2540	2560	0.9	0% - 20%
EM1101370-002	BH16(0.7-0.8)	EP071: C15 - C28 Fraction	----	100	mg/kg	1460	760	# 63.5	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	1060	530	# 66.8	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1668187)									
EM1101346-021	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1101370-003	BH13(0.1-0.4)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1668149)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	112	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	119	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	114	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	109	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	104	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	119	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	91.5	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1668150)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	87.4	71.9	119
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1668138)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20 mg/kg	110	87	123
EP075(SIM)A: Phenolic Compounds (QCLot: 1669057)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	103	62	124
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	102	63	123
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	106	62	126
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	106	64	126
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	97.2	50	128
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	104	62	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	103	57	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	102	63	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	104	58	126
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	100	54	126
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	98.5	57	127
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	66.8	10	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669057)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	103	64	126
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	104	63	127
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	101	65	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	101	66	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	102	64	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	99.3	66	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	101	66	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	102	66	124
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	101	62	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669057) - continued								
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	100	64	126
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	100	58	126
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	105	65	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	103	61	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	95.0	58	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	95.3	58	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	95.1	57	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668187)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	113	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669056)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	77.9	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	93.0	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	93.2	63	143
EP080: BTEX (QCLot: 1668187)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	103	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	106	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	105	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	108	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	103	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1668149)							
EM1101332-032	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	124	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	120	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	105	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	105	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	123	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	112	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	123	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1668150)							
EM1101332-032	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	83.1	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1668138)							
EM1101339-005	Anonymous	EK026G: Total Cyanide	57-12-5	20 mg/kg	112	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1669057)							
EM1101326-001	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	95.2	64	122
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	95.0	68	120
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	97.8	49	125
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	86.5	60	118
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	56.5	12	136
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669057)							
EM1101326-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	# 48.4	68	122
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	# Not Determined	65	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668187)							
EM1101346-022	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	# Not Determined	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669056)							
EM1101328-001	Anonymous	EP071: C10 - C14 Fraction	----	636 mg/kg	79.4	60	130
		EP071: C15 - C28 Fraction	----	1550 mg/kg	88.6	60	130
		EP071: C29 - C36 Fraction	----	356 mg/kg	91.5	60	130
EP080: BTEX (QCLot: 1668187)							
EM1101346-022	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	# 34.2	70	130
		EP080: Toluene	108-88-3	2 mg/kg	# 29.4	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1101370**	Page	: 1 of 6
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF, VR	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 9
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**----**	----	----	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	09-AUG-2011	✓	**16-FEB-2011**	09-AUG-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	10-MAR-2011	✓	**16-FEB-2011**	10-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH13(0.1-0.4),	**10-FEB-2011**	**14-FEB-2011**	17-FEB-2011	✓	**15-FEB-2011**	28-FEB-2011	✓
BH14(0.4-0.5)								
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM1101370-002	BH16(0.7-0.8)	**C15 - C28 Fraction**	----	63.5 %	0-50%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1101370-002	BH16(0.7-0.8)	**C29 - C36 Fraction**	----	66.8 %	0-50%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1101326-001	Anonymous	**Acenaphthene**	83-32-9	48.4 %	68-122%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1101326-001	Anonymous	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	EM1101346-022	Anonymous	**C6 - C9 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080: BTEX	EM1101346-022	Anonymous	**Benzene**	71-43-2	34.2 %	70-130%	**Recovery less than lower data quality objective**
EP080: BTEX	EM1101346-022	Anonymous	**Toluene**	108-88-3	29.4 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value 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.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1101415**	Page	: 1 of 8
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF/VR	Issue Date	: 10-NOV-2011
Order number	: 210074		
		No. of samples received	: 1
Quote number	: ME/015/11 V3	No. of samples analysed	: 1

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Senior Inorganic Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1671409)									
EM1101407-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	19.5	13.4	37.0	0% - 50%
EM1101422-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	23.1	22.8	1.5	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1672625)									
EM1101404-008	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	14	13	7.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	9	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	8	13.4	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	20	19	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	27	21	24.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	325	288	12.2	0% - 20%
EM1101405-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	13	20.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	10	12.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	8	15.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	6	19.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	26	33	21.9	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1672626)									
EM1101404-008	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.3	0.0	No Limit
EM1101405-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1672610)									
EM1101403-001	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EM1101403-023	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 1672610) - continued									
EM1101403-023	Anonymous	EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1672610)									
EM1101403-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1101403-023	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1672610) - continued									
EM1101403-023	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1670042)									
EM1101406-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EM1101428-041	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1672609)									
EM1101403-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EM1101403-023	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1670042)									
EM1101406-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EM1101428-041	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1672625)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.6 mg/kg	108	79	127
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.8 mg/kg	98.9	76	120
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.9 mg/kg	96.0	76	122
EG005T: Copper	7440-50-8	5	mg/kg	<5	55.1 mg/kg	95.9	76	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.9 mg/kg	99.1	78	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.1 mg/kg	98.6	78	124
EG005T: Zinc	7440-66-6	5	mg/kg	<5	105 mg/kg	95.6	76	120
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1672626)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.47 mg/kg	76.0	71.9	119
EP075(SIM)A: Phenolic Compounds (QCLot: 1672610)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	10 mg/kg	94.9	62	124
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	10 mg/kg	94.5	63	123
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	10 mg/kg	95.8	62	126
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	20 mg/kg	95.3	64	126
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	10 mg/kg	89.7	50	128
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	10 mg/kg	94.2	62	128
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	10 mg/kg	94.2	57	125
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	10 mg/kg	97.2	63	123
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	10 mg/kg	96.5	58	126
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	10 mg/kg	95.4	54	126
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	10 mg/kg	94.8	57	127
EP075(SIM): Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	10 mg/kg	46.9	10	120
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1672610)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	97.4	64	126
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	98.1	63	127
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.2	65	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	97.5	66	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	98.8	64	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	95.6	66	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	97.9	66	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	100	66	124
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	96.7	62	124
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	97.9	64	126
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	98.5	58	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1672610) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	97.1	65	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	97.2	61	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	87.8	58	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	86.7	58	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	88.5	57	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1670042)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	119	71	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1672609)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	67.0	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	85.2	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	93.9	63	143
EP080: BTEX (QCLot: 1670042)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	118	70	122
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	122	72	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	110	68	124
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	122	69	131
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	121	72	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1672625)							
EM1101404-010	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	100	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	104	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	102	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1672626)							
EM1101404-010	Anonymous	EG035T: Mercury	7439-97-6	5.0 mg/kg	78.2	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1672610)							
EM1101403-004	Anonymous	EP075(SIM): Phenol	108-95-2	10 mg/kg	96.5	64	122
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	95.2	68	120
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	92.9	49	125
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	93.1	60	118
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	57.0	12	136
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1672610)							
EM1101403-004	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.6	68	122
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	105	65	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1670042)							
EM1101406-002	Anonymous	EP080: C6 - C9 Fraction	----	28 mg/kg	94.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1672609)							
EM1101403-003	Anonymous	EP071: C10 - C14 Fraction	----	636 mg/kg	64.4	35	141
		EP071: C15 - C28 Fraction	----	1550 mg/kg	81.2	58	108
		EP071: C29 - C36 Fraction	----	356 mg/kg	90.0	40	126
EP080: BTEX (QCLot: 1670042)							
EM1101406-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	120	70	130
		EP080: Toluene	108-88-3	2 mg/kg	120	70	130

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1101415**	Page	: 1 of 5
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF/VR	Issue Date	: 10-NOV-2011
Order number	: 210074		
		No. of samples received	: 1
Quote number	: ME/015/11 V3	No. of samples analysed	: 1

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**----**	----	----	**16-FEB-2011**	24-FEB-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	09-AUG-2011	✓	**21-FEB-2011**	09-AUG-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	10-MAR-2011	✓	**21-FEB-2011**	10-MAR-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike 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.

- **No Analysis Holding 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.**

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **EM1102076**	Page	: 1 of 7
Amendment	: **1**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT MELBOURNE		
C-O-C number	: ----	Date Samples Received	: 02-MAR-2011
Sampler	: SM, SF	Issue Date	: 07-NOV-2011
Order number	: ----		
		No. of samples received	: 14
Quote number	: EN/010/10	No. of samples analysed	: 3

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

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

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*
Herman Lin	Laboratory Coordinator	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Inorganics
Nancy Wang	Senior Semivolatile Instrument Chemist	Melbourne Organics
Xingbin Lin	Senior Organic Chemist	Melbourne Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 1706687)									
EM1102076-002	GW38(11.0-11.1)	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	20.3	20.4	0.0	0% - 20%
EM1102387-013	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	27.2	31.0	13.2	0% - 20%
EK055: Ammonia as N (QC Lot: 1708946)									
EM1102076-002	GW38(11.0-11.1)	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1703965)									
EM1102076-002	GW38(11.0-11.1)	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1703927)									
EM1102076-002	GW38(11.0-11.1)	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1703964)									
EM1102076-002	GW38(11.0-11.1)	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
		EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1703927)									
EM1102076-002	GW38(11.0-11.1)	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1703964)									
EM1102076-002	GW38(11.0-11.1)	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1703964) - continued									
EM1102076-002	GW38(11.0-11.1)	EP071: >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1703927)									
EM1102076-002	GW38(11.0-11.1)	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EK055: Ammonia as N (QCLot: 1708946)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	25 mg/kg	95.8	91	109
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1703965)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	10 mg/kg	96.1	64	126
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	10 mg/kg	98.8	63	127
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	10 mg/kg	97.1	65	125
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	10 mg/kg	94.0	66	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10 mg/kg	96.8	64	124
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	10 mg/kg	72.6	66	126
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	10 mg/kg	77.2	66	124
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	10 mg/kg	# 62.8	66	124
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	10 mg/kg	64.0	62	124
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	10 mg/kg	64.8	64	126
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	10 mg/kg	93.3	58	126
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	10 mg/kg	99.5	65	127
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10 mg/kg	95.2	61	125
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	10 mg/kg	92.5	58	126
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	10 mg/kg	91.6	58	126
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	10 mg/kg	87.6	57	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1703927)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	32 mg/kg	111	70	133
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1703964)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	636 mg/kg	76.9	54	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	1550 mg/kg	91.1	74	134
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	356 mg/kg	90.1	63	143
EP071: C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1703927)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	37 mg/kg	110	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1703964)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	894 mg/kg	91.0	54	123
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	1734 mg/kg	86.8	74	134
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	106 mg/kg	63.0	63	143
EP071: >C10 - C40 Fraction (sum)	----	100	mg/kg	<100	----	----	----	----
EP080: BTEX (QCLot: 1703927)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	2 mg/kg	106	72	126

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP080: BTEX (QCLot: 1703927) - continued								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	2 mg/kg	112	73	129
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	2 mg/kg	109	72	126
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	4 mg/kg	120	70	138
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	2 mg/kg	117	73	131

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK055: Ammonia as N (QCLot: 1708946)							
EM1102076-002	GW38(11.0-11.1)	EK055: Ammonia as N	7664-41-7	100 mg/kg	91.1	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1703965)							
EM1102076-008	GW39(11.4-11.5)	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.9	68	122
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	75.8	65	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1703927)							
EM1102076-005	GW37(11.0-11.1)	EP080: C6 - C9 Fraction	----	28 mg/kg	74.2	49	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1703964)							
EM1102076-005	GW37(11.0-11.1)	EP071: C10 - C14 Fraction	----	636 mg/kg	57.0	54	123
		EP071: C15 - C28 Fraction	----	1550 mg/kg	75.4	74	134
		EP071: C29 - C36 Fraction	----	356 mg/kg	86.1	63	143
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1703927)							
EM1102076-005	GW37(11.0-11.1)	EP080: C6 - C10 Fraction	----	33 mg/kg	116	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1703964)							
EM1102076-005	GW37(11.0-11.1)	EP071: >C10 - C16 Fraction	----	894 mg/kg	68.6	54	123
		EP071: >C16 - C34 Fraction	----	1723 mg/kg	77.0	74	134
		EP071: >C34 - C40 Fraction	----	106 mg/kg	# Not Determined	63	143
EP080: BTEX (QCLot: 1703927)							
EM1102076-005	GW37(11.0-11.1)	EP080: Benzene	71-43-2	2 mg/kg	82.9	58	136
		EP080: Toluene	108-88-3	2 mg/kg	91.3	63	135

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1102076**	Page	: 1 of 5
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT MELBOURNE		
C-O-C number	: ----	Date Samples Received	: 02-MAR-2011
Sampler	: SM, SF	Issue Date	: 07-NOV-2011
Order number	: ----		
		No. of samples received	: 14
Quote number	: EN/010/10	No. of samples analysed	: 3

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: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**----**	----	----	**15-MAR-2011**	15-MAR-2011	✓
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**----**	----	----	**17-MAR-2011**	28-AUG-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**12-MAR-2011**	20-APR-2011	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	20-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	20-APR-2011	✓
EP080: BTEX								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	15-MAR-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	2002731-005	----	**Pyrene**	129-00-0	62.8 %	66-124%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1102076-005	GW37(11.0-11.1)	**>C34 - C40 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

- **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 Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

ATTACHMENT C3 ALS INTERPRETIVE QUALITY CONTROL (QCI) REPORTS

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100639**	Page	: 1 of 12
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 03-NOV-2011
Order number	: 210074		
		No. of samples received	: 36
Quote number	: ME/015/11 V3	No. of samples analysed	: 33

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**----**	----	----	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP11 (1.2-1.3)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag							
TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Pulp Bag							
TP11 (1.2-1.3)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	17-JUL-2011	✓	**28-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**28-JAN-2011**	18-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	15-FEB-2011	✓	**31-JAN-2011**	15-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP1 (0.3-0.35), TP2 (0-0.1), TP3 (0.3), TP4 (0.25-0.3), TP6 (0.25-0.3), TP7 (0.3-0.4), TP7 (1.75-1.8), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP10 (1-1.1), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4), TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved							
TP1 (0-0.1), TP1 (0.35-0.4), TP1 (0.3-0.35), TP2 (0-0.1), TP2 (0.95-1.0), TP2 (1.5-1.6), TP3 (0-0.1), TP3 (0.3), TP3 (1.4), TP4 (0-0.1), TP4 (0.25-0.3), TP4 (0.5), TP5 (0-0.1), TP5 (0.8), TP5 (1.8), TP6 (0-0.1), TP6 (0.25-0.3), TP6 (1.75-1.8), TP7 (0-0.1), TP7 (0.3-0.4)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP7 (1.75-1.8), TP7 (2.9-3), TP8 (0-0.1), TP8 (0.6-0.7)	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP9 (0-0.1), TP9 (0.4-0.5), TP9 (0.7-0.8), TP10 (0-0.1), TP10 (0.5-0.6), TP10 (1-1.1), TP11 (0-0.2), TP11 (0.5-0.6), TP11 (1.2-1.3)	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	6	60	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	4	32	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	32	**6.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Acenaphthene**	83-32-9	40.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Fluorene**	86-73-7	39.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Benzo(a)pyrene**	50-32-8	21.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**Dibenz(a.h)anthracene**	53-70-3	22.7 %	0-20%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1100639-024	TP7 (1.75-1.8)	**C15 - C28 Fraction**	----	29.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1933149-005	----	**Phenanthrene**	85-01-8	124 %	68-120%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	TP7 (1.75-1.8)	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)A: Phenolic Compounds	EM1100639-003	TP1 (0.3-0.35)	**Pentachlorophenol**	87-86-5	44.4 %	70-130%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	EM1100639-026	TP8 (0-0.1)	**Pentachlorophenol**	87-86-5	45.4 %	70-130%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM1100639-024	TP7 (1.75-1.8)	**4-Bromofluorobenzene**	460-00-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100640**	Page	: 1 of 13
Amendment	: **2**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 04-NOV-2011
Order number	: 210074		
		No. of samples received	: 37
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0-0.1), TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0-0.1), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP14 (0.85-0.9), TP15 (0-0.1), TP15 (0.5-0.6), TP15 (1-1.1), TP15 (2.4-2.5), TP16 (0.05-0.15), TP16 (0.4-0.5), TP16 (1-1.1), TP16 (2-2.1)	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0-0.1), TP17 (0.3-0.4), TP17 (1.0-1.1), TP18 (0-0.1), TP18 (0.25-0.3), TP18 (0.7-0.8), TP19 (0-0.1), TP19 (0.3-0.4), TP19 (0.6-0.7), TP20 (0.1-0.2), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**----**	----	----	**27-JAN-2011**	03-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0.2-0.3), TP15 (0-0.1), TP16 (0.05-0.15)	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP18 (0.25-0.3), TP18 (0.7-0.8), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0.2-0.3), TP15 (0-0.1), TP16 (0.05-0.15)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP18 (0.25-0.3), TP18 (0.7-0.8), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO								
Pulp Bag								
TP11 (2-2.1),	TP12 (0.2-0.3),	**19-JAN-2011**	**27-JAN-2011**	18-JUL-2011	✓	**27-JAN-2011**	18-JUL-2011	✓
TP15 (0-0.1),	TP16 (0.05-0.15)							
Pulp Bag								
TP18 (0.25-0.3),	TP18 (0.7-0.8),	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**28-JAN-2011**	18-JUL-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP16 (0.05-0.15),							
TP16 (0.4-0.5),	TP16 (1-1.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	19-JUL-2011	✓	**28-JAN-2011**	19-JUL-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP16 (0.05-0.15),							
TP16 (0.4-0.5),	TP16 (1-1.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	17-FEB-2011	✓	**31-JAN-2011**	17-FEB-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP15 (0.5-0.6), TP16 (1-1.1)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0.3-0.4), TP18 (0.25-0.3), TP19 (0.6-0.7), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0.45-0.5)	**20-JAN-2011**	**27-JAN-2011**	27-JAN-2011	✓	**28-JAN-2011**	10-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
TP20 (0.8-0.9)	**20-JAN-2011**	**----**	----	----	**28-JAN-2011**	19-JUL-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
TP11 (2-2.1), TP12 (0-0.1), TP12 (0.2-0.3), TP12 (0.6-0.7), TP13 (0-0.1), TP13 (0.3-0.35), TP13 (0.8-0.85), TP14 (0.1-0.15), TP14 (0.5-0.6), TP14 (0.85-0.9), TP15 (0-0.1), TP15 (0.5-0.6), TP15 (1-1.1), TP16 (0.05-0.15), TP16 (0.4-0.5), TP16 (1-1.1)	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved							
TP17 (0-0.1), TP17 (0.3-0.4), TP17 (1.0-1.1), TP18 (0-0.1), TP18 (0.25-0.3), TP18 (0.7-0.8), TP19 (0-0.1), TP19 (0.3-0.4), TP19 (0.6-0.7), TP20 (0.1-0.2), TP20 (0.6-0.7), TP20 (0.8-0.9), TP21 (0-0.1), TP21 (0.45-0.5)	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4),	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
TP17 (1.0-1.1),	TP18 (0-0.1),							
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX								
Soil Glass Jar - Unpreserved								
TP11 (2-2.1),	TP12 (0-0.1),	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
TP12 (0.2-0.3),	TP12 (0.6-0.7),							
TP13 (0-0.1),	TP13 (0.3-0.35),							
TP13 (0.8-0.85),	TP14 (0.1-0.15),							
TP14 (0.5-0.6),	TP14 (0.85-0.9),							
TP15 (0-0.1),	TP15 (0.5-0.6),							
TP15 (1-1.1),	TP15 (2.4-2.5),							
TP16 (0.05-0.15),	TP16 (0.4-0.5),							
TP16 (1-1.1),	TP16 (2-2.1)							
Soil Glass Jar - Unpreserved								
TP17 (0-0.1),	TP17 (0.3-0.4)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved								
TP17 (1.0-1.1),	TP18 (0-0.1),	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
TP18 (0.25-0.3),	TP18 (0.7-0.8),							
TP19 (0-0.1),	TP19 (0.3-0.4),							
TP19 (0.6-0.7),	TP20 (0.1-0.2),							
TP20 (0.6-0.7),	TP20 (0.8-0.9),							
TP21 (0-0.1),	TP21 (0.45-0.5)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	38	**5.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	Anonymous	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100640-024	TP17 (1.0-1.1)	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100640-003	TP12 (0.2-0.3)	**Pyrene**	129-00-0	47.0 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100632-002	Anonymous	**C29 - C36 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080: BTEX	EM1100632-002	Anonymous	**Benzene**	71-43-2	146 %	70-130%	**Recovery greater than upper data quality objective**
EP080: BTEX	EM1100632-002	Anonymous	**Toluene**	108-88-3	146 %	70-130%	**Recovery greater than upper 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.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100641**	Page	: 1 of 14
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-JAN-2011
Sampler	: ----	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 32
Quote number	: ME/015/11 V3	No. of samples analysed	: 30

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**----**	----	----	**27-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**----**	----	----	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**----**	----	----	**27-JAN-2011**	03-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved DUP2	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved DUP2	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	22-FEB-2011	✓
ED042T: Total Sulfur by LECO							
Pulp Bag DUP2	**18-JAN-2011**	**27-JAN-2011**	17-JUL-2011	✓	**27-JAN-2011**	17-JUL-2011	✓
Pulp Bag TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	19-JUL-2011	✓	**27-JAN-2011**	19-JUL-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	17-JUL-2011	✓	**31-JAN-2011**	17-JUL-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**28-JAN-2011**	18-JUL-2011	✓	**31-JAN-2011**	18-JUL-2011	✓
Soil Glass Jar - Unpreserved							
TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	19-JUL-2011	✓	**31-JAN-2011**	19-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	15-FEB-2011	✓	**31-JAN-2011**	15-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**28-JAN-2011**	16-FEB-2011	✓	**31-JAN-2011**	16-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	17-FEB-2011	✓	**31-JAN-2011**	17-FEB-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	25-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP3	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	08-FEB-2011	✓
Soil Glass Jar - Unpreserved							
TP22 (0.3-0.4), TP23 (0.4-0.5), TP24 (0.5-0.6), TP25 (0.7-0.8), TP26 (0.5-0.6), TP26 (1.8-1.9)	**20-JAN-2011**	**27-JAN-2011**	27-JAN-2011	✓	**28-JAN-2011**	10-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
TP25 (0.7-0.8), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**----**	----	----	**28-JAN-2011**	19-JUL-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6), DUP4, DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**28-JAN-2011**	01-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**28-JAN-2011**	02-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), DUP4, TP26 (1.8-1.9), TP26 (2.5-2.6), DUP5, DUP7	**20-JAN-2011**	**28-JAN-2011**	03-FEB-2011	✓	**28-JAN-2011**	09-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved DUP1, DUP2	**18-JAN-2011**	**25-JAN-2011**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP3	**19-JAN-2011**	**25-JAN-2011**	02-FEB-2011	✓	**27-JAN-2011**	02-FEB-2011	✓
Soil Glass Jar - Unpreserved TP21 (0.8-0.9), TP22 (0-0.1), TP22 (0.3-0.4), TP22 (0.6-0.7), TP22 (2.4-2.5), TP23 (0-0.1), TP23 (0.4-0.5), TP23 (1-1.1), TP24 (0-0.1), TP24 (0.5-0.6), TP24 (1.1-1.2), TP25 (0-0.1), TP25 (0.7-0.8), TP25 (1.2-1.3), TP26 (0-0.1), TP26 (0.5-0.6), TP26 (1.8-1.9), TP26 (2.5-2.6)	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
Soil Glass Jar - Unpreserved DUP4, DUP5, DUP7	**20-JAN-2011**	**25-JAN-2011**	03-FEB-2011	✓	**27-JAN-2011**	03-FEB-2011	✓

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 - Natural Rinsate (1)	**18-JAN-2011**	**---**	17-JUL-2011	----	**28-JAN-2011**	17-JUL-2011	✓
Clear Plastic Bottle - Natural Rinsate (2)	**19-JAN-2011**	**---**	18-JUL-2011	----	**28-JAN-2011**	18-JUL-2011	✓
Clear Plastic Bottle - Natural Rinsate (3)	**20-JAN-2011**	**---**	19-JUL-2011	----	**28-JAN-2011**	19-JUL-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Natural Rinsate (1)	**18-JAN-2011**	**---**	15-FEB-2011	----	**31-JAN-2011**	15-FEB-2011	✓
Clear Plastic Bottle - Natural Rinsate (2)	**19-JAN-2011**	**---**	16-FEB-2011	----	**31-JAN-2011**	16-FEB-2011	✓
Clear Plastic Bottle - Natural Rinsate (3)	**20-JAN-2011**	**---**	17-FEB-2011	----	**31-JAN-2011**	17-FEB-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved Rinsate (2)	**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)	**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved Rinsate (2)		**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)		**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved Rinsate (2)		**19-JAN-2011**	**25-JAN-2011**	26-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber Glass Bottle - Unpreserved Rinsate (3)		**20-JAN-2011**	**25-JAN-2011**	27-JAN-2011	✓	**27-JAN-2011**	06-MAR-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓
EP080: BTEX								
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (1),	Trip 1	**18-JAN-2011**	**25-JAN-2010**	01-FEB-2011	✓	**25-JAN-2011**	01-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (2),	Trip 2	**19-JAN-2011**	**25-JAN-2010**	02-FEB-2011	✓	**25-JAN-2011**	02-FEB-2011	✓
Amber VOC Vial- NaHSO4 or H2SO4 Rinsate (3),	Trip 3	**20-JAN-2011**	**25-JAN-2010**	03-FEB-2011	✓	**25-JAN-2011**	03-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	33	**12.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	37	**10.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	37	**5.4**	**5.0**	✓	ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
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
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (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)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 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) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 500 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Acenaphthylene**	208-96-8	29.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Acenaphthene**	83-32-9	40.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Fluorene**	86-73-7	39.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Phenanthrene**	85-01-8	46.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Phenanthrene**	85-01-8	23.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Anthracene**	120-12-7	35.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Fluoranthene**	206-44-0	35.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Pyrene**	129-00-0	35.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benz(a)anthracene**	56-55-3	24.6 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benz(a)anthracene**	56-55-3	33.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Chrysene**	218-01-9	37.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Chrysene**	218-01-9	37.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benzo(b)fluoranthene**	205-99-2	48.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(b)fluoranthene**	205-99-2	86.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(k)fluoranthene**	207-08-9	44.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(a)pyrene**	50-32-8	74.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-011	TP24 (1.1-1.2)	**Benzo(a)pyrene**	50-32-8	38.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Benzo(a)pyrene**	50-32-8	21.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Indeno(1.2.3.cd)pyrene**	193-39-5	73.6 %	0-50%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100639-024	Anonymous	**Dibenz(a.h)anthracene**	53-70-3	22.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100641-004	TP22 (0.6-0.7)	**Benzo(g.h.i)perylene**	191-24-2	74.1 %	0-50%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1100639-024	Anonymous	**C15 - C28 Fraction**	----	29.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1933149-005	----	**Phenanthrene**	85-01-8	124 %	68-120%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK026G: Total Cyanide By Discrete Analyser	EM1100639-024	Anonymous	**Total Cyanide**	57-12-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP075(SIM)A: Phenolic Compounds	EM1100639-026	Anonymous	**Pentachlorophenol**	87-86-5	45.4 %	70-130%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	**Analyte**	CAS Number	Data	Limits	**Comment**
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EM1100641-024	Trip 2	**1.2-Dichloroethane-D4**	17060-07-0	126 %	77.5-124.5 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100885**	Page	: 1 of 13
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-JAN-2011
Sampler	: JI, JF	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 35
Quote number	: ME/015/11 V3	No. of samples analysed	: 32

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**----**	----	----	**01-FEB-2011**	10-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**11-FEB-2011**	26-JUL-2011	✓	**15-FEB-2011**	26-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	03-FEB-2011	✓	**07-FEB-2011**	01-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED042T: Total Sulfur by LECO							
Pulp Bag							
BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0.6-0.7), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (1.4-1.5), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**14-FEB-2011**	26-JUL-2011	✓	**14-FEB-2011**	26-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	26-JUL-2011	✓	**07-FEB-2011**	26-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	24-FEB-2011	✓	**08-FEB-2011**	24-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved							
BH1 (0.3-0.4), BH2 (0.2-0.3), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0.2-0.3), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0.3-0.4), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0.3-0.4), BH9 (0.9-1.0), BH13 (0.3-0.4)	**27-JAN-2011**	**01-FEB-2011**	03-FEB-2011	✓	**04-FEB-2011**	15-FEB-2011	✓
EK055: Ammonia as N							
Soil Glass Jar - Unpreserved							
BH4 (0.6-0.7), BH5 (0.6-0.7), BH7 (0.6-0.7), BH8 (1.4-1.5)	**27-JAN-2011**	**----**	----	----	**02-FEB-2011**	26-JUL-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**03-FEB-2011**	10-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEX							
Soil Glass Jar - Unpreserved							
BH1 (0-0.1), BH1 (0.3-0.4), BH1 (1-1.1), BH2 (0-0.1), BH2 (0.2-0.3), BH2 (0.9-1), BH3 (0-0.1), BH3 (0.2-0.3), BH3 (0.6-0.7), BH4 (0-0.1), BH4 (0.2-0.3), BH4 (0.6-0.7), BH5 (0-0.1), BH5 (0.2-0.3), BH5 (0.6-0.7), BH6 (0-0.1), BH6 (0.3-0.4), BH7 (0-0.1), BH6 (1.7-1.8), BH7 (0.3-0.4), BH7 (0.6-0.7), BH8 (0-0.1), BH8 (0.3-0.4), BH8 (1.4-1.5), BH9 (0.2-0.3), BH9 (0.9-1.0), BH9 (1.4-1.5), BH13 (0-0.1), BH13 (0.3-0.4), BH14 (0.05-0.15)	**27-JAN-2011**	**01-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial- NaHSO4 or H2SO4							
Trip 4	**27-JAN-2011**	**02-FEB-2011**	10-FEB-2011	✓	**02-FEB-2011**	10-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	3	22	**13.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	40	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	38	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	31	**12.9**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	22	**9.1**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Matrix Spikes (MS) - Continued							
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	31	**6.5**	**5.0**	✓	ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
TPH Volatiles/BTEX	EP080	2	9	**22.2**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
TPH Volatiles/BTEX	EP080	1	9	**11.1**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
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

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Acenaphthylene**	208-96-8	28.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Fluorene**	86-73-7	51.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Phenanthrene**	85-01-8	21.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Anthracene**	120-12-7	28.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Fluoranthene**	206-44-0	25.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Pyrene**	129-00-0	29.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benz(a)anthracene**	56-55-3	56.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Chrysene**	218-01-9	50.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benzo(b)fluoranthene**	205-99-2	59.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Benzo(a)pyrene**	50-32-8	55.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	BH7 (0.6-0.7)	**Indeno(1.2.3.cd)pyrene**	193-39-5	23.0 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)A: Phenolic Compounds	EM1100885-003	BH1 (1-1.1)	**Pentachlorophenol**	87-86-5	54.3 %	70-130%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	EM1100885-026	BH8 (0.3-0.4)	**Pentachlorophenol**	87-86-5	46.1 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C10 - C14 Fraction**	----	56.5 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C15 - C28 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-002	BH1 (0.3-0.4)	**C15 - C28 Fraction**	----	55.2 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	BH8 (0-0.1)	**C29 - C36 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-002	BH1 (0.3-0.4)	**C29 - C36 Fraction**	----	48.0 %	60-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value 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.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1100937**	Page	: 1 of 8
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 01-FEB-2011
Sampler	: JI	Issue Date	: 08-NOV-2011
Order number	: 210074		
		No. of samples received	: 12
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**----**	----	----	**03-FEB-2011**	11-FEB-2011	✓
ED040N: Sulfate - Calcium Phosphate Soluble (NEPM)							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**11-FEB-2011**	27-JUL-2011	✓	**15-FEB-2011**	27-JUL-2011	✓
ED040T : Total Sulfate by ICPAES							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**03-FEB-2011**	04-FEB-2011	✓	**07-FEB-2011**	03-MAR-2011	✓
ED042T: Total Sulfur by LECO							
Pulp Bag							
BH10 (0.2-0.3)	**28-JAN-2011**	**11-FEB-2011**	27-JUL-2011	✓	**11-FEB-2011**	27-JUL-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**03-FEB-2011**	27-JUL-2011	✓	**07-FEB-2011**	27-JUL-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3), BH10 (1-1.1), BH10 (1.6-1.7), BH11 (0.5-0.6), BH11 (1.3-1.4), BH15 (0-0.1), BH15 (0.4-0.5), BH15 (0.8-0.9)	**28-JAN-2011**	**03-FEB-2011**	25-FEB-2011	✓	**08-FEB-2011**	25-FEB-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
Snap Lock Bag							
BH15 (0.4-0.5)	**28-JAN-2011**	**08-FEB-2011**	04-FEB-2011	×	**09-FEB-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH10 (0.2-0.3)	**28-JAN-2011**	**08-FEB-2011**	04-FEB-2011	×	**09-FEB-2011**	22-FEB-2011	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**04-FEB-2011**	15-MAR-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
BH10 (0.2-0.3),	BH10 (1-1.1),	**28-JAN-2011**	**03-FEB-2011**	11-FEB-2011	✓	**03-FEB-2011**	11-FEB-2011	✓
BH10 (1.6-1.7),	BH11 (0.5-0.6),							
BH11 (1.3-1.4),	BH15 (0-0.1),							
BH15 (0.4-0.5),	BH15 (0.8-0.9)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**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
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfate as SO4 2- Total	ED040T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Sulfur - Total as S (LECO)	ED042T	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**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
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Sulfate - Calcium Phosphate Soluble	ED040N	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	17	**5.9**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Sulfate - Calcium Phosphate Soluble	ED040N	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulfate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
Sulfate as SO4 2- Total	ED040T	SOIL	In-house. Total Sulfate is determined off a HCl digestion by ICPAES as S , and reported as SO4
Sulfur - Total as S (LECO)	ED042T	SOIL	In-house. Dried and pulverised sample is combusted in a LECO furnace at 1350C in the presence of strong oxidants / catalysts. The evolved S (as SO2) is measured by infra-red detector
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Sulfide as S	EK085	SOIL	In-house. Sulfide in a soil is determined as the difference between Total Sulfur (Leco) and Sulfate.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Calcium Phosphate Extraction for Sulphate as SO4 2-	ED040NPR	SOIL	The sample is extracted with a calcium phosphate solution. The phosphate ion displaces the adsorbed sulphate while calcium ions depress the extraction of interfering S from soil organic matter. SO4 in the extract is determined by ICPAES and reported as dry weight in the original soil. This method is compliant with NEPM (1999) Schedule B(3) (Method 406)
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
HCl Digest	EN24	SOIL	1g of soil is digested in 30 ml of 30% HCl and the resultant digest bulked and filtered for analysis by ICP.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Acenaphthylene**	208-96-8	28.7 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Fluorene**	86-73-7	51.5 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Phenanthrene**	85-01-8	21.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Anthracene**	120-12-7	28.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Fluoranthene**	206-44-0	25.1 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Pyrene**	129-00-0	29.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benz(a)anthracene**	56-55-3	56.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Chrysene**	218-01-9	50.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benzo(b)fluoranthene**	205-99-2	59.2 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Benzo(a)pyrene**	50-32-8	55.9 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1100885-023	Anonymous	**Indeno(1.2.3.cd)pyrene**	193-39-5	23.0 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)A: Phenolic Compounds	EM1100885-026	Anonymous	**Pentachlorophenol**	87-86-5	46.1 %	70-130%	**Recovery less than lower control limit**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C10 - C14 Fraction**	----	56.5 %	60-130%	**Recovery less than lower data quality objective**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C15 - C28 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080/071: Total Petroleum Hydrocarbons	EM1100885-025	Anonymous	**C29 - C36 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

- **For all matrices, no Method Blank value 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: **SOIL**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EK026G: Total Cyanide By Discrete Analyser						

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EK026G: Total Cyanide By Discrete Analyser - Analysis Holding Time Compliance						
Snap Lock Bag						
BH15 (0.4-0.5)	08-FEB-2011	04-FEB-2011	**4**	----	----	----
Soil Glass Jar - Unpreserved						
BH10 (0.2-0.3)	08-FEB-2011	04-FEB-2011	**4**	----	----	----

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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1101370**	Page	: 1 of 6
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF, VR	Issue Date	: 07-NOV-2011
Order number	: 210074		
		No. of samples received	: 9
Quote number	: ME/015/11 V3	No. of samples analysed	: 8

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: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**----**	----	----	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	09-AUG-2011	✓	**16-FEB-2011**	09-AUG-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	10-MAR-2011	✓	**16-FEB-2011**	10-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH13(0.1-0.4),	**10-FEB-2011**	**14-FEB-2011**	17-FEB-2011	✓	**15-FEB-2011**	28-FEB-2011	✓
BH14(0.4-0.5)								
EP075(SIM)A: Phenolic Compounds								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	27-MAR-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							
EP080: BTEX								
Soil Glass Jar - Unpreserved								
BH16(0.2-0.3),	BH16(0.7-0.8),	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
BH13(0.1-0.4),	BH13(0.6-0.7),							
BH13(1.1-1.3),	BH14(0.7-0.8),							
BH14(0.4-0.5),	BH14(1.3-1.4)							

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
NaOH leach for TCN in Soils	EK026PR	SOIL	APHA 21st ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP080/071: Total Petroleum Hydrocarbons	EM1101370-002	BH16(0.7-0.8)	**C15 - C28 Fraction**	----	63.5 %	0-50%	**RPD exceeds LOR based limits**
EP080/071: Total Petroleum Hydrocarbons	EM1101370-002	BH16(0.7-0.8)	**C29 - C36 Fraction**	----	66.8 %	0-50%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1101326-001	Anonymous	**Acenaphthene**	83-32-9	48.4 %	68-122%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	EM1101326-001	Anonymous	**Pyrene**	129-00-0	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP080/071: Total Petroleum Hydrocarbons	EM1101346-022	Anonymous	**C6 - C9 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP080: BTEX	EM1101346-022	Anonymous	**Benzene**	71-43-2	34.2 %	70-130%	**Recovery less than lower data quality objective**
EP080: BTEX	EM1101346-022	Anonymous	**Toluene**	108-88-3	29.4 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Method Blank value 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.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1101415**	Page	: 1 of 5
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: JF/VR	Issue Date	: 10-NOV-2011
Order number	: 210074		
		No. of samples received	: 1
Quote number	: ME/015/11 V3	No. of samples analysed	: 1

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: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**----**	----	----	**16-FEB-2011**	24-FEB-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	09-AUG-2011	✓	**21-FEB-2011**	09-AUG-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	10-MAR-2011	✓	**21-FEB-2011**	10-MAR-2011	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**17-FEB-2011**	24-FEB-2011	✓	**17-FEB-2011**	29-MAR-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
DUP8	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	24-FEB-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike 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.

- **No Analysis Holding 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.**

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **EM1102076**	Page	: 1 of 5
Amendment	: **1**		
Client	: ENVIRONMENTAL EARTH SCIENCES	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PORT MELBOURNE		
C-O-C number	: ----	Date Samples Received	: 02-MAR-2011
Sampler	: SM, SF	Issue Date	: 07-NOV-2011
Order number	: ----		
		No. of samples received	: 14
Quote number	: EN/010/10	No. of samples analysed	: 3

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: **SOIL**

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

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**----**	----	----	**15-MAR-2011**	15-MAR-2011	✓
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**----**	----	----	**17-MAR-2011**	28-AUG-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**12-MAR-2011**	20-APR-2011	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	20-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	20-APR-2011	✓
EP080: BTEX								
Soil Glass Jar - Unpreserved								
GW38(11.0-11.1), GW39(11.4-11.5)	GW37(11.0-11.1),	**01-MAR-2011**	**11-MAR-2011**	15-MAR-2011	✓	**15-MAR-2011**	15-MAR-2011	✓

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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	3	**33.3**	**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
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

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 SW846 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: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	2002731-005	----	**Pyrene**	129-00-0	62.8 %	66-124%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EM1102076-005	GW37(11.0-11.1)	**>C34 - C40 Fraction**	----	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

- **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 Extraction / Preparation and/or Analysis component is/are displayed.

- **No Analysis Holding 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.**

ATTACHMENT C4 SAMPLE RECEIPT NOTIFICATION

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1100639**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 3
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-JAN-2011	Issue Date	: 24-JAN-2011 16:24
Client Requested Due Date	: 31-JAN-2011	Scheduled Reporting Date	: **31-JAN-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 15.4-18.6 - Ice bricks present
No. of coolers/boxes	: 3	No. of samples received	: 36
Security Seal	: Intact.	No. of samples analysed	: 31

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- ***This is a split batch of EM1100640 & EM1100641.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100639-001	18-JAN-2011 15:00	TP1 (0-0.1)					✓
EM1100639-002	18-JAN-2011 15:00	TP1 (0.35-0.4)					✓
EM1100639-003	18-JAN-2011 15:00	TP1 (0.3-0.35)			✓		✓
EM1100639-004	18-JAN-2011 15:00	TP2 (0-0.1)			✓		✓
EM1100639-005	18-JAN-2011 15:00	TP2 (0.95-1.0)					✓
EM1100639-006	18-JAN-2011 15:00	TP2 (1.5-1.6)					✓
EM1100639-007	18-JAN-2011 15:00	TP3 (0-0.1)					✓
EM1100639-008	18-JAN-2011 15:00	TP3 (0.3)			✓		✓
EM1100639-009	18-JAN-2011 15:00	TP3 (1.4)					✓
EM1100639-010	18-JAN-2011 15:00	TP3 (2.0)	✓				
EM1100639-011	18-JAN-2011 15:00	TP4 (0-0.1)					✓
EM1100639-012	18-JAN-2011 15:00	TP4 (0.25-0.3)			✓		✓
EM1100639-013	18-JAN-2011 15:00	TP4 (0.5)					✓
EM1100639-014	18-JAN-2011 15:00	TP5 (0-0.1)					✓
EM1100639-015	18-JAN-2011 15:00	TP5 (0.8)	✓				
EM1100639-016	18-JAN-2011 15:00	TP5 (1.1)	✓				
EM1100639-017	18-JAN-2011 15:00	TP5 (1.8)					✓
EM1100639-018	18-JAN-2011 15:00	TP6 (0-0.1)					✓
EM1100639-019	18-JAN-2011 15:00	TP6 (0.25-0.3)			✓		✓
EM1100639-020	18-JAN-2011 15:00	TP6 (0.75-0.8)	✓				
EM1100639-021	18-JAN-2011 15:00	TP6 (1.75-1.8)					✓
EM1100639-022	18-JAN-2011 15:00	TP7 (0-0.1)					✓
EM1100639-023	18-JAN-2011 15:00	TP7 (0.3-0.4)			✓		✓
EM1100639-024	18-JAN-2011 15:00	TP7 (1.75-1.8)		✓	✓	✓	✓
EM1100639-025	18-JAN-2011 15:00	TP7 (2.9-3)	✓				
EM1100639-026	18-JAN-2011 15:00	TP8 (0-0.1)					✓
EM1100639-027	18-JAN-2011 15:00	TP8 (0.6-0.7)		✓	✓	✓	✓
EM1100639-028	19-JAN-2011 15:00	TP9 (0-0.1)					✓
EM1100639-029	19-JAN-2011 15:00	TP9 (0.4-0.5)					✓
EM1100639-030	19-JAN-2011 15:00	TP9 (0.7-0.8)					✓
EM1100639-031	19-JAN-2011 15:00	TP10 (0-0.1)					✓
EM1100639-032	19-JAN-2011 15:00	TP10 (0.5-0.6)					✓
EM1100639-033	19-JAN-2011 15:00	TP10 (1-1.1)			✓		✓
EM1100639-034	19-JAN-2011 15:00	TP11 (0-0.2)					✓
EM1100639-035	19-JAN-2011 15:00	TP11 (0.5-0.6)			✓		✓

			(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100639-036	19-JAN-2011 15:00	TP11 (1.2-1.3)		✓	✓	✓	✓

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1100640**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 3
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-JAN-2011	Issue Date	: 24-JAN-2011 16:31
Client Requested Due Date	: 31-JAN-2011	Scheduled Reporting Date	: **31-JAN-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 15.4-18.6 - Ice bricks present
No. of coolers/boxes	: 3	No. of samples received	: 37
Security Seal	: Intact.	No. of samples analysed	: 30

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- ***This is a split batch of EM1100639 & EM1100641.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100640-001	19-JAN-2011 15:00	TP11 (2-2.1)		✓			✓	✓
EM1100640-002	19-JAN-2011 15:00	TP12 (0-0.1)						✓
EM1100640-003	19-JAN-2011 15:00	TP12 (0.2-0.3)		✓	✓		✓	✓
EM1100640-004	19-JAN-2011 15:00	TP12 (0.6-0.7)			✓			✓
EM1100640-005	19-JAN-2011 15:00	TP12 (1.7-1.8)	✓					
EM1100640-006	19-JAN-2011 15:00	TP13 (0-0.1)						✓
EM1100640-007	19-JAN-2011 15:00	TP13 (0.3-0.35)			✓			✓
EM1100640-008	19-JAN-2011 15:00	TP13 (0.8-0.85)			✓			✓
EM1100640-009	19-JAN-2011 15:00	TP13 (2.3-2.4)	✓					
EM1100640-010	19-JAN-2011 15:00	TP14 (0.1-0.15)			✓			✓
EM1100640-011	19-JAN-2011 15:00	TP14 (0.5-0.6)			✓			✓
EM1100640-012	19-JAN-2011 15:00	TP14 (0.85-0.9)						✓
EM1100640-013	19-JAN-2011 15:00	TP14 (1.75-1.8)	✓					
EM1100640-014	19-JAN-2011 15:00	TP15 (0-0.1)		✓			✓	✓
EM1100640-015	19-JAN-2011 15:00	TP15 (0.5-0.6)			✓			✓
EM1100640-016	19-JAN-2011 15:00	TP15 (1-1.1)						✓
EM1100640-017	19-JAN-2011 15:00	TP15 (2.4-2.5)	✓					
EM1100640-018	19-JAN-2011 15:00	TP16 (0.05-0.15)		✓			✓	✓
EM1100640-019	19-JAN-2011 15:00	TP16 (0.4-0.5)						✓
EM1100640-020	19-JAN-2011 15:00	TP16 (1-1.1)			✓			✓
EM1100640-021	19-JAN-2011 15:00	TP16 (2-2.1)	✓					
EM1100640-022	20-JAN-2011 15:00	TP17 (0-0.1)						✓
EM1100640-023	20-JAN-2011 15:00	TP17 (0.3-0.4)			✓			✓
EM1100640-024	20-JAN-2011 15:00	TP17 (1.0-1.1)						✓
EM1100640-025	20-JAN-2011 15:00	TP17 (2.2-2.3)	✓					
EM1100640-026	20-JAN-2011 15:00	TP18 (0-0.1)						✓
EM1100640-027	20-JAN-2011 15:00	TP18 (0.25-0.3)		✓	✓		✓	✓
EM1100640-028	20-JAN-2011 15:00	TP18 (0.7-0.8)		✓			✓	✓
EM1100640-029	20-JAN-2011 15:00	TP19 (0-0.1)						✓
EM1100640-030	20-JAN-2011 15:00	TP19 (0.3-0.4)						✓
EM1100640-031	20-JAN-2011 15:00	TP19 (0.6-0.7)			✓			✓
EM1100640-032	20-JAN-2011 15:00	TP20 (0.1-0.2)						✓
EM1100640-033	20-JAN-2011 15:00	TP20 (0.6-0.7)		✓	✓		✓	✓
EM1100640-034	20-JAN-2011 15:00	TP20 (0.8-0.9)		✓	✓	✓	✓	✓
EM1100640-035	20-JAN-2011 15:00	TP21 (0-0.1)		✓			✓	✓

			(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100640-036	20-JAN-2011 15:00	TP21 (0.45-0.5)		✓	✓		✓	✓
EM1100640-037	20-JAN-2011 15:00	TP20 (2.1-2.2)	✓					

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1100641**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 3
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-JAN-2011	Issue Date	: 24-JAN-2011 16:19
Client Requested Due Date	: 31-JAN-2011	Scheduled Reporting Date	: **31-JAN-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 15.4-18.6 - Ice bricks present
No. of coolers/boxes	: 3	No. of samples received	: 32
Security Seal	: Intact.	No. of samples analysed	: 28

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- **This is a split batch of EM1100639 & EM1100640.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.

Method / Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
EG020A-F : Dissolved Metals by ICP-MS - Suite A		
Rinsate (1)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Rinsate (2)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Rinsate (3)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
EG035F : Dissolved Mercury by FIMS		
Rinsate (1)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Rinsate (2)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered
Rinsate (3)	- Clear Plastic Bottle - Natural	- Clear Plastic Bottle - Nitric Acid; Filtered

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100641-001	20-JAN-2011 15:00	TP21 (0.8-0.9)						✓
EM1100641-002	20-JAN-2011 15:00	TP22 (0-0.1)						✓
EM1100641-003	20-JAN-2011 15:00	TP22 (0.3-0.4)			✓			✓
EM1100641-004	20-JAN-2011 15:00	TP22 (0.6-0.7)	✓					
EM1100641-005	20-JAN-2011 15:00	TP22 (2.4-2.5)	✓					
EM1100641-006	20-JAN-2011 15:00	TP23 (0-0.1)						✓
EM1100641-007	20-JAN-2011 15:00	TP23 (0.4-0.5)			✓			✓
EM1100641-008	20-JAN-2011 15:00	TP23 (1-1.1)						✓
EM1100641-009	20-JAN-2011 15:00	TP24 (0-0.1)						✓
EM1100641-010	20-JAN-2011 15:00	TP24 (0.5-0.6)			✓			✓
EM1100641-011	20-JAN-2011 15:00	TP24 (1.1-1.2)						✓
EM1100641-012	20-JAN-2011 15:00	TP24 (2.1-2.2)	✓					
EM1100641-013	20-JAN-2011 15:00	TP25 (0-0.1)						✓
EM1100641-014	20-JAN-2011 15:00	TP25 (0.7-0.8)			✓	✓		✓
EM1100641-015	20-JAN-2011 15:00	TP25 (1.2-1.3)						✓
EM1100641-016	20-JAN-2011 15:00	TP26 (0-0.1)						✓
EM1100641-017	20-JAN-2011 15:00	TP26 (0.5-0.6)		✓	✓	✓	✓	✓
EM1100641-018	20-JAN-2011 15:00	TP26 (1.8-1.9)		✓	✓	✓	✓	✓
EM1100641-019	20-JAN-2011 15:00	TP26 (2.5-2.6)				✓		✓
EM1100641-026	18-JAN-2011 15:00	DUP1			✓			✓
EM1100641-027	18-JAN-2011 15:00	DUP2		✓	✓		✓	✓
EM1100641-028	19-JAN-2011 15:00	DUP3			✓			✓
EM1100641-029	20-JAN-2011 15:00	DUP4						✓
EM1100641-030	20-JAN-2011 15:00	DUP5						✓
EM1100641-031	20-JAN-2011 15:00	DUP6	✓					
EM1100641-032	20-JAN-2011 15:00	DUP7						✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-02 8 Metals	WATER - W-18 TPH(C6 - C9)/BTEX
EM1100641-020	18-JAN-2011 15:00	Rinsate (1)	✓	✓
EM1100641-021	19-JAN-2011 15:00	Rinsate (2)	✓	✓
EM1100641-022	20-JAN-2011 15:00	Rinsate (3)	✓	✓
EM1100641-023	18-JAN-2011 15:00	Trip 1		✓
EM1100641-024	19-JAN-2011 15:00	Trip 2		✓
EM1100641-025	20-JAN-2011 15:00	Trip 3		✓

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1100885**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 3
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: JI, JF	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 28-JAN-2011	Issue Date	: 01-FEB-2011 13:31
Client Requested Due Date	: 16-FEB-2011	Scheduled Reporting Date	: **16-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 15.2-17.4 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 35
Security Seal	: Intact.	No. of samples analysed	: 31

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne and Brisbane.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100885-001	27-JAN-2011 15:00	BH1 (0-0.1)						✓
EM1100885-002	27-JAN-2011 15:00	BH1 (0.3-0.4)			✓			✓
EM1100885-003	27-JAN-2011 15:00	BH1 (1-1.1)						✓
EM1100885-004	27-JAN-2011 15:00	BH1 (1.6-1.7)	✓					
EM1100885-005	27-JAN-2011 15:00	BH2 (0-0.1)						✓
EM1100885-006	27-JAN-2011 15:00	BH2 (0.2-0.3)		✓	✓		✓	✓
EM1100885-007	27-JAN-2011 15:00	BH2 (0.9-1)		✓			✓	✓
EM1100885-008	27-JAN-2011 15:00	BH2 (1.2-1.3)	✓					
EM1100885-009	27-JAN-2011 15:00	BH3 (0-0.1)						✓
EM1100885-010	27-JAN-2011 15:00	BH3 (0.2-0.3)			✓			✓
EM1100885-011	27-JAN-2011 15:00	BH3 (0.6-0.7)		✓	✓		✓	✓
EM1100885-012	27-JAN-2011 15:00	BH4 (0-0.1)						✓
EM1100885-013	27-JAN-2011 15:00	BH4 (0.2-0.3)			✓			✓
EM1100885-014	27-JAN-2011 15:00	BH4 (0.6-0.7)		✓		✓	✓	✓
EM1100885-015	27-JAN-2011 15:00	BH5 (0-0.1)		✓			✓	✓
EM1100885-016	27-JAN-2011 15:00	BH5 (0.2-0.3)		✓	✓		✓	✓
EM1100885-017	27-JAN-2011 15:00	BH5 (0.6-0.7)		✓	✓	✓	✓	✓
EM1100885-018	27-JAN-2011 15:00	BH6 (0-0.1)						✓
EM1100885-019	27-JAN-2011 15:00	BH6 (0.3-0.4)			✓			✓
EM1100885-020	27-JAN-2011 15:00	BH6 (1.7-1.8)			✓			✓
EM1100885-021	27-JAN-2011 15:00	BH7 (0-0.1)						✓
EM1100885-022	27-JAN-2011 15:00	BH7 (0.3-0.4)		✓	✓		✓	✓
EM1100885-023	27-JAN-2011 15:00	BH7 (0.6-0.7)		✓	✓	✓	✓	✓
EM1100885-024	27-JAN-2011 15:00	BH7 (1.4-1.5)	✓					
EM1100885-025	27-JAN-2011 15:00	BH8 (0-0.1)						✓
EM1100885-026	27-JAN-2011 15:00	BH8 (0.3-0.4)			✓			✓
EM1100885-027	27-JAN-2011 15:00	BH8 (1.4-1.5)		✓		✓	✓	✓
EM1100885-028	27-JAN-2011 15:00	BH9 (0.2-0.3)						✓
EM1100885-029	27-JAN-2011 15:00	BH9 (0.9-1.0)			✓			✓
EM1100885-030	27-JAN-2011 15:00	BH9 (1.4-1.5)						✓
EM1100885-031	27-JAN-2011 15:00	BH13 (0-0.1)						✓
EM1100885-032	27-JAN-2011 15:00	BH13 (0.3-0.4)		✓	✓		✓	✓
EM1100885-033	27-JAN-2011 15:00	BH14 (0.05-0.15)		✓			✓	✓
EM1100885-034	27-JAN-2011 15:00	DUP1						✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) WATER No analysis requested
EM1100885-035	27-JAN-2011 15:00	Trip 4	✓

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

- *AU Certificate of Analysis - NATA (COA)	Email	djames@eesi.biz
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	djames@eesi.biz
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- EDI Format - ESDAT (ESDAT)	Email	djames@eesi.biz

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1100937**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 2
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: JI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 01-FEB-2011	Issue Date	: 02-FEB-2011 17:50
Client Requested Due Date	: 17-FEB-2011	Scheduled Reporting Date	: **17-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 10-12 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 12
Security Seal	: Intact.	No. of samples analysed	: 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne and Brisbane.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - ED040N Calcium Phosphate Extractable Sulfate	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK085 Sulfide as S	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1100937-001	28-JAN-2011 15:00	BH10 (0.2-0.3)		✓	✓	✓	✓
EM1100937-002	28-JAN-2011 15:00	BH10 (1-1.1)					✓
EM1100937-003	28-JAN-2011 15:00	BH10 (1.6-1.7)					✓
EM1100937-004	28-JAN-2011 15:00	BH11 (0.5-0.6)					✓
EM1100937-005	28-JAN-2011 15:00	BH11 (1.3-1.4)					✓
EM1100937-006	28-JAN-2011 15:00	BH11 (2.3-2.4)	✓				
EM1100937-007	28-JAN-2011 15:00	BH11 (2.5-2.6)	✓				
EM1100937-008	28-JAN-2011 15:00	BH15 (0-0.1)					✓
EM1100937-009	28-JAN-2011 15:00	BH15 (0.4-0.5)			✓		✓
EM1100937-010	28-JAN-2011 15:00	BH15 (0.8-0.9)					✓
EM1100937-011	28-JAN-2011 15:00	BH15 (1.2-1.3)	✓				
EM1100937-012	28-JAN-2011 15:00	BH15 (2.4-2.5)	✓				

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1101370**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 2
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: JF, VR	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 11-FEB-2011	Issue Date	: 14-FEB-2011 13:04
Client Requested Due Date	: 18-FEB-2011	Scheduled Reporting Date	: **18-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 18.8-22.6
No. of coolers/boxes	: 1	No. of samples received	: 9
Security Seal	: Intact.	No. of samples analysed	: 8

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) SOIL No analysis requested	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1101370-001	10-FEB-2011 15:00	BH16(0.2-0.3)		✓	✓
EM1101370-002	10-FEB-2011 15:00	BH16(0.7-0.8)			✓
EM1101370-003	10-FEB-2011 15:00	BH13(0.1-0.4)		✓	✓
EM1101370-004	10-FEB-2011 15:00	BH13(0.6-0.7)			✓
EM1101370-005	10-FEB-2011 15:00	BH13(1.1-1.3)			✓
EM1101370-006	10-FEB-2011 15:00	BH14(0.7-0.8)			✓
EM1101370-007	10-FEB-2011 15:00	BH14(0.4-0.5)		✓	✓
EM1101370-008	10-FEB-2011 15:00	BH14(1.3-1.4)			✓
EM1101370-009	10-FEB-2011 15:00	DUP8	✓		

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EM1101415**

Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: ALBERT PARK GAS WORKS	Page	: 1 of 2
Order number	: 210074		
C-O-C number	: ----	Quote number	: EM2011ENVEAR0210 (ME/015/11)
Site	: ----		
Sampler	: JF/VR	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 11-FEB-2011	Issue Date	: 15-FEB-2011 13:25
Client Requested Due Date	: 22-FEB-2011	Scheduled Reporting Date	: **22-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 18.8-22.6
No. of coolers/boxes	: 1	No. of samples received	: 1
Security Seal	: Intact.	No. of samples analysed	: 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - S-27 TPH/BTEX/PAH/Phenols/8Metals
EM1101415-001	10-FEB-2011 15:00	DUP8	✓

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MS CAROL WALSH

- Chain of Custody (CoC) (COC)	Email	carol.walsh@alsenviro.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1101775**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR DAVID JAMES	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: djames@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074 REBATCH EM1101370 EM1100937	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2010ENVEAR0204 (EN/010/10)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-FEB-2011	Issue Date	: 23-FEB-2011 17:03
Client Requested Due Date	: 28-FEB-2011	Scheduled Reporting Date	: **28-FEB-2011**

Delivery Details

Mode of Delivery	: Samples on hand	Temperature	: ----
No. of coolers/boxes	: ----	No. of samples received	: 2
Security Seal	: Intact.	No. of samples analysed	: 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EP070 (Water) TPH Speciation - Aliphatic & Aromatic Hydrocarbons C10-C35	SOIL - EP075 SIM PAH only SIM - PAH only
EM1101775-001	10-FEB-2011 15:00	BH14(0.4-0.5)		✓
EM1101775-002	10-FEB-2011 15:00	BH11(0.5-0.6)		✓
	28-JAN-2011 15:00	BH11(0.5-0.6)	✓	

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **EM1102076**		
Client	: **ENVIRONMENTAL EARTH SCIENCES**	Laboratory	: Environmental Division Melbourne
Contact	: MR SHANE FURLONG	Contact	: Carol Walsh
Address	: P.O.BOX 2253 FOOTSCRAY VIC, AUSTRALIA 3011	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: sfurlong@eesi.biz	E-mail	: carol.walsh@alsenviro.com
Telephone	: +61 03 96871666	Telephone	: +61-3-8549 9608
Facsimile	: +61 03 96871844	Facsimile	: +61-3-8549 9601
Project	: 210074	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2010ENVEAR0204 (EN/010/10)
Site	: PORT MELBOURNE		
Sampler	: SM, SF	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 02-MAR-2011	Issue Date	: 11-MAR-2011 16:54
Client Requested Due Date	: 21-MAR-2011	Scheduled Reporting Date	: **21-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.2-5.4 - Ice present
No. of coolers/boxes	: 1	No. of samples received	: 14
Security Seal	: Intact.	No. of samples analysed	: 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times**
- **Please direct any queries related to sample condition / numbering / breakages to Peter Ravlic.**
- **Analytical work for this work order will be conducted at ALS Melbourne.**
- Sample Disposal - Aqueous (14 days), Solid (90 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.
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.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EK055 (solids) Ammonia as N	SOIL - S-07 TPH/BTEX/PAH (SIM)
EM1102076-001	28-FEB-2011 15:00	GW38(8.0-8.1)	✓		
EM1102076-002	01-MAR-2011 15:00	GW38(11.0-11.1)		✓	✓
EM1102076-004	28-FEB-2011 15:00	GW38(1.3-1.5)	✓		
EM1102076-005	01-MAR-2011 15:00	GW37(11.0-11.1)		✓	✓
EM1102076-006	01-MAR-2011 15:00	GW37(8m)	✓		
EM1102076-007	01-MAR-2011 15:00	GW39(8.0-8.1)	✓		
EM1102076-008	01-MAR-2011 15:00	GW39(11.4-11.5)		✓	✓
EM1102076-010	28-FEB-2011 15:00	GW41(0.1-0.2)	✓		
EM1102076-011	28-FEB-2011 15:00	GW42(D)(1.5-1.6)	✓		
EM1102076-012	28-FEB-2011 15:00	GW43(D)(4.0-4.1)	✓		
EM1102076-013	28-FEB-2011 15:00	GW40(11.1-11.2)	✓		
EM1102076-014	28-FEB-2011 15:00	GW40(10-10.1)	✓		
EM1102076-015	28-FEB-2011 15:00	GW40(10-10.5)	✓		
EM1102076-016	28-FEB-2011 15:00	GW41(11.0-11.1)	✓		

Requested Deliverables

ALL INVOICES MELB ADDRESS

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

MR DAVID JAMES

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

MR SHANE FURLONG

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