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Barangaroo
Lend Lease (Millers Point) Pty Ltd
9 March 2012

Supplementary Data Gap Investigation

VMP Area, Hickson Road, Millers Point, NSW

Supplementary Data Gap Investigation

VMP Area, Hickson Road, Millers Point, NSW

Prepared for

Lend Lease (Millers Point) Pty Ltd

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Quality Information

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Glossary of Terms

Term	Description
AHD	Australian Height Datum
Ag	Silver
Al	Aluminium
ALS	ALS Environmental
ANZECC	Australian and New Zealand Environment and Conservation Council
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soil Management Plan
AS	Australian Standard
As	Arsenic
BaP	Benzo(a) pyrene
BDA	Barangaroo Delivery Authority
BH	Borehole Location
BTEX	Benzene, Toluene, Ethyl benzene and Xylenes
Cd	Cadmium
Cr	Chromium
CoPC	Chemicals of Potential Concern
Cr 6+/ Cr VI	Hexavalent Chromium
Cu	Copper
DEC	Department of Environment and Conservation NSW (superseded)
DECC	Department of Environment and Climate Change NSW (superseded)
DGI	Data Gap Investigation
DP	Deposited Plan
DQO	Data Quality Objectives
DQI	Data Quality Indicators
EC	Electrical Conductivity
EE	Excavation Enclosure
EIL	Ecological Investigation Level
EMP	Environment Management Plan
EPA	Environmental Protection Authority
ESA	Environmental Site Assessment
GIL	Groundwater Investigation Level
GME	Groundwater Monitoring Event
GPS	Global Positioning System
Hg	Mercury
HIL	Health Investigation Level

Term	Description
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
m bgs	Metres below ground surface
mbTOC	Metres below top of casing
MW	Monitoring Well Location
Lend Lease	Lend Lease (Millers Point) Pty Limited
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	(National Environmental Protection (Assessment of Site Contamination) Measure
Ni	Nickel
NHMRC	National Health and Medical Research Council
OHS/OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PDA	Project Development Agreement
Pb	Lead
PSI	Preliminary Site Assessment
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RWP	Remediation Work Plan
SAQP	Sampling Analysis and Quality Plan
Soil Investigation Criteria	Soil Acceptance Criteria
SHFA	Sydney Harbour Foreshore Authority
Sb	Antimony
Se	Selenium
SIL	Soil Investigation Level
S-ISCO	Surfactant Enhanced In-Situ Chemical Oxidation
SROH	Significant Risk of Harm
SWL	Standing Water Level
SVOC	Semi Volatile Organic Compound
TPH	Total Petroleum Hydrocarbons
VMP	Voluntary Management Proposal
VOC	Volatile Organic Compound
US EPA	United States Environment Protection Agency
VENM	Virgin Excavated Natural Material
Zn	Zinc

Term	Description		
Units of Measurement			
°C	degrees Celsius	m	Metres
cm	centimetre	mS	milli-Siemens
ha	hectare	mV	Mill volts
kg	kilogram	ppm	parts per million
km	kilometre	µg	Microgram
		%	Percent

Executive Summary

AECOM Australia Pty Limited (AECOM) was engaged by Lend Lease (Millers Point) Pty Limited (Lend Lease) to undertake a Supplementary Data Gap Investigation (DGI) for the Voluntary Management Plan (VMP) area which is partly located within the Stage 1 Barangaroo Development Area, Hickson Road, NSW (hereafter referred to as the Overall Site).

The Supplementary VMP DGI was undertaken to:

- Provide data for improved delineation of the vertical and lateral extent of identified contaminated materials around (both within and outside) the NSW Environment Protection Authority (EPA) Declaration Area (hereafter referred to as 'the VMP Area'), to assess whether these impacts will require remediation to facilitate removal of the EPA Declaration; and
- To provide spatial data closer to the VMP Area than the previous Groundwater Discharge Study (DGS) and laterally behind the existing caisson wall (including other areas of the Overall Site as described below), to build on the current data and support the assumptions made and for the VMP HHERA regarding the conceptual fate and transport of contamination.

For the purposes of this investigation "the Site" refers to the boreholes and groundwater monitoring wells sampled for this investigation, which are located within the VMP Area and the following adjacent areas of the Overall Site:

- The Other Remediation Works North Area (ORWN); and
- The Other Remediation Works South Area (ORWS).

Figure F1 shows the location of the VMP Area and **Figure F2** shows the layout of the Overall Site in Appendix A.

The objective of the Supplementary VMP DGI was to obtain data that would enable the VMP RAP to:

- Refine the extent of remediation works required within the VMP Area and the potential extent of remediation works or barrier walls required associated with a 30 m Remediation Buffer Zone (RBZ[1]) outside the VMP Area (refer to Figure F2 in Appendix A for RBZ area).
- Further assess groundwater quality immediately down gradient of the VMP Area, in support of demonstrating whether the VMP Area represents an unacceptable risk to the environment in its current condition.
- Assess the opportunity for beneficial reuse of materials that might be removed from the VMP Area as part of the remediation;

The objective was also to inform the risk assessment process with respect the nature and extent of contaminant discharge from the Overall Site to Darling Harbour, including likely contaminant concentrations at the point of discharge and an indication of overall contaminant mass flux by providing spatial data closer to the VMP Area and laterally behind the existing caisson wall.

The following main scope of work was undertaken to achieve the objectives as per AECOMs original proposed scope of work:

- A total of 14 boreholes (BH400 to BH413) were advanced and sampled to bedrock across the Site (locations are shown on **Figure F2 in** Appendix A);
- Conversion of one borehole into a groundwater monitoring well (BH401/MW401) and five boreholes into bundled piezometers (BH405/IT03, BH410/IT04, BH411/IT05, BH412/IT06 and BH413/IT07) (locations are shown on **Figure F2 in** Appendix A);
- Development of all new groundwater monitoring wells;
- Surveying of the top of casing of monitoring wells following completion;

[1] The Remediation Buffer Zone has been defined as a 30 metre zone around the Declaration Area that must either meet the Declaration Area remediation criteria or be isolated from the Declaration Area (e.g. placement of a physical barrier at the Declaration Area boundary) so that the migration of vapour from contaminated soil or groundwater back onto the Declaration Area following remediation will not occur. It is based on the NSW DECCW Vapour Migration Practice Note (2010) and the United States Environmental Protection Agency (USEPA, 2002) guidance.

- Gauging of groundwater levels at each new location and selected existing AECOM and ERM monitoring well locations (where tar was not present);
- Groundwater sampling of four existing monitoring wells (MW62, MW68, MW69 and MW210) and six newly installed monitoring wells (MW401, IT03, IT04, IT05, IT06 and IT07); and
- Analysis of selected soil and groundwater samples for the following contaminants of concern by NATA accredited laboratories (ALS and LabMark).

The following additional scope of work was undertaken to provide data required for the HHERA during the course of the Supplementary VMP DGI:

- Leachability (Toxicity Characteristic Leaching Procedure [TCLP] and Australian Standard Leaching Procedure [ASLP]) analysis of selected soil samples collected from BH400 to BH413;
- Analysis of selected soil samples for phenols;
- Groundwater sampling of groundwater from five additional monitoring wells (MW198, MW200, MW204S, MW209 and MW08);
- Standard laboratory analysis of additional groundwater samples from the five additional monitoring wells;
- Laboratory analysis following laboratory double filtering of selected groundwater samples (filtrate analysis); and
- Laboratory analysis of residue on filter papers from all filtrate samples for PAHs and phenols.

The Supplementary VMP DGI has made the following main findings:

- Tar impacted soil was identified at and below the fill and natural soil interface in boreholes BH400 to BH406, located in the 30 m RBZ.
- Concentrations of CoPC including lead, TPH, BTEX, and PAHs exceeded the soil investigation criteria at each location (BH400 to BH413), with the exception of BH412.
- Observations of contamination and PID readings were consistent with analytical results.
- Asbestos fibre bundles were identified in fill materials BH405 and BH401. Potential asbestos containing material such as fibre cement fragments were not observed in any sample collected.
- Concentrations of CoPC variably exceeded the adopted groundwater assessment criteria in existing and newly installed monitoring wells, with the highest concentrations within the vicinity of the VMP area and RBZ.

AECOM considers that this supplementary DGI has provided sufficient data and information for the RAP to refine the extent of remediation works required within the VMP Area and the potential extent of remediation works or barrier walls associated with a 30 m RBZ outside the VMP Area.

AECOM also considers that sufficient data and information have been obtained to provide spatial data closer to the VMP Area and laterally behind the existing caisson wall which will inform the risk assessment process with respect the nature and extent of contaminant discharge from the Site to Darling Harbour including likely contaminant concentrations at the point of discharge and an indication of overall contaminant mass flux.

Conclusions regarding the recommended extent of remediation works required for removal of the EPA Declaration will be provided in the VMP RAP to be prepared for the VMP Area.

1.0 Introduction

AECOM Australia Pty Limited (AECOM) was engaged by Lend Lease (Millers Point) Pty Limited (Lend Lease) to undertake a Supplementary Data Gap Investigation (DGI) for the Voluntary Management Plan (VMP) area which is located within the Stage 1 Barangaroo Development Area, Hickson Road, NSW (hereafter referred to as the Overall Site).

The Supplementary VMP DGI was undertaken to:

- Provide data for improved delineation of the vertical and lateral extent of identified contaminated materials around (both within and outside) the NSW Environment Protection Authority (EPA) Declaration Area (hereafter referred to as 'the VMP Area'), to assess whether these impacts will require remediation to facilitate removal of the EPA Declaration; and
- To provide spatial data closer to the VMP Area than the previous Groundwater Discharge Study (DGS) and laterally behind the existing caisson wall, to build on the current data and support the assumptions made and for the VMP HHERA regarding the conceptual fate and transport of contamination.

For the purposes of this investigation "the Site" refers to the boreholes and groundwater monitoring wells sampled for this investigation, which are located within the VMP area and the following adjacent areas of the Overall Site:

- The Other Remediation Works North Area (ORWN)[2]; and
- The Other Remediation Works South Area (ORWS).

Figure F1 shows the location of the VMP Area and **Figure F2** shows the layout of the Overall Site including the VMP, the ORWN and ORWS Areas. These figures are provided in Appendix A.

1.1 Purpose and Objectives

The objective of the Supplementary VMP DGI was to obtain data that would enable the VMP RAP to:

- Refine the extent of remediation works required within the VMP Area and the extent of remediation works required within a 30 m Remediation Buffer Zone (RBZ[3]) outside the VMP Area (refer to Figure F2 in Appendix A for RBZ area);
- Further assess groundwater quality immediately down gradient of the VMP Area, in support of demonstrating whether the VMP Area represents an unacceptable risk to the environment in its current condition; and
- Assess the opportunity for beneficial reuse of materials that might be removed from the VMP Area as part of the remediation.

The objective was also to inform the risk assessment process with respect the nature and extent of contaminant discharge from the Overall Site to Darling Harbour including likely contaminant concentrations at the point of discharge and an indication of overall contaminant mass flux by providing spatial data closer to the VMP Area and laterally behind the existing caisson wall.

1.2 Data Quality Objectives

In determining the type, quantity and quality of data needed to support decisions relating to the environmental condition of the Site, AECOM adopted the seven-step process to develop the DQOs in accordance with NSW DEC (2006) in the SAQP (AECOM, 2010a).

In developing the DQOs for the investigation, an initial phase of review was undertaken to appraise relevant and available background information and to develop a preliminary conceptual site contamination model identifying the

[2] Including Public Domain and the proposed Southern Cove.
[3] The Remediation Buffer Zone has been defined as a 30 metre zone around the Declaration Area that must either meet the Declaration Area remediation criteria or be isolated from the Declaration Area (e.g. placement of a physical barrier at the Declaration Area boundary) so that the migration of vapour from contaminated soil or groundwater back onto the Declaration Area following remediation will not occur. It is based on the NSW DECCW Vapour Migration Practice Note (2010) and the United States Environmental Protection Agency (USEPA, 2002) guidance.

areas of the Site that required investigation for the purpose of assessing the requirements for either the management and/or remediation to remove the declaration. The DQOs are discussed in Appendix C .

1.3 Scope of Work

The following scope of work was undertaken to achieve the objectives as per AECOM's original proposed scope of work:

- Pre-drilling survey of borehole locations to confirm locations with respect to previous investigations (i.e. to ensure they are located in the identified data gap areas);
- Underground service location was conducted across the Site, including the marking and clearing of proposed intrusive works locations;
- Following service clearance, all locations were concrete cored and air knifed to a depth of one metre below ground surface (m bgs) to further minimise the risk of striking underground services;
- A total of 14 boreholes (BH400 to BH413) were advanced and sampled to bedrock across the Site (locations are shown on **Figure F2 in** Appendix A);
- Conversion of one borehole into a groundwater monitoring well (BH401/MW401) and five boreholes into bundled piezometers (BH405/IT03, BH410/IT04, BH411/IT05, BH412/IT06 and BH413/IT07) (locations are shown on **Figure F2 in** Appendix A);
- Development of all new groundwater monitoring wells;
- Surveying of the top of casing and nearest ground level of monitoring wells following completion;
- Gauging of groundwater levels at each new location and selected existing AECOM and ERM monitoring well locations (where tar was not present);
- Groundwater sampling of four existing monitoring wells (MW62, MW68, MW69 and MW210), one newly installed monitoring well (MW401) and five newly installed multi level piezometers (IT03, IT04, IT05, IT06 and IT07);
- Analysis of selected soil samples for the following contaminants of concern:
    - Heavy metals (arsenic, cadmium, copper, chromium, nickel, lead, mercury and zinc)
    - Total petroleum hydrocarbons (TPH)
    - Benzene, toluene, ethylbenzene and xylenes (BTEX)
    - Polycyclic aromatic hydrocarbons (PAHs)
    - Free and weak acid dissociable (WAD) cyanide
- Analysis of all groundwater samples for the following contaminants of concern:
    - Heavy metals (Ag, Al, As, Ba, Be, Cd, Cr, Co, Cu, Mn, Hg, Ni, Pb, Sb, Se, V and Zn)
    - TPH and BTEX
    - PAHs and phenols
    - Free and WAD cyanide
- Laboratory analysis of samples was conducted by National Association of Testing Authorities (NATA) certified methods using NATA accredited laboratories (ALS and LabMark).

The following additional scope of work was undertaken to provide data required for the HHERA during the course of the Supplementary VMP DGI:

- Leachability (Toxicity Characteristic Leaching Procedure [TCLP] and Australian Standard Leaching Procedure [ASLP]) analysis of selected soil samples collected from BH400 to BH413 for metals, TPH, BTEX, TPH, PAH and phenols;
- Analysis of selected soil samples for phenols;

- Groundwater sampling of groundwater from five additional monitoring wells (MW198, MW200, MW204S, MW209 and MW08);
- Standard laboratory analysis of additional groundwater samples from the five additional monitoring wells for the heavy metals, BTEX, TPH; PAHs, phenols, free and WAD cyanide;
- Laboratory analysis following twice laboratory filtering of selected groundwater samples (filtrate analysis) for PAHs, phenols, TPH, BTEX, heavy metals and free and WAD cyanide;
- Laboratory analysis of residue on filter papers from all filtrate samples for PAHs and phenols.

Note that the additional data acquired during this Supplementary VMP DGI for the HHERA is presented in **Tables T7 to T9** and is provided in laboratory certificates in Appendix H and with the exception of sampling and analysis methodologies, is not further discussed in this report.

2.0 Site Identification

The following table provides Site identification details.

Table 1 Site Identification Details

Item	Description
Site Owner	The Barangaroo Delivery Authority (BDA)
Client	Lend Lease (Millers Point) Pty Ltd (Lend Lease)
Site Address	Wharf 8, Hickson Road (Sussex Street), Barangaroo, NSW 2000
Legal Description (Lot and DP)	Part Lot 5 and Part Lot 3 in Deposited Plan 876514 Section of Hickson Road in State Plan 118 and 162
County and Parish	County of Cumberland, Parish of Saint Phillip
Planning Authority	NSW Department of Planning and Infrastructure
Current Zoning	Mixed Use and Public Recreation
Current Land Use	Vacant. Partial access for public recreation (waking and bike riding).
Approximate Average Elevation	2 - 3 m AHD
Site Location	Figure F1 (Appendix A)
Site Layout	Figure F2 (Appendix B)

Notes:

AHD – Australian Height Datum

[a] – State Environmental Planning Policy (SEPP) Major Development Amendment (Barangaroo) 2010 No 692

[b] – NSW Department of Planning 2007. Appendix 4 In: *State Environmental Planning Policy (Major Projects) 2005 (Amendment No 19),* Gazetted 12 October 2007.

3.0 Previous Investigations

A number of previous investigations have been undertaken within the Overall Site by AECOM and other consultants between 1986 and 2011 and are summarised in **Section 3.1** below.

Previous investigations undertaken by AECOM are summarised in more detail in **Sections 3.2 to 3.6**.

3.1 Summary of Previous Investigations

Previous investigations relating to the Barangaroo site and adjacent areas are summarised in Table 2 below.

Table 2 Summary of Previous Investigations

Date of Publication	Consultant	Report Title and Key Issues
January, 1986	ARUP Geotechnics	Upgrading Wharf 7/8 Darling Harbour, Geotechnical Site Investigation – detail of rock/soil design parameters, geotechnical analysis and recommendations on foundations for proposed development of Wharves 7 and 8.
June, 1996	Noel Arnold & Associates Pty Ltd	Initial Environmental Assessment, Sydney Ports Corporation, Darling Harbour Berths 3-8 Hickson Road, Darling Harbour – details results of an initial contamination assessment and provides options for remedial management of the site. Known and potential contamination was not determined to be a risk to the ongoing use of the site by the then occupant providing subsurface materials were not disturbed. Impact was identified in the area of the former gas works.
March, 1998	Coffey Partners International Pty Ltd	Wharf 8 Darling Harbour Environmental Soil Quality Assessment – A limited site assessment including soil sampling at Wharf 8 to identify contamination and provide options for disposal of excavated soil associated with proposed development. The Environmental Site Assessment (ESA) reported low level polycyclic aromatic hydrocarbons (PAH) contamination and identified material required for offsite disposal that would likely require industrial or hazardous waste classification.
July, 2001	URS Australia Pty Ltd	Contamination Review for Darling Harbour – Berths 3/8 – Comprised a review of the contamination issues collated from 11 reports produced between 1993 and 2001. The review identified soil and groundwater contamination associated with the former gas works, including offsite migration and soil contamination associated with current vehicle maintenance operations.
August, 2006	Jeffery and Katauskas Pty Ltd	*Geotechnical Investigation for Proposed Redevelopment of Wharves 3-8 at Hickson Road, Darling Harbour East, NSW* – Geotechnical investigation intended to identify the subsurface conditions of the site in preparation for the proposed redevelopment.
June, 2007	ERM Australia Pty Ltd	*Environmental Site Assessment, East Darling Harbour, Sydney, NSW Final Report – Revision 1* – ESA intended to identify and report the environmental site conditions in preparation for the development planning. Works included the completion of a Stage 1 Investigation and Stage 2 ESA comprising drilling and sampling of soils and groundwater at 150 locations (inclusive of Lots 1, 2 , 4 and Northern portion of Lot 5). CoPC were identified in groundwater in the vicinity of the former gas works.
May 2008	Coffey Environments Pty Ltd	Preliminary environmental investigation at 30-38 Hickson Road, conducted for the City of Sydney Council. Included the drilling and sampling of 15 boreholes and the installation of 6 groundwater monitoring wells. Area of investigation included Hickson Road and the courtyard area between 30 and 38 Hickson Road.

Date of Publication	Consultant	Report Title and Key Issues
July, 2008	ERM Australia Pty Ltd	*Additional Investigation Works at Barangaroo, Hickson Road, Millers Point, NSW – Revision 3* – intended to address data gaps remaining following the Stage 2 ESA and included an additional 55 boreholes and construction of 13 monitoring wells across the site (inclusive of Lots 1, 2 , 4 and Northern portion of Lot 5). The report identified the former gas works and reclaimed areas between the finger wharves as key areas of concern. Exceedences of assessment criteria for soil were identified for lead, total petroleum hydrocarbons (TPH), PAH, benzene, toluene, ethylbenzene, xylenes (BTEX) and sulphate. The highest levels were identified in the vicinity of the former gas works and included the identification of phase separated hydrocarbons (PSH) in MW204D located within the gas works footprint.
August, 2008	ERM Australia Pty Ltd	*Preliminary Sediment Screening Works at East Darling Harbour, Adjacent to Barangaroo, NSW, Draft, Rev 03* – preliminary sediment screening works were conducted at East Darling Harbour to identify potential offsite migration of contamination from the Site to sediments in Darling Harbour. Sediments cores were collected from the Harbour adjacent to the Site along 7 transects. Screening identified PAH, tributyl tin (TBT) and metals exceeding ANZECC (2000) and elevated levels of organochlorine pesticides (OCPs) and TPH C_{10}-C_{36}.
May 2010	AECOM	Data Gap Investigation, Other Remediation Works (South) Area Hickson Road, Millers Point NSW (AECOM, 2010a). Refer to **Section 3.2** for further detail regarding the report findings.
September 2010	AECOM	Data Gap Investigation, EPA Declaration Area (Parts of Barangaroo Site and Hickson Road) , Millers Point NSW (AECOM, 2010b) Refer to **Section 3.3** for further detail regarding the report findings.
October 2010	AECOM	Data Gap Investigation, Other Remediation Works (North) Area, Hickson Road, Millers Point NSW (AECOM, 2010c) Refer to **Section 3.4** for further detail regarding the report findings.
November 2010	AECOM	Groundwater Discharge Study, Stage 1 Barangaroo Development, Hickson Road, Darling Harbour, NSW (AECOM, 2010d). Refer to **Section 3.5** for further detail regarding report findings.
May 2011	AECOM	In situ Soil and Fill Validation, Other Remediation Works South Area. Refer to **Section 3.6** for further detail regarding report findings.

3.2 AECOM (2010a)

AECOM was engaged by Lend Lease to undertake a DGI for the proposed Blocks 1, 2 and 3 (including associated Public Domain areas) within Stage 1 of the Barangaroo redevelopment precinct, that is immediately south of the current Site (also referred to as the ORWS Area).

The purpose of the DGI was to reduce uncertainties which existed in the available data set, confirm the characteristics of soil and groundwater underlying the site, provide the additional data required for a quantitative HHERA to be developed and facilitate the development of an RAP and RWP which describe the remediation strategy to be implemented by Lend Lease as part of its proposed Stage 1 Development of the Barangaroo Precinct.

The results of the DGI intrusive investigation are briefly summarised:

- Fill was encountered at the site overlying natural sands, gravelly sands, clays, weathered and sandstone bedrock. The fill was generally shallower (up to 3 meters below ground surface (mbgs) in the eastern portion of the site (near Hickson Road) and trending deeper (up to 19.2 mbgs) towards Darling Harbour.
- Soil impacts appeared to be associated with the historical presence of the former gasworks north of the site (located within the Site) and the presence of fill materials used for land reclamation activities.

- Soil vapour results indicated some gasworks-derived impacts in locations closest to the former gasworks area and low concentrations of CoPC (below soil vapour and ambient air guidelines) in some locations.
- Groundwater was present beneath the site within fill materials at approximately two metres below the ground surface and was subject to tidal fluctuation. Tidal influence extended as far east (inland) as Hickson Road.
- Groundwater impacts associated with the former gasworks infrastructure were limited to the north-eastern corner of the Blocks 1, 2 and 3 sites. Groundwater contamination associated with the remaining gasworks infrastructure located to the north of the Blocks 1, 2 and 3 site did not appear to be migrating into the harbour in the area of the site.

The DGI assessment of risk presented the following findings based on considerations of future land use and environment:

- ***Residential/Commercial Land Use at the development area***: Whilst the current asphaltic concrete and concrete ground surface was considered adequate to limit exposure by site users to underlying contamination, future earthworks/remediation/development at the Site may complete the exposure pathway.
- ***Passive Recreation Land Use at the Public Domain:*** The area designated as Public Domain is currently covered with concrete and/or asphalt concrete with no complete exposure pathway to underlying soil or groundwater. Given the limited extent of contamination identified within the Public Domain, AECOM considered this area of the site presents a low risk to human health in its current condition.
- ***Environment:*** The DGI identified potential risks to the down gradient environmental receptor (Darling Harbour). Based on the proposed development plan (i.e. excavation of basements), up gradient contaminant sources will be removed and therefore reduce the potential risk in the future.

The following recommendations were made:

- A RAP should be prepared to address hotspot remediation and potentially impacted materials that may be encountered during the excavation of the site for future development.
- Additional assessment of the materials should be undertaken in accordance with the RAP in the event that materials be encountered during the excavation and remediation works that are different to those found during the DGI and/or previous investigations.
- An Acid Sulfate Soil Management Plan may be required for the management of Potential Acid Sulfate Soils (PASS) during future excavation works in natural materials.

3.3 AECOM (2010b)

AECOM was engaged by Lend Lease to undertake a DGI for EPA Declaration Area 21122 (also known as the former Millers Point gasworks), at Hickson Road, Millers Point. This area is also variously designated as the: VMP and PDA Remediation Works Area; EPA Declaration Area; and the Declaration Site (Development Works) Remediation Works Area.

The purpose of the DGI was to reduce uncertainties which exist in the current data set, confirm the characteristics of soil and groundwater underlying the site, provide the additional data required if a quantitative HHERA is developed and facilitate the development of an RAP and RWP which describe the remediation strategy to be implemented by Lend Lease in order to address the significant contamination on the VMP and PDA Remediation Works Area (the Site) and as part of its proposed Stage 1 Development of the Barangaroo Precinct.

EPA had previously determined this area to be contaminated in such a way as to present a significant risk of harm to human health and the environment. The reported results of this DGI and previous investigations were found to support this determination.

The DGI confirmed that elevated concentrations of contaminants in soil and groundwater associated with the former gasworks site, notably BTEX, naphthalene and PAHs, were present in locations which included areas near the boundaries of the Declaration Area.

In summary, the DGI identified elevated concentrations of CoPC in soil and groundwater exceeding the adopted Site investigation criteria. The reported results were considered to be primarily associated with the area's former land use as a gas manufacturing plant and with the importation of fill materials to level the Site. The investigation reported free tar and other fill materials contaminated with CoPC in a number of locations within the former gasworks area, indicating these locations were source areas for contamination.

- The DGI recommended completion of the following:
    - Site-specific HHERA addressing remediation of the Site in order to address the significant contamination.
    - Site-specific HHERA addressing remediation for the proposed future land use.
    - RAP detailing options for remediation and/or management and recommended preferred strategy to facilitate removal of the EPA Declaration.
    - RAP detailing options for remediation and/or management and recommended preferred strategy to render the area suitable for their intended land use.

3.4 AECOM (2010c)

AECOM was engaged by Lend Lease to undertake a DGI of the Barangaroo Other Remediation Works (North) Area (ORWN Area). The ORWN Area covers that portion of the Barangaroo Block 4 which is outside the Declaration Area (including associated Public Domain areas).

The purpose of the DGI was to reduce uncertainties which exist in the current data set, confirm the characteristics of soil and groundwater underlying the site, provide the additional data required if a quantitative HHERA is developed and facilitate the development of an RAP and RWP which describe the remediation strategy to be implemented by Lend Lease as part of its proposed Stage 1 Development of the Barangaroo Precinct.

The results of the investigations conducted by AECOM and others across the ORWN Area indicated the following:

- Encountered fill depths ranged from 10.0 to 23.5 mbgs. Fill materials were generally shallower in the eastern portion of the ORWN site closest to Hickson Road and deeper in the western portion of the ORWN site closest to Darling Harbour.
- Natural soils encountered across the ORWN site comprised silty sands, gravelly sands, clays, weathered sandstone and sand with components of clay. Sandstone bedrock was encountered across the ORWN site with encountered depths ranging from 10.0 mbgs to 25.0 mbgs. Bedrock was generally shallower in the eastern portion of the ORWN site closest to Hickson Road and deeper in the western portion of the ORWN site closest to Darling Harbour.
- The reported contaminants of potential concern (CoPC) were generally consistent with those identified during previous reports encompassing the Site and surrounding gasworks, variably exceeding the adopted ORWN site investigation Criteria across the ORWN site.
- The maximum concentrations of CoPC were generally located in proximity to and down gradient from the former gasworks infrastructure in Blocks 4 and 5 outside the Declaration Area.
- A reported concentration of naphthalene above the soil vapour criterion was detected in the single soil vapour well located down-gradient of the former gasworks within the ORWN site, indicating the potential presence of gasworks-derived impacts. Concentrations of toluene (below soil vapour guidelines) were also detected.
- Groundwater was encountered at depths ranging from (1.823 to 2.975 m bgs) and was subject to tidal fluctuation.

The most significant groundwater contamination was reported in wells screened deeper within the aquifer, across the base of the fill and natural sediments immediately overlying bedrock. The identified contaminants were considered to be associated with the footprint of the former gasworks. Monitoring wells screened entirely within the top 10 m of the aquifer generally reported TPH, PAH and BTEX concentrations less than the laboratory Limit of Reporting (LOR). In order to make the ORWN site suitable for the proposed land use, the DGI also recommended:

- A site-specific HHERA addressing remediation of the ORWN site for the proposed future land use.
- A RAP detailing options for remediation and/or management and a recommended preferred strategy that would:
    - render the various areas of the ORWN site suitable for their intended land use;

- detail validation requirements to be implemented to demonstrate successful completion of the remedial works; and
- detail the requirement (if any) for potential future monitoring or management.

- A RWP providing a technical specification that is suitable for issue by Lend Lease to its contractors and that provides specific details of the work that must be completed to facilitate delivery of the remediation works prescribed by the RAP for the site.
- An Acid Sulfate Soil Management Plan for the management of PASS during future excavation works.

3.5 AECOM (2010d)

As part of the DGIs undertaken for the VMP Area, AECOM undertook a Groundwater Discharge Study (GDS).

The objectives of the GDS were to:

- provide more detailed data on the vertical distribution of contaminants and other parameters in the terrestrial groundwater environment;
- assess the degree of exchange (recharge and discharge) between Darling Harbour and the aquifer system due to tidal movements;
- assess the impact of this tidal exchange on the fate and transport of dissolved phase groundwater contaminants;
- attempt to quantify the amount of groundwater discharge and contaminant mass flux, from the site to Darling Harbour;
- attempt to quantify the degree of contaminant attenuation by seawater mixing prior to discharge; and
- provide an updated conceptual model for this portion of the site, to inform the ecological risk assessment process.

The conclusions of the GDS were as follows:

- Drilling at IT1 and IT2 confirmed that a thick sequence of fill material (up to 15 m) was present adjacent to the harbour in the west of the site. This was underlain by natural clayey marine sediments of variable thickness.
- A very efficient hydraulic connection exists between the harbour and the fill aquifer immediately adjacent, with head in this portion of the aquifer responding rapidly to changes in the tide; the caisson structure in this area is therefore highly permeable.
- Significant changes in water level in the unconfined fill aquifer (>1.0 m in some cases) suggested significant quantities of water are exchanged across the aquifer – harbour interface. The volume of water discharged to the harbour during a typical ebb tide was estimated at 25 ML (50 ML/day).
- By comparison to the fill aquifer, exchange occurring via the underlying marine sediments was almost negligible, with a discharge component estimated at 1.6 m^3/day, due to the low hydraulic conductivity and gradient. Groundwater discharge occurring via the basal Hawkesbury Sandstone is not considered significant in the context of site-derived contaminant flux to Darling Harbour.
- The proportion of groundwater to seawater (mixing model) discharging during the low tide cycle to Darling Harbour has been derived from a connate water displacement model. The estimated proportion of groundwater (which in this instance is connate water) is similar to studies elsewhere, suggesting that much of the water discharged during ebb tides comprises seawater which infiltrated during the previous flood tide. The mixing analysis indicates that the groundwater component of any discharge is likely to be 10-20% of the total, broadly consistent with similar studies conducted elsewhere.
- Contaminant mass flux is difficult to estimate on a site wide basis due to the heterogeneity of the fill, but mass flux is likely to be strongly limited by dilution occurring up-gradient of the tidal exchange prism. Where leachable source material is present within the tidal exchange prism, any resultant groundwater contamination is expected to discharge largely without further dilution.

- Based on a conservatively-derived five-fold dilution of dissolved phase contamination migrating from an up-gradient source zone into Darling Harbour, SSESC for groundwater and leachable concentration data at the Site could be reasonably approximated as the ANZECC (2000) trigger values multiplied by a factor of five.
- Based on the discharge study, contamination which has migrated into, or is otherwise present within the tidal exchange prism (estimated to be a zone at least six metres wide, on average, along the landside of the western caisson), is not expect to undergo further dilution prior to discharging to the harbour.

3.6 AECOM (2011)

AECOM undertook *In* situ Soil and Fill Validation for the ORWS Area, which involved the sampling and analysis of soil samples from 57 boreholes drilled across the ORWS Area on a 20 m grid.

The purpose of the *in situ* validation work were to:

- Confirm the classification and characteristics of soil and fill materials underlying the Site, including both material proposed to be excavated and that remaining *in situ* as part of the proposed development; and
- Facilitate identification of additional areas of contamination in order to confirm the requirements outlined in the RAP and expedite the proposed bulk earthworks program.

The objectives of the *in situ* validation works are to:

- Characterise the subject materials with a scope, extent and test frequency that will result in a robust data set (including both current and new data) sufficient to evaluate the suitability of the soil and fill materials from the Development Area to remain *in situ*; and
- Present the field and analytical data from the Site to inform the Amended RAP, which documents the remedial approach for the Site.

The investigation identified variably elevated concentrations of contamination variably exceeding the adopted Site assessment criteria in a number of locations within each of the sub-areas. The reported results were considered to be primarily associated with the historic importation of fill materials during reclamation work.

The remedial/management actions required as an outcome of the *in situ* validation works will be presented in the Amended ORWS RAP.

The data derived during the *in situ* validation works in conjunction with the previous data for the Site were considered suitable for the preparation of excavation plans which will provide guidance for the on-ground remedial and excavation works program. The excavation plans will be provided in the Remedial Works Plan (RWP) for the Site.

4.0 Site History and Regulatory Information

Site history and regulatory information were detailed in the AECOM EPA Declaration Area DGI (AECOM 2010b). A summary is provided in Table 3 below.

Table 3 Site History Summary

History and Regulatory Information	Summary
Site History of the Overall Site	Site history sourced from *Point History obtained from Land at Millers Point Ownership and Usage* (Broomham, 2007) and ERM (2007, 2008) reports; - AGL operated gas works between 1839 and 1918 - In the 1920s the gas works were demolished and Hickson road constructed through the former gas works - Other historic activities at Barangaroo in the early 1900s to 1950s included construction of finger wharves , construction of a sea wall, operation of commercial/industrial warehouses - In the 1950s and 1960s the area behind the sea wall (with the exception of the 'southern cove') was filled in with unclassified fill - Southern cove was reclaimed in 1988 - In the 1970s, 1980s and 1990s Barangaroo operated as a longshore port - In 1999 the overseas cruise ship passenger terminal (OPT) was constructed at the south end of Barangaroo - In 2007 Wharfs 5 and 7 and part of Hickson Road declared an investigation area by NSW EPA and in 2009 declared a remediation site - In 2010 the OPT was demolished
Gasworks Features	The estimated footprint of the former gasworks encompassed approximately 5,420 m^2 and comprised the following structures: - Retort House; - Meter House; - Gasholders; and - Purifier Beds.
Planning Information	On 9 February 2007 the Minister for Planning approved the Barangaroo Concept Plan. Following approval of the Concept Plan, on 12 October 2007 Schedule 3 of the State Environmental Planning Policy (Major Developments) 2005 was amended and the Site was rezoned to part RE1 Public Recreation and part B4 Mixed Use.
Record of EPA Notices	A record of EPA notices are detailed in the AECOM 2010 DGI (2010X).
NSW WorkCover	ERM (2007) included a search of NSW WorkCover Dangerous Goods Records, which indicated two licences for the greater Barangaroo site (35/032114 and 35/022097) by Patrick Stevedores Operations Pty Ltd and Union Bulkships Pty Ltd for the storage of above ground storage of Liquefied Petroleum Gas (LPG). ERM (2007) stated that a WorkCover representative indicated that this may not adequately reflect historic and bulk storage of dangerous goods, as WorkCover was not the only relevant dangerous goods authority for the site.

5.0 Site Condition and Surrounding Environment

5.1 Current Land Use

The location of the Site is presented on **Figure F1** and the Site layout is illustrated in **Figure F2 in** Appendix A.

The Site is currently variably paved with concrete and asphalt is used as public open space (foreshore walk), a fenced off development area and a public road (Hickson Road). The concrete ground surface was observed to be in generally good condition with some cracking noted on the surface of the asphalt. All permanent above ground structures have been demolished and only temporary site sheds, shipping containers, fences and other items relating to construction activities on the Site remain.

Access to the Site (excluding Hickson Road) is limited by the presence of a cyclone wire fence on the eastern side and temporary fencing around the remainder of the Site. Access to the Site is controlled by a 24 hour security presence with only authorised entry to the Site by workers and site visitors. During the field investigation undertaken as part of the DGI, a harbour walk was open to the public. The publicly accessible area is controlled by the presence of temporary fencing.

5.2 Surrounding Land Use

The Site is surrounded by the following land use:

- North: Barangaroo open space/concrete hardstand and Temporary Cruise Ship Terminal;
- South: The southern portion of Barangaroo followed by Sussex Street (public roads);
- East : Commercial and high density residential buildings with Jenkins Street beyond; and
- West: Darling Harbour.

5.3 Topography and Drainage

The topography of the Site is relatively flat having undergone significant historical cut and fill works. The Site abuts Darling Harbour at the western boundary. The entire Site is covered in hardstand (concrete and bitumen), with the exception of a number of trees running along either side of Hickson Road.

The majority of stormwater runoff would be captured by the various stormwater drains across the Site, which drain into Darling Harbour. Please refer to Section 2.8 of ERM (2008c) for more details.

5.4 Geology

Reference to the *1:100, 000 Geological Survey of NSW (Sydney) Sheet 9130 (Ed 1) (*Herbert 1983*)* indicates that the stratigraphy of the Site comprises man-made fill material, marine clays and Hawkesbury Sandstone.

Information from previous investigations indicates that the former 1880s shoreline ran approximately along the western edge of Hickson Road (i.e. along the eastern edge of the proposed Stage 1 Development). The area to the west of Hickson Road is understood to have been progressively reclaimed. Aerial photographs from the 1950s indicate that the area between Hickson Road and the current shoreline was occupied by a number of finger wharves, extending from Hickson Road. It is understood that the space between the historical finger wharfs and seawalls were in filled in several stages between the 1960s and 1980s with various types of material. The former Southern Cove is understood to have been filled in 1988.

The AECOM EPA Declaration Area and ORWN Area DGIs (AECOM, 2010b and 2010c, respectively) identified and summarised the following subsurface conditions across the Site which were generally consistent with previous investigations:

- The depth of fill materials encountered was variable across the Site, with fill depths ranging from 0.43 m bgs (AECOM BH67) to 17.5 m bgs (AECOM BH56);
- Fill materials were generally shallower in the eastern portion of the Site closest to Hickson Road and deeper in the western portion of the Site;
- The thickness of fill material generally increased from east to west across the Site;

- Observations during test pitting and drilling works identified unconsolidated, highly variable fill materials, which generally comprised unconsolidated gravels, sand, bricks, sandstone, timber, slag and steel;
- Visual signs of contamination including black staining, tar and surface sheen (where groundwater was present) were noted in several test pits, predominantly located in the footprint of the former Retort House and Purifying Beds within Block 4 in a variable gravelly sand to clayey sand matrix;
- Natural soils encountered across the Site comprised silty sands, gravelly sands, clays, weathered sandstone and sand with components of clay;
- Bedrock encountered across the Site was sandstone in every instance;
- The depth to bedrock encountered during the DGI was variable across the Site, with depths to sandstone ranging from 0.43 m bgs (AECOM BH67) to 25.0 m bgs (AECOM BH60/MW60);
- Bedrock was generally shallower in the eastern portion of the Site closest to Hickson Road and deeper in the western portion of the Site;
- The depth to sandstone bedrock generally increased from east to west across the Site.

5.5 Hydrogeology

Hydrological conditions were investigated and reported in the AECOM EPA Declaration Area and ORWN Area DGIs (AECOM, 2010b and 2010c). The findings are summarised below:

- NSW Department of Natural Resources (DNR) groundwater bore data as reported in ERM (2007) indicated that there were 32 registered groundwater bores within a 4 km radius of the Site. Groundwater bore information indicated that the bores were registered for either recreation, irrigation or monitoring purposes.
- Groundwater was encountered within fill, natural soil and bedrock at the Site. Groundwater levels were relatively shallow (less than 3 m) which was expected given the Site's location adjacent Darling Harbour and results from the previous investigations.
- Free tar was observed as a dense non-aqueous phase liquid (DNAPL) in wells ERM MW204D, ERM MW205, ERM MW206, AECOM MW53, Coffey MW15, Coffey BH7 and Coffey BH10, as well as test pits TP05 and TP07.
- An assessment of hydraulic conductivity at the Site reported the following:
    - The calculated hydraulic conductivities were variable across the Site and ranged from 1.7×10^{-5} to 3.4×10^{-8} m/sec and averaged 4.71×10^{-6} m/sec and were consistent with literature values for a sandy, silty environment.
    - Hydraulic conductivities were highest in units containing gravels and sands and were lower in units which displayed an increased level of compaction and/or clay content.
    - Groundwater flow paths and subsequent migration of groundwater contamination are likely to be complicated by the spatial variability in conductivities across the Site as well as subsurface structures such as the existing caissons.
- A tidal assessment of the Site indicated the following:
    - The Site was tidally influenced, with the influence extending as far inland as Hickson Road.
    - This was supported by the presence of highly saline water within wells across the Site.
    - The amplitude of tidal induced groundwater fluctuations reduced with distance from Darling Harbour and the inconsistent nature of backfill materials appeared to influence flow directions and velocity of groundwater movement at the Site.

5.6 Potentially Sensitive Receptors

The closest potential aquatic sensitive receptor is Darling Harbour and the adjacent Sydney Harbour which are highly urbanised estuaries. Sydney Harbour is used for a mixture of purposes including recreational purposes such as boating, swimming and fishing and for commercial purposes including cargo and passenger transport. The area of Darling Harbour adjacent to the Site currently serves as a passenger terminal for cruise vessels.

The Site is situated in a mixed commercial and residential area. No other environmentally sensitive receptors have been identified.

Potential human exposure to contaminants of potential concern (CoPC) in impacted soil/fill materials and/or groundwater may occur via the following potential exposure pathways:

- Direct dermal contact with impacted materials;
- Incidental ingestion of impacted materials;
- Inhalation of volatile potential contaminants of concern; and
- Inhalation of potential contaminants of concern sorbed to air-borne particulates.

The following potential human receptors were identified:

- Workers engaged in Site operational activities;
- Workers engaged in future redevelopment of the Site;
- Workers on the Site entering confined spaces or exposed to subsurface materials during maintenance work;
- Future residents inhabiting the Site;
- Off-site workers conducting construction, road or other sub-surface works in the vicinity of the Site;
- Residents in neighbouring properties and;
- Occupants within the day care facility located on Hickson Road.

6.0 Potentially Contaminating Activities and Contaminants of Concern

Based on the historical review of the Site as presented in the ERM (2007, 2008a) reports and the results of the environmental and geotechnical investigations conducted on the Site, the potentially contaminating activities and associated CoPC have been identified and are summarised in the table below.

Table 4: Potential Potentially Contaminating Activities and CoPC

Description of Potentially Contaminating Activity	CoPC	Comments
Former gasworks	Metals, TPH, BTEX, PAHs, phenols, sulfate, cyanide, ammonia	Associated with gasworks waste. Gasworks contamination is likely to be concentrated in the vicinity gasworks infrastructure across the Declaration Area but may have also been relocated.
Importation of fill materials for reclamation activities	Metals, TPH, BTEX, PAHs, PCBs, OCPs, VOCs, SVOCs, Asbestos	Fill materials of unknown origin have been used for land reclamation the existing wharf areas.
Demolition of former buildings potentially containing hazardous materials	Lead, PCBs, Asbestos	Hazardous materials, including asbestos cement sheeting and lead based paints, may have been used in the construction of historical warehouses, buildings and/or industrial infrastructure on the Site and may have been introduced to the sub-surface during demolition works or as a result of leaching or weathering while the building structures were still in place.
Reclamation activities	ASS	Given the proximity of the Site to Darling Harbour the potential for ASS is present. Potential ASS (PASS) are likely to be present in the natural silts, sands and clays overlying the bedrock at depth on the Site.

Notes:

Metals – Arsenic (As), Copper (Cu), Chromium (Cr), Cadmium (Cd), Mercury (Hg), Lead (Pb), Nickel (Ni), Zinc (Zn)
PAHs – Polycyclic aromatic hydrocarbons
TPH – Total petroleum hydrocarbons
BTEX – Benzene, toluene, ethylbenzene and xylenes
OCPs – Organochlorine pesticides
OPPs – Organophosphorus pesticides
PCBs – Polychlorinated biphenyls
SVOCs – Semi volatile organic compounds
VOCs – Volatile organic compounds
ASS – Acid Sulfate Soils

7.0 Field Investigation Methodology

Field investigations were undertaken in accordance with the methodologies described below.

7.1 Soil Investigation

7.1.1 Services Location and Clearance

All borehole locations (BH400 to BH413) were cleared for subsurface utilities as follows:

- Plans of underground utilities were requested from the Dial-Before-You-Dig service and relevant utility representatives were contacted to confirm proposed sample points were clear of subsurface utilities. CAD plans relating to the presence of subsurface utilities were also supplied by BDA and Lend Lease. All plans were reviewed by AECOM prior to the commencement of service location clearance. Any borehole locations potentially located in the vicinity of identified underground services were changed at this time;
- All sampling points were located in consultation with on-site personnel and previously obtained subsurface utility maps. All sample locations were suitably marked on the ground with spray paint and photographs taken of the cleared locations;
- Each sampling location was cleared using a Telstra accredited, underground services location contractor (Locators); and
- Each location was potholed by air-knifing (non-destructive drilling) by a competent subcontractor (Terra Test) to at least 1 m bgs or to refusal.

7.1.2 Intrusive Work

Terratest were engaged to carry out the drilling operations. The drilling techniques consisted of a combination of solid stem augers and rotary casing advance techniques. Soil from boreholes was collected using a split tube sampler. Boreholes were drilled to bedrock at all locations.

Borehole locations that were not converted to groundwater monitoring wells were reinstated with grout or soil cuttings that had been drilled out from that location.

7.1.3 Soil Sampling

All boreholes were air-knifed to at least a depth of one metre (where possible) to expose underground services. Soil samples were then collected from 0.5 m bgs, then 1 m bgs and then at 1 m intervals or change in lithology or fill type. Where possible, soil samples were collected from the natural material, at the interface with any overlying fill and underlying bedrock.

Sub-surface soil samples were collected directly from the relatively undisturbed inner core of split spoon sampling device.

All soil samples were placed in laboratory prepared glass sampling containers using single use disposable nitrile gloves. Field duplicates (intra laboratory) and triplicates (inter laboratory) were prepared in the field by splitting soil samples. In order to minimise the loss of volatiles, samples were not mixed or homogenised during collection or splitting and jars were filled so as to minimise the amount of headspace where sample recovery allowed.

Sub samples were collected of fill samples in separate plastic zip lock bags for laboratory analysis for asbestos.

7.1.4 Soil Sample Labelling, Preservation, Storage and Transport

All samples were clearly labelled with unique sample identification numbers consisting of the date, sample location, depth of sample and samplers initials. In the case of field duplicates and triplicates, sample containers were labelled so as to not reveal their purpose or sample location to the laboratory. All samples were kept chilled in an ice-filled esky prior to dispatch to the NATA registered laboratory under chain of custody (COC) procedures.

All samples collected are stored at the laboratory (3 months for metals [28 days for mercury], or 14 days for organics).

7.1.5 Soil Sampling Equipment Decontamination

The decontamination procedures were performed before initial use of re-useable equipment and after each subsequent use.

The augers used in drilling were decontaminated using a pressurised water cleaner between each borehole location. All re-usable sampling equipment (split tube sampler and spatula) were decontaminated between each sample by scrubbing with a solution of Decon 90 (a phosphate-free detergent) followed by a rinse in potable water. For each day of sampling, following decontamination procedures, a rinsate blank was completed by running laboratory prepared deionised water over the re-usable sampling equipment for collection directly into laboratory prepared sampling containers for analysis.

At each sample location a new set of disposable nitrile gloves were used to directly collect soil samples from the re-useable sampling equipment for placement into the laboratory prepared glass sampling containers.

7.1.6 Field Screening

For each sample depth, additional soil was placed in a sealed plastic bag and screened for head space vapours and the presence of VOCs, using a calibrated photo-ionisation detector (PID). The headspace reading was taken at ambient temperature and was recorded on the borehole logs (Appendix D). The PID readings were considered when selecting soil samples for laboratory analysis.

The PID was calibrated with isobutylene gas at 100 ppm at the commencement of each day of sampling and, if necessary, during the day in accordance with the procedure provided by the supplier. Calibration records are provided in Appendix E.

7.1.7 Field Logging

Recording of logs for boreholes and in the field was conducted in accordance with AS1726-1993 and soils were classified in accordance with the Unified Soil Classification System (USCS), including observation of any anthropogenic material (i.e. odours, asbestos cement [AC] sheeting etc). Descriptions were recorded on AECOM's standard borehole and monitoring bore field log sheets for uniformity in descriptions, presentation and to aid in future interpretations.

The American Society for Testing and Materials (ASTM) system and the USCS are the general standards used by AECOM in classifying soil by visual and manual examination. The reference for the USCS system is *Procedure for Determining Unified Soil Classification (Visual Method)*, United States Department of the Interior, Bureau of Reclamation (USBR) 5005-86. The reference for the ASTM system is *Description and Identification of Soils (Visual-Manual Procedure)*, ASTM Standard Practice D 2488-90.

7.1.8 Survey of Boreholes

The borehole location and ground level were surveyed by a registered surveyor from Rygate & Company Pty Ltd (Rygate) with reference to the Australian Height Datum (AHD) and Australia Map Grid (AMG).

The elevation and position of the boreholes are recorded on the borelogs provided in Appendix D.

7.2 Groundwater Investigation

7.2.1 Monitoring Well Installation

One standard monitoring well (MW401) was installed and five bundled piezometers (IT03 to IT07) were installed.

Groundwater monitoring well MW401 was constructed using machine slotted (0.5mm aperture), 50mm uPVC screen, placed from across the natural lithology to bedrock. A 0.5 m sump was placed at the bottom of the well in bedrock to enable detection of DNAPL, if present.

Bundled piezometer's IT03 to IT07 were constructed of three 25 mm diameter piezometers with 1 to 2 m screens installed within the borehole at the following intervals:

- Immediately below the water table;
- Immediately above the base of the fill; and
- Within the underlying natural sediments (sealed from overlying fill materials).

Prior to installation, the total depth of the borehole was measured with a weighted tape. The monitoring well casing was lowered in the borehole and suspended. Graded filter sand (2mm diameter) was added to the annulus between the uPVC casing and the wall of borehole to approximately 0.5 metres above the top of the screened interval. A minimum of 0.5 m hydrated bentonite seal was added above the filter sand. All wells were finished with a lockable metal cap and concrete encased steel cover that was traffic rated and flush to grade.

7.2.2 Monitoring Well Development

Newly constructed groundwater monitoring wells were developed using both dedicated Teflon foot valves (for IT03 to IT07) and low density polyethylene (LDPE) polytube and an electronic high volume submersible pump (for MW401) to entail the removal of accumulated sediment and groundwater from the monitoring well. Development proceeded until at least ten monitoring well volumes were removed. The pumping process creates a surging action that promotes groundwater inflow to the monitoring well and maximising connectivity with the surrounding aquifer, as well as removing accumulated sediment.

7.2.3 Groundwater Purging and Sampling

After allowing the wells to equilibrate for a general period of seven days, water levels were measured using an oil/water interface probe and the standing thickness of any NAPLs were measured and recorded. The groundwater monitoring wells were then purged using low flow methods using a Micropurge submersible pump (for all monitoring wells except IT03 and MW69) and dedicated Teflon footvalves (for IT03 and MW69 – as submersible pump could not fit in these wells) and LDPE polytube.

For low-flow sampling the submersible pump was generally positioned approximately 0.5 m from the base of the screened interval (or well where sediment had accumulated). If the pump screen became blocked due to sediment in the water column the pump was positioned further up the screen and recorded on field sampling sheets.

The water level was monitored during purging to ensure there was no significant draw-down of the water table and water quality parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], electrical conductivity [EC], temperature and pH) were monitored and recorded along with purge rate and volume during low flow sampling. The flow rate was reduced if drawdown was observed until water level stabilised.

Purging of the monitoring wells continued until water quality parameters become relatively consistent between successive readings (generally 3 consecutive readings of ±10% for DO, ±3% for EC, ±0.05 for pH, ±10mV ORP and ±0.2ºC), generally after purging between 3 and 6 litres. At the completion of purging, the water level was recorded with an oil/water interface probe. Purged water has been stored in drums for disposal. Following stabilisation of water quality parameters, groundwater was sampled from each monitoring well.

Where low flow sampling was not possible (intertidal wells and MW69), footvalves and dedicated LDPE tubing were used to purge three well volumes or until water quality parameters had stabilised before collecting groundwater samples.

Groundwater samples were carefully decanted into laboratory supplied, appropriately preserved containers as per the preferred analytical method. Sample containers were filled in the order of most volatile to least volatile. Samples collected for metals analysis were field filtered using a 0.45um filter prior to collection into the sampling container. Field duplicates and triplicates were also prepared in the field.

7.2.4 Survey of Monitoring Wells

The location, top of each monitoring well casing and adjacent ground level were also surveyed by Rygate, with reference to the Australian Height Datum (AHD) and Australia Map Grid (AMG) to allow reliable calculation of groundwater levels including tidal fluctuations.

The elevation and position of the monitoring wells are recorded on the borelogs provided in Appendix D.

7.3 Laboratory Methodology

7.4 Standard Analysis

Primary, intra-laboratory duplicate, triplicate, rinsate and trip blank soil and groundwater samples were submitted to either ALS Environmental laboratory located in Smithfield NSW or Labmark laboratory located in Asquith NSW for analysis. The selected laboratories are National Association of Testing Authorities (NATA) certified for the analysis required.

The selection of samples for analysis was based on field observations and was generally conducted in accordance with the analytical program presented in the SAQP (AECOM, 2010a).

Laboratory analysis was conducted in accordance with the requirements of NEPM and is referenced to USEPA and APHA methods. The analytical schedule, laboratory methods, laboratory limits of reporting (LORs) and reference methods to be applied for the investigation are detailed below in Table 5 and Table 6.

Table 5: Soil Analytical Methods

Analysis	Labmark Limit of Reporting	Labmark Reference method	ALS Limit of Reporting	ALS Reference method
Metals suite comprising arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), nickel (Ni), lead (Pb), and zinc (Zn).	0.1 - 5.0 mg/kg	Acid Digestion/ICPAES (Alpha 20th 3120-(USEPA SW846, 6010)	1 - 5 mg/kg, Ba 10 mg/kg	Acid Digestion/ICPAES (Alpha 20th 3120-(USEPA SW846, 6010)
Mercury (Hg)	0.1 mg/kg	Acid Digestion/CV-FIMS (Alpha 20th 3120-USEPA SW846, 6010)	0.1 mg/kg	Acid Digestion/CV-FIMS (Alpha 20th 3120-USEPA SW846, 6010)
PAHs	0.5-1.0 mg/kg	Mechanical Agitation/GCMS (USEPA 8270)	0.5 mg/kg	Mechanical Agitation/GCMS (USEPA 8270)
TPH C_6-C_9	0.2 – 10 mg/kg	PT-GC/FID (USEPA 5030/3510/8015)	2 mg/kg	P&T/GC/MS (USEPA 5030/8260)
TPH C_{10}-C_{36}	50 – 100 mg/kg	GC/FID (USEPA 3510/8015)	50 -100 mg/kg	GC/FID (USEPA 3510/8015)
BTEX	0.2-1 mg/kg	Methanol Extraction/P&T/GC/MS (USEPA5030/8260) (USEPA8015)	0.2 – 0.4 mg/kg	GC/MS (USEPA 5030/8260)
Asbestos*	NA	NA	ND/D	PLM & Disp Staining
TCLP – metals, mercury and SVOCs	NA	NA	Metals - 0.1-5 µg/L	Tumbling (USEPA 1311) ICP-AES (metals) GC/MS (PAH's).
ASLP - Metals	NA	NA		ICPAES (USEPA SW 846 – 6010) Mercury - 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS
ASLP - SVOCs	NA	NA		USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode

Table 6: Groundwater Analytical Methods

Analysis	Labmark Limit of Reporting	Labmark reference method	ALS Limit of Reporting	ALS Reference method
Metals suite comprising arsenic (As), aluminium, antimony (Sb), (Al),barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu),manganese (Mn), nickel (Ni), lead (Pb), selenium (Se), silver (Ag), vanadium (V) and zinc (Zn)	0.1-5 µg/L	ICPMS (USEPA 6020)	Cd – 0.0001 mg/L Zn – 0.005 mg/L Others 0.001 mg/L	ICPMS (USEPA 6020)
Hg	0.01µg/L	CV-FIMS (APHA 3112)	0.0001 mg/L	CV-FIMS (APHA 3112)
TPH C_6-C_9	1 – 50 µg/L	PT-GC/FID (USEPA 5030/5035/8260)	20 µg/L	P&T/GC/MS (USEPA 5030/8260)
TPH C_{10}-C_{36}	50 – 200 µg/L	GC/FID USEPA 3510/8015)	50 – 100 µg/L	GC/FID (USEPA 3510/8015)
BTEX	1 – 2 µg/L	P-T/GCMS (USEPA 5030/8260)	1 – 4 µg/L	P&T/GCMS (USEPA5030/8260)
PAHs	0.01 - 0.02 µg/L (TL)	GC/MS (USEPA 3510/8270)	0.05 – 0.1 µg/L (UT)	GPC-GC/MS-SIM (USEPA 3640/8270)
Free and WAD cyanide	0.005 – 0.01 mg/L	Diffusion cell/Colourimetric	1 mg/kg	APHA 4500-CNC& N

List of abbreviations to Table 6 and 7:
Lend Lease = Low Level
TL = Trace Level
UT = Ultra Trace
CV-FIMS = Cold Vapour-Flow Injection Mercury System
EC = Electron Capture
ECD = Electron Capture Detector
FID = Flame Ionisation Detector
GC = Gas Chromatography
GCFID = Gas Chromatography Flame Ionisation Detector
GCMS = Gas Chromatography Mass Spectrometry
ICP-AES = Inductively Coupled Plasma Atomic Emission Spectrometry
ICP-MS = Inductively Coupled Plasma Mass Spectrometry
MS = Mass Spectrometry
PLM = Polarised light microscopy
P&T or P-T = Purge and trap

7.5 Additional Analysis – Filtrate and Filter Cake Analysis

To provide additional data required for the HHERA's during the course of the Supplementary VMP DGI, groundwater samples were analysed as filtrate and the residue collected on filter paper (filter cake) was then analysed to determine whether the dominant contaminant transport matrix is groundwater (i.e. dissolved) or the solid material (sorbed to soil particles). The laboratory used the following procedure for producing and analysing filtrate and filter paper:

- Unpreserved sample from the glass amber bottles (SVOC and VOC analysis) or plastic bottle (inorganics analysis) were filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter';
- The first filter paper was analysed and labelled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper
- The second filter paper was then analysed and was labelled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample.
- Before filtering any samples, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.

The filter paper analytical methodologies were as per standard soil analytical methodologies summarised in Table 5. The filtrate was analysed using standard laboratory analytical methodologies summarised in Table 6 above.

8.0 Quality Assurance and Quality Control

The field and laboratory quality assurance and quality control (QA/QC) plan adopted for the investigation has been designed to achieve pre-determined data quality objectives (DQOs) that will be assessed using the data quality indicators (DQIs) that demonstrate the precision, accuracy, representativeness, completeness and comparability of the data set and that the data set is of acceptable quality to meet the objectives of the DGI.

8.1 QA/QC Data Validation

The QA/QC program implemented as part of this DGI was generated as the outcome of the seven-step DQO process, as described in the SAQP (AECOM, 2010a) and summarised in Appendix C.

Analyses of primary and intra-laboratory duplicate soil and groundwater samples were undertaken by Australian Laboratory Services Environmental (ALS). Triplicate samples were analysed by Labmark Laboratories. SGS undertook the analysis of soil vapour samples and Australian Soil Testing analysed samples collected for geotechnical purposes. All laboratories are NATA accredited for the analyses undertaken.

Details of the QA/QC data validation are presented in Appendix F. It is noted that as the fieldwork (including laboratory sample analysis) for both this DGI and the Other Remediation Works North Area DGI were completed and reported concurrently. As such, the reported QA/QC data validation presents an incorporated review of data from both investigations.

8.2 Data Useability

The data validation procedure employed for the assessment of the AECOM field and laboratory QA/QC data indicated that the reported analytical results are representative of soil conditions at the sample locations, and that the overall quality of the analytical data produced is acceptably reliable for the purpose of the Supplementary DGI.

9.0 Basis for Assessment Criteria

As with the previous DGI's undertaken for the Site by AECOM, generic assessment criteria for the soil and groundwater investigation have been adopted from the following guidance documents:

- NSW DEC, 2007. Guidelines for the Assessment and Management of Groundwater Contamination;
- NSW DEC, 2006. Guidelines for the NSW Site Auditor Scheme (2nd Edition);
- enHealth Council, 2005. Management of asbestos in the non-occupational environment;
- Australian and New Zealand Environment and Conservation Council and Agriculture and Resourced Management Council of Australia and New Zealand. (ANZECC), 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality;*
- National Environment Protection Council (NEPC), 1999. National Environment Protection (Assessment of Site Contamination) Measure (NEPM); and
- NSW EPA, 1994. Guidelines for Assessing Service Station Sites.

It is noted that human health based Site-specific target criteria (SSTC) and Site-specific ecological screening criteria (SSESC) are being developed for each of the Barangaroo areas by the various HHERA's and the data will be compared against the historical and the additional data from this investigation in the various RAP's for the Site.

9.1 Soil Investigation Criteria

Given the proposed soil analytical program for the Site and the proposed range of uses for the Site, a range of investigation criteria sourced from the guidance documents listed above were applied. Application of these guidelines to the soil samples collected and analysed from the Site is described below.

9.1.1 Metals, Cyanide, PAHs and Phenol

The current investigation criteria used in NSW to evaluate soil analytical results for metals, cyanide, PAHs, OCPs, OPPs, phenol and PCBs are provided in NSW DEC (2006) guidelines which are based on guidance provided in NEPC (1999). These guidelines present a range of Health-Based Soil Investigation Levels (SILs) and Provisional Phytotoxicity-based Investigation Levels (PILs) for soils, which are considered to be appropriate for a range of land uses on urban sites in NSW, as follows:

- SIL_1 Residential with gardens and accessible soil.
- SIL_2 Residential with minimal access to soil (including high-rise apartments/flats).
- SIL_3 Parks, recreational open space, playing fields (including secondary schools).
- SIL_4 Commercial or industrial.

The SIL_2, SIL_3 and SIL_4 criteria have been variably adopted for the purposes of the DGI as follows:

- Blocks 4 and 5 and VMP area: SIL_2 and SIL_4
- Public Domain and Proposed Southern Cove: SIL_2 and SIL_3

It is noted that the PILs assume application to sandy loams with a pH 6 to 8 and the soils on the Site are generally characterised as fill clays and clayey sands to sandy clays. The application of the PILs has significant limitations as phytotoxicity depends on soil and species parameters in ways that are not fully understood. Therefore PILs will not be considered further.

9.1.2 TPH and BTEX

The NSW EPA (1994) *Guidelines for Assessing Service Station Sites* provides investigation criteria to evaluate soil analytical results for TPH and BTEX compounds. These criteria have been developed for sensitive land use scenarios and are the only currently NSW EPA endorsed criteria when considering the environmental impacts from these types of compounds.

The criteria provided in the NSW EPA (1994) guidelines are adopted as the site investigation criteria for TPH and BTEX in soils and are applicable across the entire Site.

9.1.3 Asbestos

There are currently no national or NSW EPA endorsed guidelines relating to human health or environmental investigation of material containing asbestos on sites. The NSW DEC (2006) guidelines require that auditors exercise their "*professional judgement when assessing whether a site is suitable for a specific use in light of evidence that asbestos may be a contaminant of concern*".

The enHealth Council (2005) guidelines provide some guidance on the assessment and management of asbestos in soil and recommend that, where fragments of asbestos cement are found, that the type of asbestos present should be confirmed by microscopy and that the whole area where fragments are located should be regarded as contaminated and action taken. The enHealth Council (2005) guidelines also state that, depending on where fragments are located and the proportion of fragments present, it may not be necessary to measure the actual concentration present, however, in New Zealand and Western Australia an average of 0.001 percent by weight asbestos in soil has been applied.

The approach of determining the weight of asbestos fibres within asbestos cement fragments over the affected soil by applying an average of 0.001 percent by weight calculation is considered to be a very conservative measure and may not be applicable for this stage of investigation on the Site. For the purposes of this investigation it is important to determine the presence, nature and extent of asbestos. If asbestos is found to be present, a management approach for the affected soils can be developed.

9.2 Aesthetic Conditions

In the decision-making process for assessing urban sites, presented in NSW DEC (2006), the assessment of sites that are to be used for purposes other than commercial/industrial requires the consideration of aesthetic issues in the assessment of contamination. Aesthetic issues include the generation of odours and any discolouration of the soil as a result of contamination.

In accordance with NSW DEC (2006) guidelines, consideration will be given to aesthetic issues such as odour and discolouration during the investigation of soil/fill across the Site.

9.3 Groundwater Investigation Criteria

The ANZECC (2000) guidelines have been adopted for this investigation. ANZECC (2000) provides "Trigger Values" for chemicals within water, which represent the best current estimates of the concentrations of chemicals that should have no significant adverse effects on the aquatic ecosystem. The ANZECC (2000) guidelines indicate that an exceedence of a Trigger Value does not necessarily imply that there is an inherent risk, but that further assessment and monitoring may be required prior to implementing appropriate management actions. It is noted that according to ANZECC (2000), low reliability Trigger Values are Interim Levels only because "*low reliability guideline trigger values were derived, in the absence of a data set of sufficient quantity, using larger assessment factors to account for greater uncertainty*", and "*low reliability values should not be used as default guidelines*". ANZECC (2000) stipulates that the identification of the receiving environment or the likely beneficial use of the water is essential for selection of the most applicable criteria.

The closest aquatic ecological receptor/receiving environment is Darling Harbour located to the west of the Site, beyond the ORWN area. Darling Harbour and the adjacent Sydney Harbour are highly urbanised estuaries. Sydney Harbour is used for a mixture of purposes including recreational purposes such as boating, swimming and fishing and for commercial purposes including cargo and passenger transport. The area of Darling Harbour adjacent to the Site currently serves as a passenger terminal for cruise vessels. As Darling Harbours current status according to ANZECC (2000) is a 'slightly to moderately disturbed' marine environment, groundwater results from this investigation are compared to the following:

- ANZECC (2000) 95% species protection marine trigger values; and
- ANZECC (2000) 99% species protection marine trigger values for potentially bioaccumulative contaminants.

There are no current NSW EPA endorsed high reliability assessment criteria for TPH in groundwater, although an arbitrary aesthetic criterion of 10 000 μg/L (10 mg/L) is provided in NSW EPA (1994). The ANZECC (2000) guidelines provide an interim low reliability value for crude oil of 7 μg/L (0.007 mg/L), which is known to contain hundreds of hydrocarbon species, many of which are not present in refined petroleum hydrocarbon fuels. In addition, this criterion is not considered to be appropriate as current commercial laboratory techniques cannot quantify TPH to this concentration and it has been derived on a worst case pollution scenario such as a constant

discharge to the environment at a rate that exceeds the losses from evaporation or dispersion (Tsvetnenko, 1998). In the absence of high reliability TPH trigger value, AECOM has adopted the laboratory limits of reporting (LOR) as the 'default' screening criteria for TPH.

10.0 Results

Descriptions of the fill and natural soil materials encountered during the drilling program are described in the following sections, and are also described in the borelogs provided in Appendix D.

10.1 Field Observations – Soil and Fill Conditions

Encountered stratigraphic conditions were consistent with previous investigations at the Site with variable stratigraphic conditions encountered across the Site, but generally comprised fill material overlying natural marine sediments and weathered sandstone with clay components.

A summary of each borehole location drilled in this investigation is summarised in Table 7 below.

Table 7 Field Soil and Fill Observations

Borehole (depth m bgs)	Fill	Natural	PID Readings (ppm)
BH400 (16.4)	- Encountered to a depth of 12.4 m bgs - Consisted of gravelly sand with inclusions of sandstone, bitumen, brick, concrete and basalt. - A mild tar odour between 6 and 9.5 m bgs.	- High plasticity organic silty clays underlying the fill, followed by sandy clay and clayey sand. - Bedrock sandstone was encountered at 16.8 m bgs. - Tar odour between 14 and 16.8 m bgs with black staining at 16 -16.4 m bgs	0.2 to 526
BH401 (20.15 m)	- Encountered to a depth of 14 m bgs - Consisted of gravelly sand with inclusions of sandstone, bitumen, brick, concrete, basalt, timber and glass. - A mild tar between 10 and 14 m bgs	- High plasticity organic silty clays underlying the fill, followed by sandy clay and clayey sand. - Bedrock sandstone was encountered at 20.15 m bgs. - Tar odour was observed between 17 and 20.15 m bgs - Black tar veins from 19.2 to 20 m bgs	0.2 to112.4
BH402 (19.8 m)	- Encountered to a depth of 14 m bgs - Consisted of gravelly sand and silty sand with inclusions of sandstone, bitumen, brick, concrete, basalt, timber, glass, shale and minor copper metal and plastic. - A tar odour at 4, 9 and 13 m bgs	- Silty sandy clay underlying the fill followed by clayey silty sand, silty clay - Sandstone bedrock at 19.8 m bgs - Strong hydrocarbon odour, black staining and sheen noted between 14 and 19.8 m bgs	0 to 2297
BH403 (17.3)	- Encountered to a depth of 8 m bgs - Consisted of gravelly sand with inclusions of sandstone, brick, basalt, shells, glass and timber - Tar odour between 3 and 8 mbgs	- High plasticity organic silty clays underlying the fill, followed by sandy clay and clayey sand - Sandstone bedrock at 17.3 m bgs - Strong hydrocarbon odour from 9 to 17.3 m bgs	0 to1239
BH404 (16)	- Encountered to a depth of 16 m bgs - Consisted of gravelly sand and gravel with sandstone, brick, basalt, concrete, slag - Tar odour at 0.4 and 7.0 m bgs - Hydrogen sulphide odour at 12.0 to 12.4 mbgs	- Silty clay with residual sandstone encountered at 15.0 m bgs - Sandstone bedrock at 16.0 m bgs - Hydrocarbon and black staining between 15 and 16 m bgs	0.5 to 20.1

Borehole (depth m bgs)	Fill	Natural	PID Readings (ppm)
BH405 (14.45)	- Encountered to a depth of 13 m bgs - Consisted of silty sand and gravel with inclusions of sandstone, clay, timber, brick and shale. - No odours observed	- Sand underlying fill followed by silty sandy clay - Sandstone was encountered at 14.45 m bgs - Tar odour from 13 to 14.45 m bgs - Black staining at 14 m bgs	0.5 to 467.2
BH406 (16.8)	- Encountered to a depth of 15 m bgs - Consisted of variable layers of silt, sand, gravel and clay with inclusions of concrete, brick, timber , road base gravels and small plant roots - Hydrogen sulphide odour at 4 m bgs - Hydrocarbon odour at base of fill	- Silty clay underlying the fill followed by silty sand - Sandstone bedrock at 16.8 m bgs - Tar odour and black staining throughout	0.6 to 3010
BH407 (18.6)	- Encountered to a depth of 13 m bgs - Consisted of silty sand and gravelly sand with inclusions of sandstone, road base gravels and shale - No odour or staining observed	- Silty clay underlying fill followed by very dense sand - Sandstone bedrock encountered at 18.6 m bgs - Tar odour throughout	0.3 to 238.8
BH408 (9.7)	- Encountered to 8 m bgs - Consisted of sandy gravel and gravelly sand with inclusions of sandstone and shale - No odour or staining observed	- Silty sandy clay underlying fill - Sandstone bedrock encountered at 9.7 m bgs - Tar odour and black staining throughout	0.2 to 549.7
BH409 (7.9)	- Encountered to 4.2 m bgs - Consisted of gravelly sand/silty clay/silty sand with inclusions of sandstone, brick, concrete and minor road base - No odour or staining observed	- Sand with shells underlying fill followed by silty sandy clay - Sandstone bedrock encountered at 7.9 m bgs - Hydrocarbon odour with no staining throughout	0.7 to 228.5
BH410 (32.2)	- Encountered to 17 m bgs - Consisted of gravelly sand and gravel with inclusions of sandstone, brick and minor white plastic and copper - Possible voids in fill - No odour or staining observed	- Silty clay underlying fill followed by sandy clay and silty clay layers - Loose sand layer between 21 and 24 m bgs followed by silty clay and sandy clay layers - Hydrocarbon odour and black staining at top of natural - Bedrock encountered at 32.2 m bgs	0 to 0.7
BH411	- Encountered to 18.0 m bgs - Consisted of sandy gravel and silty sand with inclusions of brick, terracotta, sandstone and basalt - No odour or staining observed	- Silty clay underlying fill followed by layers of sandy clay and clayey sand - Terminated at 27 m bgs in very dense clayey sand - No odour or staining observed	0.3 to 4.3
BH412	- Encountered to 18.0 m bgs - Silty Clay and gravel with inclusions of sandstone, brick, siltstone, basalt - Hydrocarbon odour between 3 and 6 m bgs	- Silty clay underlying fill followed by silty clay and sandy clay with a sand layer between 21 and 22 m bgs with minor black staining - Sandstone bedrock at 23.5 m bgs - No hydrocarbon odour observed	0 to 1.3

Borehole (depth m bgs)	Fill	Natural	PID Readings (ppm)
BH413	- Sandy gravel and gravel with inclusions of sandstone, concrete, road base gravels, granite - Hydrocarbon odours observed between 1 and 15 m bgs	- Silty clay with organic matter underlying fill - Sandstone bedrock encountered at 17.7 m bgs - Slight hydrocarbon odour throughout	0 to 1.1

10.2 Soil Analytical Results

A summary of the AECOM sampling and analytical programme, including sample depths, material type and PID readings, is provided in Table T1a in Appendix B.

Soil analytical results are provided **Table T3** and **Table T4** in Appendix B and in laboratory reports in Appendix H**.**

A tabulated summary of results from the VMP area, Blocks 4 and 5 and the RBZ area are provided in the below sections.

It is noted that only analytes which have reported concentrations above the adopted Soil Investigation Criteria have been summarised below.

Additional TCLP and ASLP analysis undertaken on samples collected from BH400 to BH413 for inclusion in the HERRA's are presented in Table T7 in Appendix B and are provided in laboratory certificates in Appendix H. These results are discussed in the HERRA and not further discussed in this report.

10.2.1 VMP Area and RBZ

Results with exceedences of the adopted Soil Investigation Criteria for the VMP area and the RBZ (BH400 to BH409 [excluding BH407]) are summarised in Table 9 below.

Table 8: VMP Area and RBZ Soil Investigation Criteria Exceedence Summary

Chemical	Number (count)		Concentration Range (mg/kg)		Number of Adopted Criteria Exceedences *(and criteria mg/kg)*		
	Results	Detects	Min	Max	NSW EPA (1994)	SIL 2	SIL4
Lead	46	43	<5	1500	-	2	1
Total Xylene	54	24	<1	411.3	13	-	-
Benzene	54	27	<0.2	124	21	-	-
Toluene	54	21	<0.5	202	3	-	-
Benzo(a) pyrene	46	32	<0.5	86.2	-	20	20
PAHs (total)	46	42	<8	3403.1	-	20	20
TPH C_6 - C_9	54	21	<10	930	13	-	-
TPH C_{10} - C_{36}	54	37	<50	21,740	21	-	-

10.2.2 Area west of VMP Area

Results with exceedences of the adopted Soil Investigation Criteria for the ORWN (BH407, BH410 and BH411) and ORWS Public Domain (BH412 and BH413) are summarised in Table 9 below.

Table 9: Public Domain and Proposed Southern Cove Soil Investigation Criteria Exceedence Summary

Chemical	Number (count)		Concentration Range (mg/kg)		Number of Adopted Criteria Exceedences *(and criteria mg/kg)*		
	Results	Detects	Min	Max	NSW EPA (1994)	SIL 2	SIL 3
Benzene	32	4	<0.2	1.2	1	-	-
PAH (TOTAL)	28	16	<8	138.6	-	6	5
Benzo(a) pyrene	35	15	<0.5	12.1	-	5	5
TPH C_{10} - C_{36}	36	8	<50	2580	6	-	-

10.2.2.1 Asbestos

A total of eleven samples (collected from locations where buried fill and rubble were identified) were analysed for asbestos during this investigation.

Chrysotile asbestos fibres were detected in two samples, BH401_9.0-9.4 and BH405_12-12.2 and were described in the laboratory reports as containing "*several small fibre bundles*" and "*one small fibre*" respectively.

No fibre cement fragments were observed in BH405_12-12.2 or BH401_9.0-9.4. Both samples were noted to contain demolition rubble including fragments of red brick, concrete and bitumen.

All asbestos results are provided in Table T3 and Table T4 in Appendix B.

10.3 Field Observations - Groundwater

Groundwater was encountered within fill, natural soil and bedrock at the Site. Groundwater levels were relatively shallow (less than 3 m), which was expected based on previous investigations.

DNAPL was not identified in any of the wells sampled in this investigation.

A hydrogen sulphide odour was noted during sampling of MW62.

A tar or hydrocarbon odour was noted during sampling of MW210, MW69, MWIT3D, MW198, MW204S, MW08, MW209, MW200, IT04M, IT04D and IT05D.

A sheen was observed in groundwater purged from MW209, MW198, IT3D and MW69.

Observations made during the purging and sampling of groundwater wells are provided on the field sheets in Appendix G.

10.3.1 Groundwater Level Gauging

Groundwater was encountered at the Site at depths ranging from 1.52 to 2.44 m below ground surface (bgs).

The previous DGIs (AECOM, 2010b and 2010c) reported no distinct flow direction, as expected. Groundwater potentiometric surface contour plans were not developed for the following reasons:

- Groundwater at the Site is subject to tidal fluctuation and the groundwater potentiometric surface would change throughout the tidal cycle;
- Given the large number of groundwater monitoring wells present, there are limitations associated with obtaining depth to groundwater data in a sufficiently short time frame (e.g. at high or low tide) to negate the change in water level associated with tide fluctuations.
- The nature and distribution of fill materials and the presence of subsurface structures (including the caisson wall) are likely to influence groundwater flow.

10.3.2 Groundwater Water Quality Parameters

Field water quality parameters were measured during purging and the results of the water quality measurements and field observations are presented in **Table T5** in Appendix B and are summarised below.

- Dissolved oxygen (DO) in groundwater purged using low flow sampling methodology ranged from 0.01 mg/L (MW62) to 0.48 mg/L (MW200) indicating generally anaerobic conditions.
- Electrical conductivity (EC) of groundwater ranged from 767 µs/cm (MW204S) to 46770 µs/cm (IT07M) indicating the presence of fresh to saline groundwater. Generally groundwater across the Site had the salinity of seawater, with a few exceptions of indicative of fresh to brackish conditions located in proximity to Hickson Road.
- The pH of groundwater ranged from 5.05 to 7.69 with the majority of wells reporting slightly acidic conditions.
- The Oxygen Reduction Potential (Redox) of groundwater ranged from -104.2mV (MW62) to 320.1 mV (IT05D) and indicated a generally reducing environment.

10.4 Groundwater Analytical Results

A register of groundwater samples collected and analysed is provided in Table 1b in Appendix B. Groundwater analytical results are provided in **Table T6** in Appendix B at the rear of this report. Laboratory certificates are provided Appendix H.

A tabulated summary of groundwater results exceeding the Site investigation criteria are provided below in Table 10.

Table 10 Summary of Groundwater Results Exceeding Site Investigation Criteria

Chemical Group	Number		Concentration Range		units	ANZECC (2000) 95% Marine Criteria[1]	
Chemical	Results	Detects	Min	Max		No. Exceedences	Criteria Value
Metals							
Cobalt (Filtered)	25	23	<0.2	145	µg/L	10	1
Copper (Filtered)	25	5	<0.5	30	µg/L	5	1.3
Mercury (Filtered)	25	1	<0.1	0.2	µg/L	1	0.1
Lead (Filtered)	25	15	<0.1	8	µg/L	2	4.4
Nickel (Filtered)	25	21	<0.5	171	µg/L	3	70
Zinc (Filtered)	25	20	<5	456	µg/L	11	15
BTEX							
Benzene	25	10	<1	17,900	µg/L	1	700
PAH/Phenols							
Naphthalene	25	12	<0.1	8580	µg/L	6	70
Phenol	25	3	<0.1	836	µg/L	1	400

Notes

1. ANZECC (2000) Marine Water Quality Guidelines – 95% trigger value adopted (99% adopted for mercury)

Additional analysis of groundwater filtrate, are presented in Table T8 in Appendix B along with respective standard groundwater results. Filter cake analytical results are presented in Table T9 in Appendix B.

Additional analysis of groundwater filtrate and filter cake undertaken for the HHERA are presented in Table T8 and Table T9 in Appendix B. The results will be discussed in the HHERA and are not further discussed in this report.

11.0 Site Characterisation/Site Conceptual Model

11.1 Fill Materials and Natural Soils

- Observed fill materials were consistent with previous investigations and generally comprised unconsolidated gravels, sand, bricks, sandstone, timber, slag and minor other components including glass, plastic and metal fragments in a variable gravelly sand to clayey sand matrix. Fill materials were present above natural silty sands, gravelly sands, clays, weathered sandstone and sand with components of clay overlying sandstone bedrock. These results are generally similar to the previous investigations and confirm the presence highly variable fill material underlying the Declaration Area, thickening to the west towards Darling Harbour.
- Concentrations of CoPC including lead, TPH (C_6-C_9 and C_{10}-C_{36}), BTEX compounds, PAHs (including B(a)P) variably exceeded the adopted Soil investigation criteria. The reported results are generally consistent with the findings of previous investigations with respect to the identified CoPC.
- The reported contamination within the VMP area and the RBZ was identified in fill and natural soils and at the bedrock interface, with highest concentrations just below the fill/natural soil interface, within the natural soil. This is consistent with previous results in that contamination has migrated vertically in the area of the former gasworks footprint and then laterally along the fill/natural soil interface toward Darling Harbour.
- Boreholes located adjacent to the sea wall, reported concentrations of TPH and PAHs exceeding the Site investigation criteria with the exception of BH412, which reported no exceedences in the samples analysed. A hydrocarbon odour in shallow fill materials (3 to 6 m bgs) was observed in Borehole BH412, which corresponded with detections of PAHs.
- The presence of contamination was variably confirmed by the observation of tar and hydrocarbon odours, black staining, surface sheen on groundwater and the presence of tar.
- Asbestos fibres were identified within two soil samples collected from fill containing demolition materials (brick and concrete) within the ORWN and VMP Area. No observations of the source material of the asbestos fibres were observed such as fibre cement sheet fragments.

Based on the reported results, AECOM notes the following regarding the lateral and vertical extent of contamination in fill and natural material:

- As with the previous AECOM DGI's (2010b and 2010c), the maximum concentrations of CoPC were generally located in proximity to and down gradient from the former gasworks in the Declaration Area.
- Elevated concentrations of TPH, BTEX and PAHs and observations of tar staining within natural sediments were noted in all boreholes drilled within the RBZ.
- Sampling and analysis results indicate that asbestos fibres and asbestos containing materials are not widespread throughout the fill, however appear to be randomly distributed in the fill and generally associated with fill containing demolition materials.

11.2 Hydrogeological Conditions

As with previous investigations the results of this investigation indicated that groundwater beneath the Site is present as an unconfined, shallow aquifer within the fill materials and the underlying natural sediments. Groundwater is also likely to occur as a deeper bedrock aquifer within the underlying sandstone bedrock. Groundwater within the bedrock would occur as a fractured bedrock aquifer, potentially confined by an overlying clay unit in some areas of the Site.

Due to the proximity of the Site to Darling Harbour, the depth to groundwater is shallow and the overall direction of groundwater flow is expected to be towards Darling Harbour. Groundwater at the Site is tidally influenced, resulting in the fluctuation of groundwater levels within the fill materials and natural sediments.

11.3 Conceptual Site Model Update

Based on the combined ERM, Coffey and AECOM dataset, the AECOM EPA Declaration Area DGI (2010b) and ORWN Area DGI (2010c) made the following points to provide an update to the conceptual site model:

- The AECOM (2010b) investigation reported free tar and other fill materials contaminated with CoPC in a number of locations within the former gasworks area, indicating these locations were source areas for contamination.
- The results from locations outside the Declaration Area indicate that gasworks related contamination has migrated outside the Declaration boundary. .
- The deeper contamination reported in the area west of the VMP and RBZ Areas has been confirmed as being present in the natural soil immediately underlying the fill material.
- The conceptual model depicted in ERM (2008) Figure 20 generally fits with the exception of deep bedrock contamination (discussed below). AECOM DGI boreholes did not generally extend into bedrock and therefore the deep bedrock contamination interpreted in ERM BH205, BH206 and BH209 has not been confirmed.

Review of the ERM borelogs and soil data indicates that the highly impacted zones of contamination appear to be in the natural soil at the bedrock interface and decrease with depth. Because the wells installed in BH206 and BH209 are screened across the natural soil and sandstone bedrock (as indicated in the borelogs) and there is no evidence for deep contamination in BH205 (other than tar in the well which could be related to well completion issues given the difficult nature of the drilling at the Barangaroo Site), AECOM considers that the overall site dataset does not support the presence of significant deep bedrock contamination.

The combined dataset indicates that the highly impacted zone is generally at the base of the fill material, through the natural soil and into the top of the sandstone. This would be expected at a DNAPL site where highly variable and permeable fill material overlies a relatively less permeable natural soil/bedrock. The DNAPL would migrate downwards and pool/adsorb on a less permeable underlying strata. It is also noted that given the high tidal connectivity of the fill material, lower concentrations in the fill material would be expected, with the higher concentrations remaining in the lower permeable material with less connectivity (supported by AECOM 2010c).

This supplementary DGI indicates the following:

- Observations of tar and tarry/strong hydrocarbon odour with sheen on sampled material were observed within natural materials outside the VMP Area, in boreholes BH400 to BH406.
- Observations of contamination were observed in boreholes close to the sea wall, down-gradient of the VMP Area. The contamination was identified within fill and at the fill/natural interface, however concentrations were an order of magnitude less than the boreholes located within the RBZ and VMP area, with PID readings and observations of odour and staining significantly less than the RBZ and VMP area.

12.0 Conclusions

The Supplementary VMP DGI has made the following main findings:

- Tar impacted soil was identified at and below the fill and natural soil interface in boreholes BH400 to BH406, located in the 30 m RBZ.
- Concentrations of CoPC including lead, TPH, BTEX, and PAHs exceeded the soil investigation criteria at each location (BH400 to BH413), with the exception of BH412.
- Observations of contamination and PID readings were consistent with analytical results.
- Asbestos fibre bundles were identified in fill materials BH405 and BH401. Potential asbestos containing material such as fibre cement fragments were not observed in any sample collected.
- Concentrations of CoPC variably exceeded the adopted groundwater assessment criteria in existing and newly installed monitoring wells, with the highest concentrations within the vicinity of the VMP area and RBZ.

AECOM considers that this supplementary DGI has provided sufficient data and information for the RAP to refine the extent of remediation works required within the VMP Area and the potential extent of remediation works or barrier walls associated with a 30 m RBZ outside the VMP Area.

AECOM also considers that sufficient data and information have been obtained to provide spatial data closer to the VMP Area and laterally behind the existing caisson wall which will inform the risk assessment process with respect the nature and extent of contaminant discharge from the VMP Area to Darling Harbour including likely contaminant concentrations at the point of discharge and an indication of overall contaminant mass flux.

Conclusions regarding the recommended extent of remediation works required for removal of the EPA Declaration will be provided in the VMP RAP to be prepared for the VMP Area.

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Appendix A

Figures

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information

PROJECT ID: 60153531 CREATED BY: TO LAST MODIFIED: TO 09 06 2011 AECOM www.aecom.com 0 600m		**Site Location** **Lend Lease (Millers Point) Pty Ltd** *Supplementary VMP Data Gap Investigation* Barangaroo Hickson Road, Millers Point NSW **Figure F1**

Map Document: G:\601\60153531 Barangaroo\FIGURES\Supplementary Data Gap Investigation\60153531 F1 Site Location Rev B

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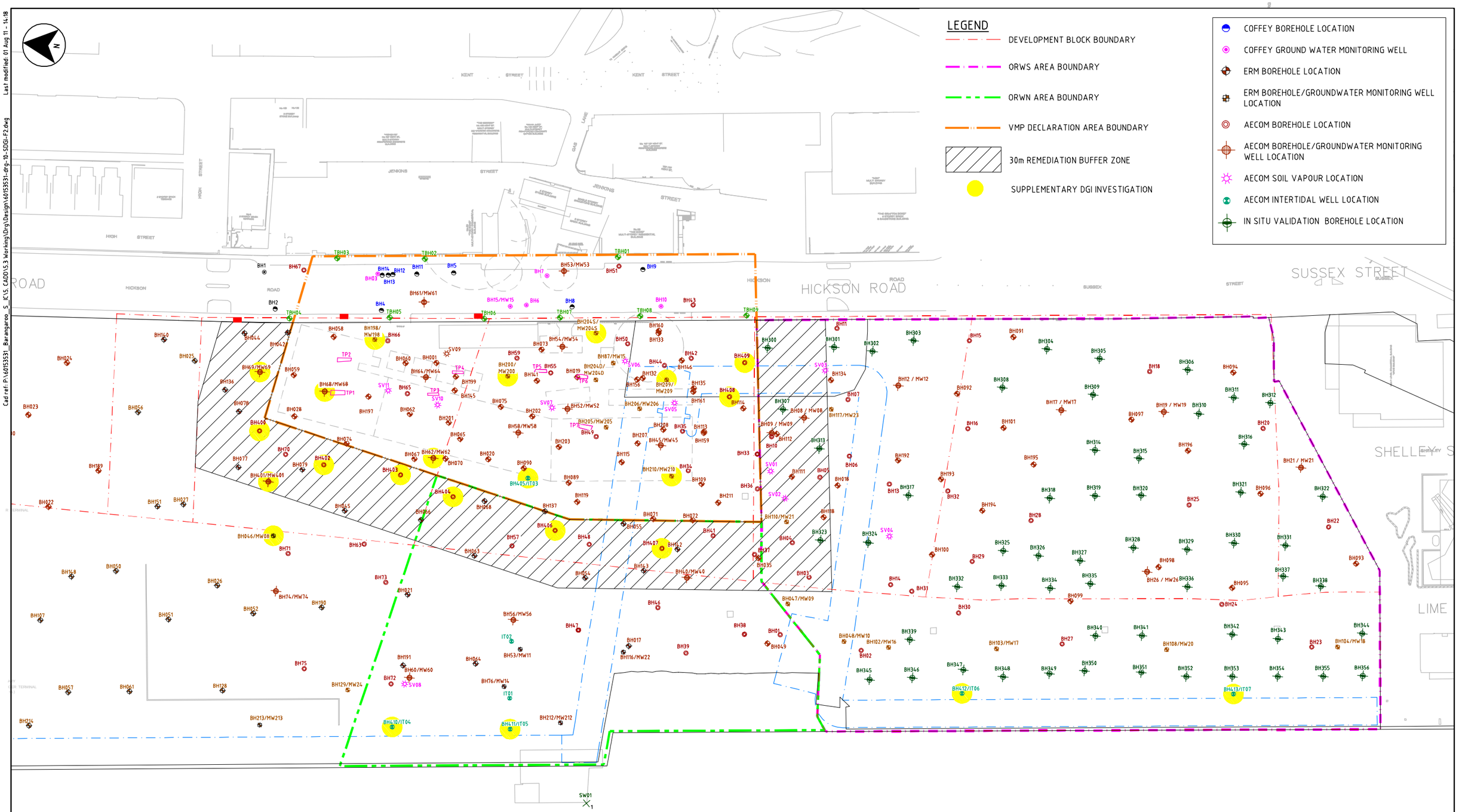

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SUPPLEMENTARY VMP DGI

FIGURE F2:
SITE LAYOUT

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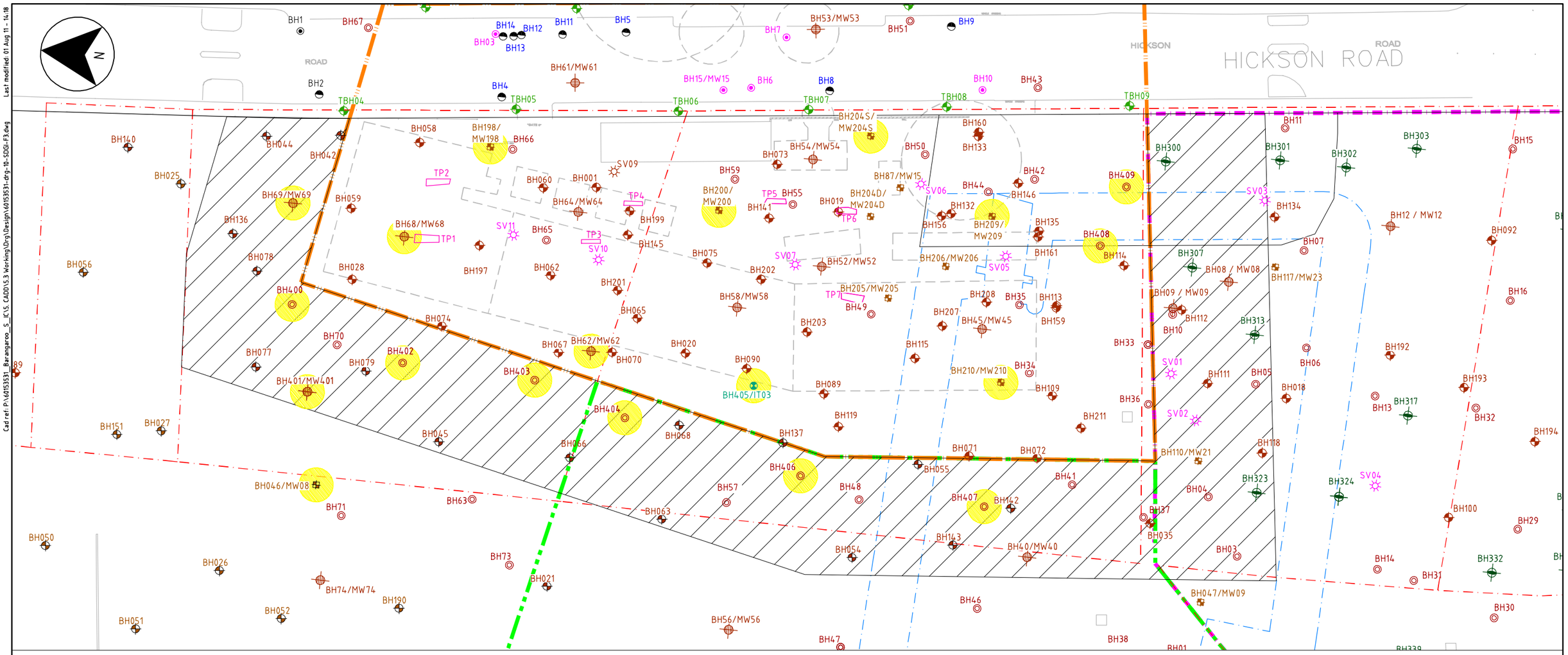

	Location	BH400	BH401	BH401	BH402	BH402	BH402	BH402	BH402	BH403	BH403	BH403	BH403	BH403	BH403	BH403
	Depth	16-16.4	14-14.2	19.2-19.4	9-9.3	14-14.5	15-15.5	17-17.4	19.1-19.4	4-4.4	8-8.4	10-10.4	12-12.4	15-15.4	16-16.4	17-17.3
	Sample Date	14/02/2011	10/02/2011	11/02/2011	9/02/2011	9/02/2011	9/02/2011	10/02/2011	10/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011
Analyte	SAC															
Lead	1200	**1500**		1490		**1500**										
TPH C6 - C9	65	**65**	**331**				**66**	**67**	**470**				**930**	**651**	**95**	**434**
TPH+C10 - C36	1000	**100**	9410	2900	**1650**		2910		9390		3320	13770	12,300	21700	9340	18180	6070
Benzene	1	**1**	**40.3**		**1.4**		**6.2**	**3.7**	**63.4**	**2.9**		**4.2**	**83.7**	**124**	**7**	**60**	**1.5**
Toluene	130	**130**			5.9								**202**	**145**			
Total Xylene	25	**25**	**116.1**		10.1		**27.8**	**29**	**174.1**				**411.3**	**179.2**	**50**	**157.3**	
Benzo(a) pyrene	4	**5**	**26**	**13.5**	**8.5**		**11**		**69.6**			**70.5**		**60.9**		**68.4**	**27.2**
PAH (TOTAL)	80	**100**	**1992.3**	**156.4**	**370.4**		**471.9**		**2865.2**	**106.5**	90.4	**1543.2**		**3215**		**2934.8**	**1178.7**
Dibenzofuran	78	**1000**											222		130		

	Location	BH404	BH404	BH404	BH404	BH405	BH405	BH405	BH406	BH406	BH406	BH408	BH408	BH409	BH409
	Depth	0.4-0.5	7-7.4	14-14.4	15-15.4	4-4.3	13-13.2	14-14.4	14-14.4	15-15.4	16-16.5	2-2.4	9-9.4	5-5.3	7-7.3
	Sample Date	8/02/2011	8/02/2011	8/02/2011	8/02/2011	10/02/2011	11/02/2011	11/02/2011	8/02/2011	8/02/2011	9/02/2011	14/02/2011	15/02/2011	14/02/2011	15/02/2011
Analyte	SAC														
TPH C6 - C9	65	**65**			**125**				**156**		**190**	**861**				**106**
TPH+C10 - C36	1000	**100**		7710	2060		1020	2830	12400	1410	4830	5840		1220		
Benzene	1	**1**			**11.5**	**1.2**			**5.9**	**3.8**	**15.1**	**85**		**2.1**	**1.8**	**2.8**
Toluene	130	**130**										**140**				
Total Xylene	25	**25**			**35.1**				**76.6**		**50**	**171.8**				**26.7**
Benzo(a) pyrene	4	**5**	**6.2**	**52.7**	**11.6**		**5.9**	**21.6**	**86.2**	**50.8**	**24.2**	**78.1**	**6.3**	**5.6**		
PAH (TOTAL)	80	**100**	86.6	**1419.4**	**371.4**			**750.2**	**3296.3**	**1132.6**	**1064**	**3403.1**		**252.6**		

LEGEND

- DEVELOPMENT BLOCK BOUNDARY
- ORWS AREA BOUNDARY
- ORWN AREA BOUNDARY
- VMP AND PDA DECLARATION AREA BOUNDARY
- 30m REMEDIATION BUFFER ZONE
- SUPPLEMENTARY DGI INVESTIGATION
- COFFEY BOREHOLE LOCATION
- COFFEY GROUND WATER MONITORING WELL
- ERM BOREHOLE LOCATION
- ERM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM SOIL VAPOUR LOCATION
- AECOM INTERTIDAL WELL LOCATION
- IN SITU VALIDATION BOREHOLE LOCATION

Criteria and results are expressed in mg/kg
SAC = Soil Assessment Criteria
Result shaded grey = Result > Adopted Residential Criteria
Result shaded grey and bold= Result > Adopted Residential Criteria and Commercial/Industrial Criteria

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SUPPLEMENTARY VMP DGI

FIGURE F3: SOIL EXCEEDENCES
SUPPLEMENTARY DGI LOCATIONS WITHIN VMP AREA
RBZ AREA AND ADJASANT TO RBZ AREA

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	Location_Code	BH407	BH410	BH410	BH411	BH411	BH413	BH413	BH413
	Sample_Depth	18-18.3	7-7.2	17-17.5	15-15.1	18-18.1	1.1-1.3	4-4.2	15-15.5
	Sampled_Date	14/02/2011	10/05/2011	11/05/2011	12/04/2011	12/04/2011	1/04/2011	1/04/2011	5/04/2011
Analyte	**SAC**								
TPH+C10 - C36	1000	**1000**	<50	**1130**	**1820**	**1310**	**1950**	900	**2580**	**1550**
Benzene	1	**1**	**1.2**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a) pyrene	2	**4**	<0.5	<0.5	**7.7**	<0.5	**6.8**	**12.1**	**8.9**	**8**
PAH (TOTAL)	40	**80**	<8		**60.7**	8.9	**82.6**	**138.6**	**112.6**	**82.8**

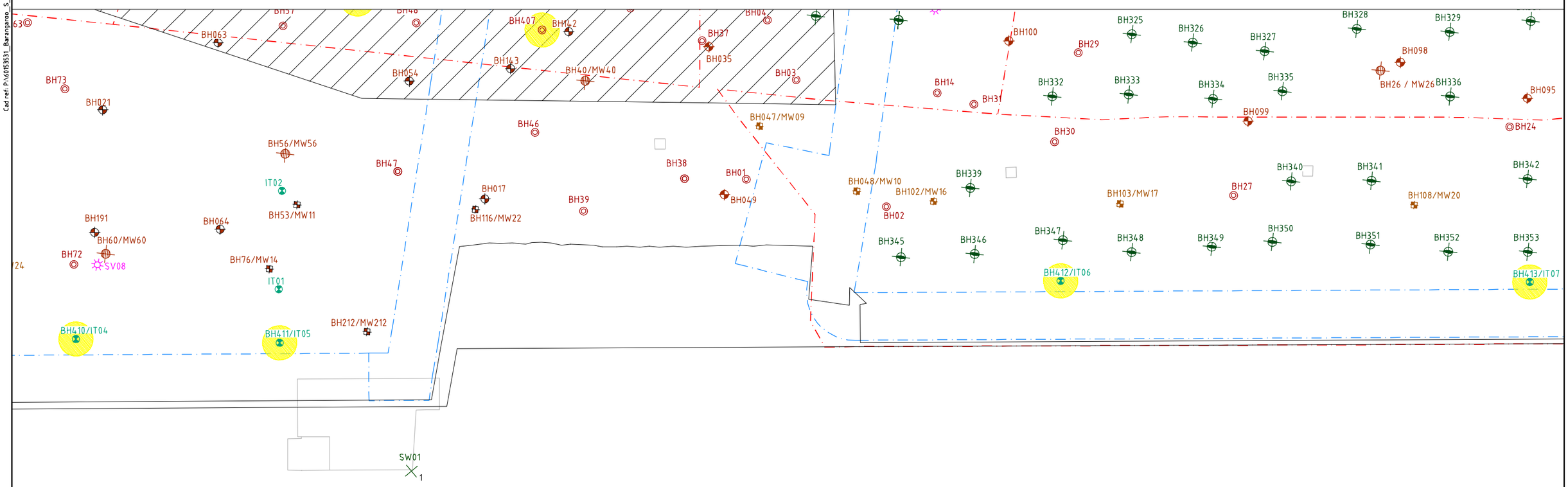
LEGEND

- DEVELOPMENT BLOCK BOUNDARY
- ORWS AREA BOUNDARY
- ORWN AREA BOUNDARY
- VMP AND PDA DECLARATION AREA BOUNDARY
- 30m REMEDIATION BUFFER ZONE
- SUPPLEMENTARY DGI INVESTIGATION
- COFFEY BOREHOLE LOCATION
- COFFEY GROUND WATER MONITORING WELL
- ERM BOREHOLE LOCATION
- ERM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM SOIL VAPOUR LOCATION
- AECOM INTERTIDAL WELL LOCATION
- IN SITU VALIDATION BOREHOLE LOCATION

Criteria and Results are expressed in mg/kg

Result shaded grey = Result > Adopted Public Domain Criteria

Result shaded grey and bold= Result > Adopted Public Domain Criteria and Residential Criteria



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SUPPLEMENTARY VMP DGI

FIGURE F4: SOIL EXCEEDENCES
WEST AND DOWN-GRADIENT OF THE VMP AREA

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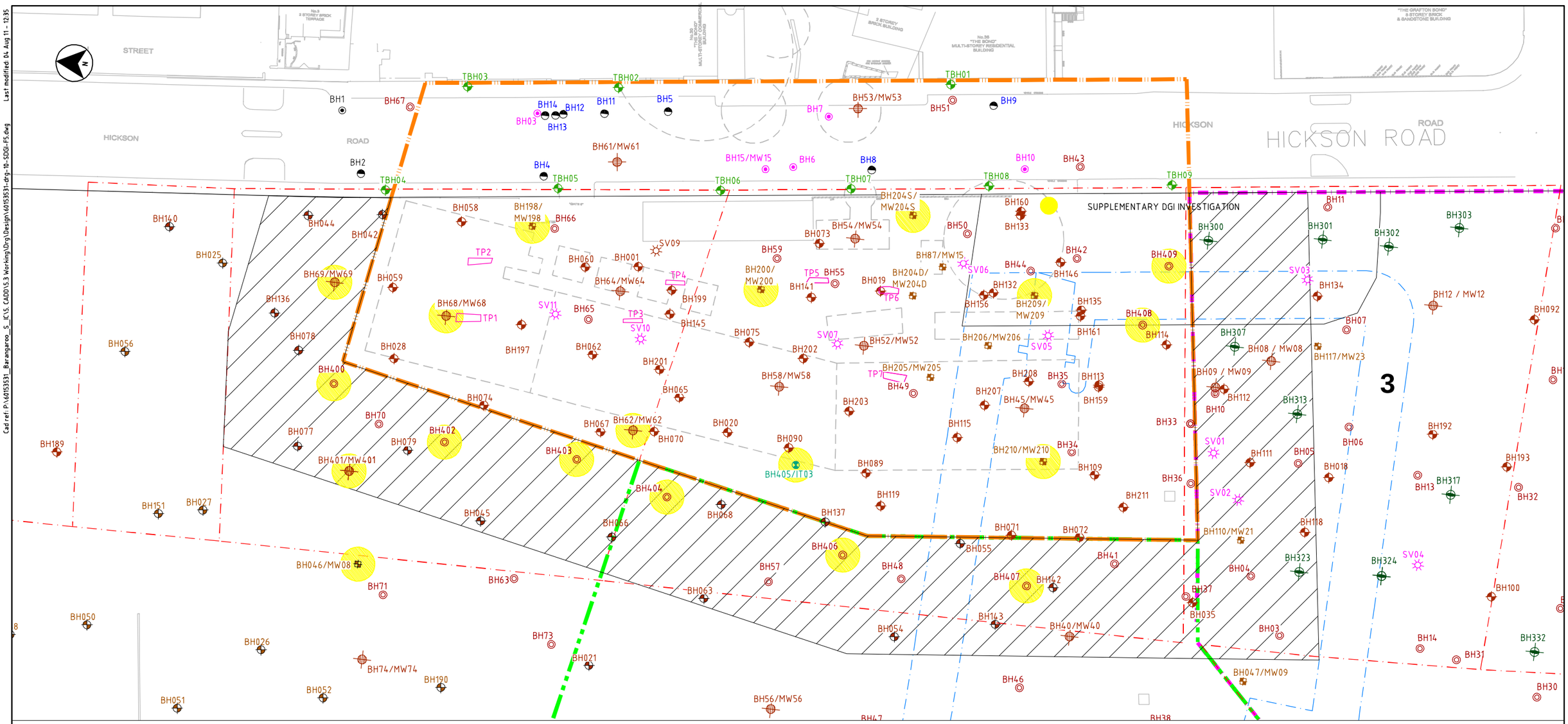

	Location	BH405	BH405	BH405	BH200	BH204	BH210	BH401	BH69
	Well	IT3D	IT3M	IT3S	MW200	MW204S	MW210	MW401	MW69
	Sample Date	25/02/2011	25/02/2011	25/02/2011	28/02/2011	25/02/2011	24/02/2011	24/02/2011	25/02/2011
Analyte	Units	GAC							
Benzene	µg/L	700				17,900			
Cobalt (Filtered)	µg/L	1				1.5	1.2		1.6
Copper (Filtered)	µg/L	1.3					3.1		
Mercury (Filtered)	µg/L	0.1*				0.2			
Nickel (Filtered)	µg/L	70					72.1	164	
Zinc (Filtered)	mg/L	0.015		0.046	0.017		0.019	0.016	0.016
Naphthalene	µg/L	70	2560			5450	8580		195	202
Phenol	µg/L	400				836			

GAC = Groundwater Assessment Criteria - ANZECC Water Quality Guidelines (2000) 95% Marine (99% for mercury).
Filtrate = Twice filtered by laboratory before analysis

LEGEND

- DEVELOPMENT BLOCK BOUNDARY
- ORWS AREA BOUNDARY
- ORWN AREA BOUNDARY
- VMP AND PDA DECLARATION AREA BOUNDARY
- 30m REMEDIATION BUFFER ZONE
- SUPPLEMENTARY DGI INVESTIGATION
- COFFEY BOREHOLE LOCATION
- COFFEY GROUND WATER MONITORING WELL
- ERM BOREHOLE LOCATION
- ERM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM SOIL VAPOUR LOCATION
- AECOM INTERTIDAL WELL LOCATION
- IN SITU VALIDATION BOREHOLE LOCATION

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SUPPLEMENTARY VMP DGI

FIGURE F5: GROUNDWATER EXCEEDENCES WITHIN AND ADJACENT TO THE VMP AND RBZ AREAS

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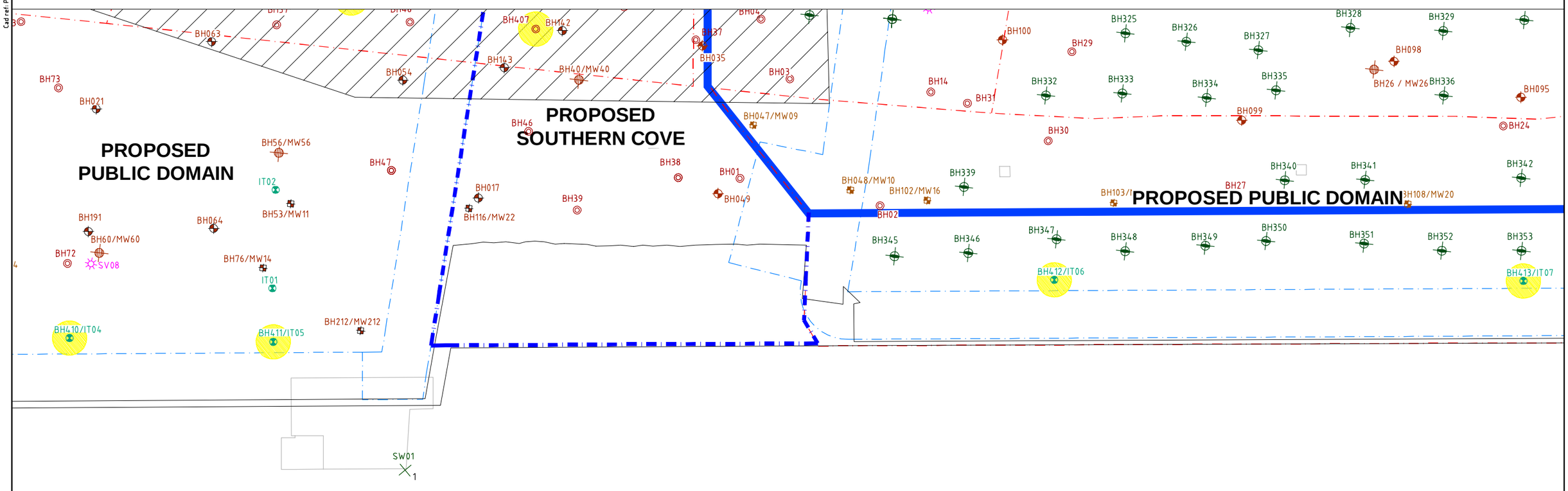
	Location	BH410	IT04M	BH410	BH411	BH411	BH411	BH412	BH412	BH413	BH413	BH413
	Well	IT04S	IT04M	IT04D	IT05S	IT05M	IT05D	IT06S	IT06D	IT07D	IT07S	IT07M
	Sample Date	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	20/04/2011	20/04/2011	19/04/2011	19/04/2011	19/04/2011
	Sample Type	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard	Standard
Analyte	units	GAC										
Lead (Filtered)	µg/L	4.4						8		6.4			
Chromium (Filtered)	µg/L	4.4		17								
Cobalt (Filtered)	µg/L	1		2	45.5			145	1.5	17.5	1.9	14.1	2.4
Copper (Filtered)	µg/L	1.3	30	10	24		2					4	
Nickel (Filtered)	µg/L	70						171					
Zinc (Filtered)	mg/L	0.015	0.018		0.09	0.036		0.456		0.167		0.027	
Naphthalene	µg/L	70						80.2					

LEGEND

- DEVELOPMENT BLOCK BOUNDARY
- PROPOSED SOUTHERN COVE BOUNDARY (SUBJECT TO FURTHER DESIGN AND DEVELOPMENT)
- BASEMENT GROUNDWATER RETENTION WALL SYSTEM
- 30m REMEDIATION BUFFER ZONE
- 1 PROPOSED DEVELOPMENT BLOCK NUMBER
- SUPPLEMENTARY DGI INVESTIGATION
- COFFEY BOREHOLE LOCATION
- COFFEY GROUND WATER MONITORING WELL
- ERM BOREHOLE LOCATION
- ERM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM BOREHOLE LOCATION
- AECOM BOREHOLE/GROUNDWATER MONITORING WELL LOCATION
- AECOM SOIL VAPOUR LOCATION
- AECOM INTERTIDAL WELL LOCATION
- IN SITU VALIDATION BOREHOLE LOCATION

GAC = Groundwater Assessment Criteria - ANZECC Water Quality Guidelines (2000) 95% Marine
Filtrate = Twice filtered by laboratory before analysis
S= Shallow piezometer
M = Intermediate depth piezometer
D = Deep piezometer



This drawing is confidential and shall only be used for the purposes of this project.

REVISIONS				
No.	BY	DATE	DESCRIPTION	APPD

SCALES: NOT TO SCALE

THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAFTING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE AECOM QUALITY ASSURANCE SYSTEM TO ISO 9001-2000

DESIGNED		CHECKED	
DRAWN	SS	CHECKED	JA
APPROVED	AD	DATE	

DESIGNER: AECOM

AECOM Australia Pty Ltd A.B.N. 20 093 846 925

SUPPLEMENTARY VMP DGI

FIGURE F6: GROUNDWATER EXCEEDENCES WEST AND DOWN-GRADIENT OF THE VMP AREA

STATUS: DRAFT

DRAWING NO: 60153531-DRG-10-SDGI-F6

REV: -

Appendix B

Tables

AECOM

Table T1a
Sample Register
Soil Samples and Rinsate Samples

Location	Field ID	Matrix	TPH/BTEX/PAH/Metals	Asbestos	TCLP	ASLP
BH400	BH400_0.5-0.6	FILL				
	BH400_1.0-1.1	FILL				
	BH400_2.0-2.4	FILL				
	BH400_3.0-3.4	FILL				
	BH400_4.0-4.4	FILL		1		
	BH400_5.0-5.4	FILL				
	BH400_6.0-6.4	FILL	1			
	BH400_7.0-7.4	FILL				
	BH400_8.0-8.4	FILL				
	BH400_9.0-9.4	FILL	1			
	BH400_10-10.4	FILL				
	BH400_11-11.4	FILL				
	BH400_12-12.4	FILL	1			
	BH400_13.2-13.4	Natural Soil	1			
	BH400_14-14.2	Natural Soil	1			
	BH400_15-15.4	Natural Soil				
	BH400_16 - 16.4	Natural Soil	1			
BH401	BH401_0.5-0.6	FILL				
	BH401_ 1.0-1.1	FILL				
	BH401_ 3.0-3.4	FILL	1	1		
	BH401_ 4.0-4.4	FILL				
	BH401_ 5.0-5.4	FILL	1			
	BH401_ 6.0-6.4	FILL				
	BH401_ 7.0-7.4	FILL				
	BH401_ 8.0-8.4	FILL				
	BH401_ 9.0-9.4	FILL		1		
	BH401_ 10-10.4	FILL				
	BH401_ 11-11.4	FILL	1			
	BH401_ 12-12.4	FILL				
	BH401_ 13-13.4	FILL	1			
	BH401_ 14-14.2	Natural Soil	1			
	BH401_ 14.2-14.4	Natural Soil				
	BH401_ 15-15.4	Natural Soil				
	BH401_ 16-16.4	Natural Soil				
	BH401_ 17-17.4	Natural Soil	1			
	BH401_18-18.4	Natural Soil				
	BH401_19.2-19.4	Natural Soil	1			
	BH401_20-20.15	Natural Soil				
BH402	BH402_0.5-0.6	FILL				
	BH402_1.0-1.1	FILL	1			
	BH402_4.0-4.2	FILL		1		
	BH402_5.0-5.2	FILL				
	BH402_8.0-8.2	FILL				
	BH402_9.0-9.3	FILL	1			
	BH402_10-10.2	FILL				
	BH402_11-11.2	FILL	1			
	BH402_12-12.1	FILL				
	BH402_13-13.2	FILL				
	BH402_14-14.5	Natural Soil	1			
	BH402_15-15.5	Natural Soil				
	BH402_16-16.3	Natural Soil				
	BH402_17-17.4	Natural Soil	1			
	BH402_18.1-18.3	Natural Soil				
	BH402_19.1-19.4	Natural Soil	1			
BH403	BH403_0.4-0.5	FILL				
	BH403_ 1.0-1.1	FILL				
	BH403_ 2.0-2.4	FILL	1			
	BH403_ 3.0-3.4	FILL				
	BH403_ 4.0-4.4	FILL	1	1		
	BH403_ 5.0-5.4	FILL				
	BH403_ 6.0-6.4	FILL				
	BH403_ 8.0-8.4	Natural Soil	1		1	1
	BH403_ 9.0-9.4	Natural Soil				
	BH403_ 10-10.4	Natural Soil				
	BH403_ 11-11.4	Natural Soil				
	BH403_ 12-12.4	Natural Soil	1		1	1
	BH403_ 13-13.4	Natural Soil				
	BH403_ 14-14.4	Natural Soil				
	BH403_ 15-15.4	Natural Soil				
	BH403_ 16-16.4	Natural Soil	1			
	BH403_17-17.3	Natural Soil	1			
BH404	BH404_0.4-0.5	FILL	1	1		
	BH404_1.0-1.1	FILL				
	BH404_2.0-2.4	FILL				
	BH404_3.0-3.4	FILL				
	BH404_4.0-4.4	FILL	1			
	BH404_6.0-6.4	FILL				
	BH404_7.0-7.4	FILL	1			
	BH404_9.0-9.4	FILL				
	BH404_10-10.4	FILL				
	BH404_12-12.4	FILL	1			
	BH404_13-13.4	FILL				
	BH404_14-14.4	Natural Soil	1			
	BH404_15-15.4	Natural Soil	1			
BH405	BH405_0.5-0.55	FILL				
	BH405_1.1-1.4	FILL				
	BH405_3.0-3.15	FILL				
	BH405_4.0-4.3	FILL	1			
	BH405_6.0-6.1	FILL				
	BH405_7.0-7.3	FILL	1		1	1

Data Entry: KM
Data Review: BE
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Table T1a
Sample Register
Soil Samples and Rinsate Samples

Location	Field ID	Matrix	TPH/BTEX/PAH/Metals	Asbestos	TCLP	ASLP
	BH405_8.0-8.2	FILL				
	BH405_9.1-9.3	FILL				
	BH405_12.0-12.2	FILL	1	1		
	BH405_13-13.2	Natural Soil	1			
	BH405_14-14.4	Natural Soil	1			1
BH406	BH406_0.5-0.55	FILL				
	BH406_1.0-1.1	FILL				
	BH406_2.0-2.2	FILL				
	BH406_3.0-3.2	FILL				
	BH406_4.0-4.2	FILL	1			
	BH406_7.0-7.4	FILL	1	1		1
	BH406_8.0-8.5	FILL				
	BH406_10-10.3	FILL	1			
	BH406_12.0-12.1	FILL				
	BH406_13.0-13.2	FILL				
	BH406_14-14.4	FILL	1			
	BH406_15.0-15.4	Natural Soil	1			
	BH406_16.0-16.5	Natural Soil	1		1	1
BH407	BH407_0.6-0.65	FILL				
	BH407_1.0-1.3	FILL		1		
	BH407_5.0-5.1	FILL				
	BH407_8.0-8.1	FILL	1			
	BH407_9.0-9.1	FILL				
	BH407_12.0-12.18	FILL	1			
	BH407_13.0-13.2	Natural Soil				
	BH407_14.0-14.5	Natural Soil	1			
	BH407_15.1-15.45	Natural Soil				
	BH407_16.3-16.5	Natural Soil	1			
	BH407_17.4-17.6	Natural Soil	1			
	BH407_18.0-18.3	Natural Soil	1			
BH408	BH408_0.5-0.55	FILL				
	BH408_1.0-1.4	FILL				
	BH408_ 2.0-2.4	FILL	1	1		1
	BH408_ 4.0-4.4	FILL				
	BH408_ 5.0-5.18	FILL				
	BH408_ 8.0-8.3	Natural Soil	1			
	BH408_9.0-9.4	Natural Soil	1			1
BH409	BH409_0.5-0.55	FILL				
	BH409_1.0-1.3	FILL		1		
	BH409_3.7-4.0	FILL	1		1	1
	BH409_4.1-4.3	Natural Soil				
	BH409_5.0-5.3	Natural Soil	1			
	BH409_6.0-6.4	Natural Soil				
	BH409_7.0-7.3	Natural Soil	1			1
BH410	BH410_0.2-0.4	FILL				
	BH410_1.2-1.4	FILL				
	BH410_2.0-2.2	FILL	1			
	BH410_4.0-4.1	FILL				
	BH410_5.0-5.1	FILL				
	BH410_7.0-7.2	FILL	1			
	BH410_11.0-11.2	FILL				
	BH410_13.0-13.2	FILL				
	BH410_15.0-15.2	FILL				
	BH410_17.0-17.5	Natural Soil	1			
	BH410_18.0-18.2	Natural Soil				
	BH410_19.0-19.2	Natural Soil				
	BH410_20.0-20.2	Natural Soil				
	BH410_21.0-21.2	Natural Soil				
	BH410_22.0-22.2	Natural Soil				
	BH410_23.0-23.2	Natural Soil	1			
	BH410_24.0-24.2	Natural Soil				
	BH410_25.0-25.2	Natural Soil				
	BH410_26.0-26.2	Natural Soil	1			
	BH410_27.0-27.2	Natural Soil				
	BH410_28.0-28.1	Natural Soil				
	BH410_29.0-29.2	Natural Soil				
	BH410_30.0-30.2	Natural Soil				
	BH410_31.0-31.2	Natural Soil				
	BH410_32.0-32.2	Natural Soil	1			
BH411	BH411_1.0-1.1	FILL				
	BH411_2.0-2.1	FILL	1			
	BH411_3.1-3.2	FILL	1			
	BH411_4.0-4.1	FILL	1			
	BH411_5.0-5.1	FILL				
	BH411_7.0-7.1	FILL				
	BH411_8.0-8.1	FILL	1			
	BH411_10.0-10.1	FILL	1			
	BH411_15.0-15.1	FILL	1			
	BH411_16.0-16.1	FILL				
	BH411_18.0-18.1	Natural Soil	1			
	BH411_19.0-19.1	Natural Soil	1			
	BH411_20.0-20.1	Natural Soil				
	BH411_21.0-21.1	Natural Soil				
	BH411_22.0-22.1	Natural Soil				
	BH411_23.0-23.1	Natural Soil	1			
	BH411_24.0-24.1	Natural Soil				
	BH411_25.0-25.1	Natural Soil				
	BH411_26.0-26.1	Natural Soil	1			
BH412	BH412_0.5-0.6	FILL				
	BH412_1.1-1.3	FILL				

Data Entry: KM
Data Review: BE
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Table T1a
Sample Register
Soil Samples and Rinsate Samples

Location	Field ID	Matrix	TPH/BTEX/PAH/Metals	Asbestos	TCLP	ASLP
	BH412_2.0-2.2	FILL				
	BH412_3.0-3.1	FILL	1			
	BH412_4.0-4.1	FILL	1			
	BH412_6.0-6.1	FILL				
	BH412_7.0-7.2	FILL				
	BH412_8.0-8.1	FILL	1			
	BH412_10.0-10.1	FILL				
	BH412_11.0-11.2	FILL	1			
	BH412_14.0-14.1	FILL				
	BH412_18.0-18.1	Natural Soil				
	BH412_19.0-19.3	Natural Soil	1			
	BH412_20.0-20.2	Natural Soil				
	BH412_21.0-21.2	Natural Soil				
	BH412_22.0-22.2	Natural Soil	1			
BH413	BH413_0.5-0.6	FILL				
	BH413_1.1-1.3	FILL	1			
	BH413_2.0-2.3	FILL				
	BH413_4.0-4.2	FILL	1			
	BH413_5.0-5.15	FILL				
	BH413_6.0-6.15	FILL	1			
	BH413_8.0-8.1	FILL				
	BH413_9.0-9.2	FILL	1			
	BH413_10.0-10.2	FILL				
	BH413_15.0-15.5	Natural Soil	1			
	BH413_16.0-16.2	Natural Soil				
	BH413_16.4-16.6	Natural Soil	1			
		Total	**82**	**11**	**5**	**10**
Field Soil Duplicate Samples						
Field ID	**QA/QC Sample Typ**	**Parent Sample**				
QC600	Duplicate	BH406_8.0-8.5				
QC602	Duplicate	BH406_15-15.4	1			
QC604	Duplicate	BH402_14-14.5				
QC606	Duplicate	BH402_17.0-17.4	1			
QC609	Duplicate	BH405_14-14.4	1			
QC610	Duplicate	BH407_14-14.5	1			
QC613	Duplicate	BH408_9.0-9.4	1			
QC622	Duplicate	BH413_15-15.3	1			
QC627	Duplicate	BH412_19.0-19.3	1			
QC632	Duplicate	BH411_18-18.1	1			
QC639	Duplicate	BH410_17-17.5	1			
QC650	Duplicate	BH402_1-1.1				
QC652	Duplicate	BH404_12-12.4				
QC653	Duplicate	BH404_14-14.4	1			
QC656	Duplicate	BH403_8-8.4	1			
QC657	Duplicate	BH403_9-9.4				
QC658	Duplicate	BH403_11-11.4				
QC660	Duplicate	BH403_13-13.4				
QC663	Duplicate	BH401_18-18.4				
		Total	**11**	**0**	0	0
Field Soil Inter-laboratory Triplicate Samples						
QC601	Triplicate	BH406_8.0-8.5				
QC603	Triplicate	BH406_15-15.4	1			
QC605	Triplicate	BH402_14-14.5				
QC607	Triplicate	BH402_17.0-17.4	1			
QC611	Triplicate	BH407_14-14.5	1			
QC614	Triplicate	BH408_9.0-9.4				
QC623	Triplicate	BH413_15-15.3	1			
QC628	Triplicate	BH412_19.0-19.3	1			
QC651	Triplicate	BH402_1-1.1				
QC654	Triplicate	BH404_14-14.4				
QC659	Triplicate	BH403_11-11.4				
QC661	Triplicate	BH403_13-13.4				
QC664	Triplicate	BH401_18-18.4	1			
		Total	**6**			
Rinsate Samples						
QC608	Rinsate	10/2/2011	1			
QC612	Rinsate	15/2/2011	1			
QC655	Rinsate	08/2/2011	1			
QC662	Rinsate	09/2/2011	1			
QC665	Rinsate	11/2/2011	1			
QC666	Rinsate	14/2/2011	1			
QC621	Rinsate	01/4/2011	1			
QC624	Rinsate	05/4/2011	1			
QC625	Rinsate	06/4/2011	1			
QC626	Rinsate	07/4/2011	1			
QC629	Rinsate	08/4/2011	1			
QC630	Rinsate	12/4/2011	1			
QC633	Rinsate	13/04/2011	1			
QC635	Rinsate	14/04/2011	1			
QC636	Rinsate	19/04/2011	1			
QC637	Rinsate	20/04/2011	1			
QC646	Rinsate	19/05/2011	1			
		Total	**17**	**0**	**0**	**0**

Data Entry: KM
Data Review: BE
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Table T1b
Sample Register
Groundwater Samples

Location	Field ID	Matrix	Sampled_Date_Time	TPH/BTEX/metals*/PAHs/Phenols/ Cyanide	Ammonia	Styrene	Filtrate and Filter Paper
BH62	MW62	Water	24/2/2011	1			1
BH68	MW68	Water	24/2/2011	1			1
BH69	MW69	Water	25/2/2011	1			1
BH046	MW08	Water	28/2/2011	1			1
BH198	MW198	Water	25/2/2011	1			1
BH200	MW200	Water	25/2/2011	1			1
BH204	MW204S	Water	28/2/2011	1			1
BH209	MW209	Water	28/2/2011	1			1
BH210	MW210	Water	24/2/2011	1			1
BH401	MW401	Water	24/2/2011	1			1
BH405	IT3D	Water	25/2/2011	1			1
BH405	IT3M	Water	25/2/2011	1			1
BH405	IT3S	Water	25/2/2011	1			1
BH410	IT04S	Water	19/5/2011	1	1	1	1
BH410	IT04M	Water	19/5/2011	1	1	1	1
BH410	IT04D	Water	19/5/2011	1	1	1	1
BH411	IT05S	Water	19/5/2011	1	1	1	1
BH411	IT05M	Water	19/5/2011	1	1	1	1
BH411	IT05D	Water	19/5/2011	1	1	1	1
BH412	IT06_Shallow	Water	20/4/2011	1	1		1
BH412	IT06_MID	Water	20/4/2011	1	1		1
BH412	IT06_DEEP	Water	20/4/2011	1	1		1
BH413	IT07_Shallow	Water	19/4/2011	1			1
BH413	IT07_MID	Water	19/4/2011	1			1
BH413	IT07_DEEP	Water	19/4/2011	1			1
			Total	**25**	9	6	25
QA/QC Samples							
Location	**Field ID**	**Matrix**	**Sampled_Date_Time**	**TPH/BTEX/metals*/PAHs/Phenols/ Cyanide**	**Ammonia**	**Styrene**	**Filtrate**
Field Groundwater Duplicate Samples							
BH401/MW01	QC615	Water	24/2/2011	1			1
BH412/IT05D	QC643	Water	19/5/2011	1			
BH198/MW198	QC618	Water	25/2/2011	1			1
BH410/IT04	QC644	Water	19/5/2011	1			
			Total	**4**			2
Field Groundwater Inter-laboratory Triplicate Samples							
BH401	QC616	Inter-lab -Water	24/2/2011	1			
BH410	QC645	Inter-lab -Water	19/5/2011	1			
			Total	**2**			

data Entry: KM
Data Review: BE
AECOM

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Table T2
Summary of Observations in Soil

Location	Borehole ID	Depth	Lithology	PID	Observations
Block 5	BH400	6.0-6.4	Gravelly Sandy Clay (FILL)	0.6	Mild tar odour.
		7.0-7.4	Gravelly Sand (FILL)	0.3	Some black staining. Mild tar odour.
		8.0-8.4	Gravelly Sand (FILL)	0.3	Mild tar odour.
		9.0-9.4	Gravelly Sand (FILL)	0.3	Very mild tar odour.
		14.0-14.2	Sandy CLAY	17.4	Minor tar staining (<5%). Tar odour.
		15.0-15.4	Clayey SAND	1.7	Tar odour.
		16.0-16.4	Clayey SAND	526.0	Black tar staining, >10% tar containing material. Very strong tar odour. Sheen noted.
		16.7	Weathered SANDSTONE	47.3	Tar odour. (No sample collected due to insufficient recovery)
	BH401	10.0-10.4	Clayey Sandy Gravel (FILL)	1.5	Very mild tar odour.
		11.0-11.4	Gravelly Sand (FILL)	1.5	Very mild tar odour.
		13.0-13.4	Sand (FILL)	1.4	Very mild tar odour.
		17.0-17.4	Clayey SAND	15.4	Very minor tar staining noted. Mild tar odour.
		19.2-19.4	Sandy CLAY	112.4	Black tar veins increasing with depth. Tar odour.
		20.0-20.15	Clayey SAND	5.0	Very mild tar odour.
	BH402	4.0-4.2	Silty Sand (FILL)	4.9	Mild hydrocarbon odour.
		9.0-9.3	Gravelly Silty Sand (FILL)	1.6	Very mild tar odour.
		13.0-13.2	Silty Sand (FILL)	3.6	Tar odour.
		14.0-14.5	Silty Sandy CLAY	106.5	Black tar staining (50%), >10% tar containing material. Tar odour. Sheen noted.
		15.0-15.5	Clayey Silty SAND	95.9	Black tar staining (30%), 10% tar containing material. Tar odour.
		16.0-16.3	Clayey Silty SAND	2297.0	Black tar staining, >10% tar containing material. Very strong tar odour. Sheen noted.
		17.0-17.4	Clayey Silty SAND	2047.0	>10% tar containing material. Very strong tar odour.
		18.1-18.3	Clayey Silty SAND	829.0	Black tar staining, >10% tar containing material. Very strong tar odour. Sheen noted.
		19.1-19.4	Silty CLAY	101.2	<10% tar containing material. Strong tar odour. Sheen noted.
	BH403	3.0-3.4	Gravelly Sand (FILL)	0.0	Mild tar odour.
		4.0-4.4	Gravelly Sand (FILL)	1.9	Black staining noted. Mild tar odour.
		5.0-5.4	Sand (FILL)	0.7	Mild tar odour.
		6.0-6.4	Sandy Gravel (FILL)	0.6	Mild tar odour.
		8.0-8.4	Silty CLAY	8.2	Mild tar odour.
		9.0-9.4	Sandy CLAY	125.4	Black and olive green staining, >10% tar containing material (tar veins and globules). Tar odour.
		10.0-10.4	Sandy CLAY	256.0	>10% Tar containing material (tar veins and globules) increasing with depth. Strong tar odour.
		11.0-11.4	Sandy CLAY	239.0	>10% Tar containing material (tar veins and globules), increasing with depth. Very strong tar odour.
		12.0-12.4	Sandy CLAY	1239.0	>30% Tar containing material (tar veins and globules), increasing with depth. Very strong tar odour.
		13.0-13.4	Clayey SAND/Sandy CLAY	438.0	Black and grey staining, >20% tar containing material. Very strong tar odour.
		14.0-14.4	Sandy CLAY	422.0	Black tar staining, >20% tar containing material (tar veins and globules). Strong tar odour.
		15.0-15.4	Sandy CLAY	509.0	Black tar staining, tar veins and globules noted. Strong tar odour.
		16.0-16.4	Silty Sandy CLAY	1120.0	>20% Tar containing material (tar veins and globules). Strong tar odour.
		17.0-17.3	Weathered SANDSTONE	440.0	Fine tar veins. Tar odour.
Block 4	BH404	0.4-0.5	Gravelly Sand (FILL)	0.5	Mild tar odour.
		3.0-3.4	Gravel (FILL)	-	Metallic dark grey slag observed. No odours or staining noted.
		4.0-4.4	Gravel/Sand (FILL)	0.1	Slag noted in fill. No odours or staining noted.
		6.0-6.4	Gravelly Sand (FILL)	0.2	Slag noted in fill. No odours or staining noted.
		7.0-7.4	Clayey Sandy Gravel (FILL)	0.4	Tar odour and sheen noted.
		12.0-12.4	Sand (FILL)	0.2	Hydrogen sulphide odour.
		14.0-14.4	Sandy Silty CLAY	0.9	Tar staining and tar odour.
		15.0-15.4	Silty CLAY	20.1	<10% Tar containing material. Tar odour.
	BH405	13.0-13.2	SAND	197.7	Strong tar odour.
		14.0-14.4	Clayey Silty SAND	467.2.	Black tar staining, <10% tar containing material. Tar odour.
	BH406	4.0-4.2	Silty Sandy Gravel (FILL)	0.8	Mild hydrogen sulphide odour.
		14.0-14.4	Silty Clay (FILL)	24.4	Band of tar noted (21cm). Tar odour.
		15.0-15.4	Silty CLAY	946.0	20% Tar containing material. Very strong tar odour.
		16.0-16.5	Silty SAND	3010.0	30% Tar containing material. Very strong tar odour. Sheen noted.
	BH407	13.0-13.2	Silty CLAY	0.5	Mild tar odour.
		14.0-14.5	Silty Clayey SAND	4.0	Tar odour.
		15.1-15.45	Silty Clayey SAND	10.1	Tar odour.
		16.3-16.5	Silty Clayey SAND	33.2	Tar odour.
		17.4-17.6	SAND	20.1	Tar odour.
		18.0-18.3	SAND	238.8	Hydrocarbon odour.
	BH408	8.0-8.3	Silty Sandy Clay (FILL)	29.1	Black tar staining, 20% tar containing material. Strong hydrocarbon/tar odour.
		9.0-9.4	Silty Clayey SAND	549.7	Black tar staining, 30% tar containing material. Strong tar odour. Sheen noted.
	BH409	3.7-4.0	Silty Clay (FILL)	10.2	Mild hydrocarbon odour.
		4.1-4.3	SAND	2.1	Hydrogen sulphide odour.
		5.0-5.3	SAND	107.2	Hydrocarbon odour.
		6.0-6.4	Silty Sandy CLAY	23.8	Tar odour.
		7.0-7.3	Silty Sandy CLAY	228.5	Tar and napthalene odour noted.
Block 4 and 5 Public Domain	BH410	17.0-17.5	Silty CLAY	0.7	Hydrocarbon odour and minor black staining.
	BH411	No obvious contamination noted during drilling and soil sampling.			
ORWS Public Domain	BH412	3.0-3.1	Silty Sand (FILL)	0	Tar odour.
		4.0-4.1	Sandstone (FILL)	-	Tar odour.
		6.0-6.1	Silty Clay (FILL)	0.5	Tar odour.
		21.0-21.2	SAND	0	Minor black staining. No odour noted.
	BH413	1.1-1.3	Gravelly Silty Clay (FILL)	0	Slight tar odour.
		3.0	Silty Sandy Gravel (FILL)	0	Slight hydrocarbon odour. (No sample collected due to insufficient recovery)
		4.0-4.2	Sandstone (FILL)	0	Tar odour.
		5.0-5.15	Sandstone (FILL)	0	Slight tar odour.
		6.0-6.15	Sandstone (FILL)	0	Slight tar odour.
		7.0	FILL	0	Slight tar odour. (No sample collected due to insufficient recovery)
		8.0-8.1	Silty Sand (FILL)	0	Slight tar odour.
		9.0-9.2	FILL	0	Slight hydrocarbon odour.
		13.0	FILL	-	Black and red slag fragments (1cm). No odours or staining noted. (Insufficient recovery to sample)
		14.0	FILL	-	Slag fragments in recovery. No odours or staining noted.
		15.0-15.5	Silty CLAY	1.1	Slight tar odour noted.
		16.0-16.2	Silty Sandy CLAY	0.4	Slight tar odour noted.
		16.2-16.4	Weathered SANDSTONE	0.4	Slight tar odour noted.

AECOM

Table T3
Soil Analytical Results
VMP and RBZ within Block 4 and 5

Location_Code	BH400	BH400	BH400	BH400	BH400	BH400	BH400	BH400	BH401	BH401	BH401	BH401	BH401	BH401	BH401	BH401	BH401	BH401	BH402	BH402
Sample_Depth	4-4.4	6-6.4	9-9.4	12-12.4	13.2-13.4	14-14.2	15-15.4	16-16.4	3-3.4	5-5.4	9-9.4	10-10.4	11-11.4	13-13.4	14-14.2	14-17.4	19.2-19.4	20-20.15	4-4.2	9-9.3
Field_ID	BH400_4-4.4	BH400_6.0-6.4	BH400_9.0-9.4	BH400_12.0-12.2	BH400_13.2-13.4	BH400_14.0-14.2	BH400_15-15.4	BH400_16.0-16.2	BH401_3.0-3.4	BH401_5.0-5.4	BH401_9.0-9.4	BH401_10-10.4	BH401_11-11.4	BH401_13-13.4	BH401_14-14.2	BH401_14-17.4	BH401_19.2-19.4	BH401_20-20.15	BH402_4.0-4.2	BH402_9.0-9.3
Sampled_Date	11/02/2011	11/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	10/02/2011	10/02/2011	10/02/2011	10/02/2011	10/02/2011	10/02/2011	10/02/2011	10/02/2011	11/02/2011	11/02/2011	9/02/2011	9/02/2011
SampleCode	ES1103100017	ES1103100017	ES1103100020	ES1103100023	ES1103100024	ES1103100025	ES1104964001	ES1103100027	ES1103042001	ES1103042002	ES1103042026	ES1104964002	ES1103042022	ES1103042003	ES1103042004	ES1103042005	ES1103042006	ES1104964003	ES1102973009	ES1102973010
Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal

ChemName	Units	EQL	SAC Residential	SAC Commercial/I	Criteria Source																	
						ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN
Lead																						
Lead	mg/kg	2	1200	**1500**	NSW DEC (2006)		234	86	226	10	<5		6	230	462			59	216	1490	8	7			**1500**
Metals																						
Arsenic	mg/kg	1	400	**500**	NSW DEC (2006)		5	<5	<5	8	<5		10	<5	6			<5	11	30	<5	<5			16
Cadmium	mg/kg	0.1	80	**100**	NSW DEC (2006)		2	<1	<1	<1	<1		<1	<1	<1			<1	<1	1	<1	<1			3
Chromium	mg/kg	1	400	**500**	NSW DEC (2006)		7	6	4	13	9		20	8	33			10	11	62	4	14			28
Copper	mg/kg	2	4000	**5000**	NSW DEC (2006)		14	164	13	<5	<5		<5	18	9			18	48	199	<5	<5			716
Mercury	mg/kg	0.05	60	**75**	NSW DEC (2006)		3.2	0.1	0.3	0.2	<0.1		<0.1	0.7	0.2			<0.1	0.7	6.9	<0.1	<0.1			4.1
Nickel	mg/kg	1	2400	**3000**	NSW DEC (2006)		3	10	5	<2	<2		<2	4	4			8	8	16	<2	<2			19
Zinc	mg/kg	5	28000	**35000**	NSW DEC (2006)		163	122	98	9	<5		<5	143	184			29	145	813	<5	<5			3780
TPH																						
TPH C15-C36	mg/kg						<200	570	<200	<200	<200		6410	<200	250			<200	240	2900	<200	1180			860
TPH C10 - C14	mg/kg	50					<50	<50	<50	<50	<50	<50	3000	<50	<50		<50	<50	<50	<50	<50	470	<50		<50
TPH C15-C28	mg/kg	100					<100	370	<100	<100	<100		5600	<100	130			<100	140	1720	<100	970			650
TPH C29-C36	mg/kg	100					<100	200	<100	<100	<100		810	<100	120			<100	<100	1180	<100	210			210
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)		<10	<10	<10	<10	<10	<10	**331**	<10	<10		<10	<10	<10	<10	<10	22	<10		<10
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)		<50	570	<50	<50	<50	<50	**9410**	<50	250		<50	<50	140	**2900**	<50	**1650**	<50		860
TPH C10 - C40 (Sum of total)	mg/kg	50																							
TPH C6-C10	mg/kg	10																							
BTEX																						
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)		0.3	<0.2	<0.2	<0.2	<0.2	<0.2	**40.3**	<0.2	<0.2		<0.2	<0.2	<0.2	<0.2	0.2	**1.4**	<0.2		<0.2
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	11.2	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5		<0.5
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	99.4	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	5.9	<0.5		<0.5
Xylene (m & p)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	78.2	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	7.2	<0.5		<0.5
Xylene (o)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	37.9	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	2.9	<0.5		<0.5
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)		<1	<1	<1	<1	<1	<1	**116.1**	<1	<1		<1	<1	<1	<1	<1	10.1	<1		<1
PAH/Phenols																						
2,4-dimethylphenol	mg/kg	0.5																							
2-methylnaphthalene	mg/kg	0.5									<0.5						<0.5						<0.5		
2-methylphenol	mg/kg	0.5																							
2-nitrophenol	mg/kg	0.5																							
3-&4-methylphenol	mg/kg	1																							
3-methylcholanthrene	mg/kg	10,000																							
3-Methylphenol	mg/kg	10,000																							
4-chloro-3-methylphenol	mg/kg	0.5																							
4-methylphenol	mg/kg	10,000																							
4-nitrophenol	mg/kg	10,000																							
2-(acetylamino) fluorene	mg/kg	100,000																							
Benzo(e)pyrene	mg/kg	10,000																							
Coronene	mg/kg	10,000																							
Dibenzofuran	mg/kg	0.5									<0.5						<0.5						<0.5		
Hexachlorophene	mg/kg	10,000																							
Perylene	mg/kg	10,000																							
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5		26.2	<0.5	<0.5			<0.5	0.6	0.8	<0.5	5			<0.5
Acenaphthylene	mg/kg	0.5					<0.5	0.6	<0.5	<0.5	1.3		215	<0.5	<0.5			<0.5	0.7	5.4	<0.5	30.9			0.6
Anthracene	mg/kg	0.5					<0.5	0.8	1.2	<0.5	1.2		78.4	<0.5	0.8			1.2	1.8	5.1	<0.5	19.5			1.1
Benz(a)anthracene	mg/kg	0.5					<0.5	3.2	2.3	<0.5	0.8		46.1	<0.5	1.3			1.8	3.1	14.6	<0.5	12.9			2.7
Benzo(a) pyrene	mg/kg	0.5	4	**5**	NSW DEC (2006)		<0.5	2.5	1.9	<0.5	<0.5		**26**	<0.5	1.2			1.6	2.8	**13.5**	<0.5	**8.5**			2.3
Benzo(b)&(k)fluoranthene	mg/kg	1																							
Benzo(b)fluoranthene	mg/kg	0.5					<0.5	3.2	2.4	<0.5	0.6		26.7	<0.5	1.6			1.8	3.7	16.7	<0.5	10			2.6
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	1.3	1	<0.5	<0.5		7.6	<0.5	0.6			1.2	1.5	5.8	<0.5	2.8			1.5
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	1.2	0.8	<0.5	<0.5		8	<0.5	0.5			0.7	1.3	7.6	<0.5	3.5			1.2
Chrysene	mg/kg	0.5					<0.5	2.5	1.9	<0.5	0.6		35.3	<0.5	1.1			1.5	2.5	11	<0.5	9.8			2.1
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5		2.2	<0.5	<0.5			<0.5	<0.5	1.3	<0.5	0.7			<0.5
Fluoranthene	mg/kg	0.5					0.8	10.3	5.4	0.9	2		111	<0.5	3.2			4.7	7.5	27.1	<0.5	28.4			4.6
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	1.3		156	<0.5	<0.5			0.6	1	1.3	<0.5	26			<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	1	0.8	<0.5	<0.5		6.8	<0.5	<0.5			0.9	1.2	5.2	<0.5	2.6			1.2
Naphthalene	mg/kg	0.5					6.1	<0.5	<0.5	<0.5	6		734	<0.5	<0.5			0.8	<0.5	1.3	<0.5	120			<0.5
Phenanthrene	mg/kg	0.5					0.7	1.4	3.4	0.5	3.8		363	<0.5	2.5			3.6	6.3	9.5	<0.5	61.3			3.4
Phenol	mg/kg	0.5	34000	**42500**	NSW DEC (2006)																				
Pyrene	mg/kg	0.5					0.8	9.4	5.3	0.9	1.8		150	<0.5	3			4.4	7.1	30.2	<0.5	28.5			4.4
CPAH (ESDAT)	mg/kg						<4	15.4	11.6	<4	4.5		158.7	<4	7.3			10	16.6	75.7	<4	50.8			14.1
PAH (ESDAT TOTAL)	mg/kg		80	**100**	NSW DEC (2006)		14.4	39.4	28.9	8.8	22.4		**1992.3**	<8	18.8			26.3	42.1	**156.4**	<8	**370.4**			29.7
PAH																									
7,12-dimethylbenz(a)anthracene	mg/kg	10,000																							
Halogenated Phenols																									
2,3,4,6-tetrachlorophenol	mg/kg	10,000																							
2,4,5-trichlorophenol	mg/kg	0.5																							
2,4,6-trichlorophenol	mg/kg	0.5																							
2,4-dichlorophenol	mg/kg	0.5																							
2,6-dichlorophenol	mg/kg	0.5																							
2-chlorophenol	mg/kg	0.5																							
Pentachlorophenol	mg/kg	2																							
MAH																									
Styrene	mg/kg	0.5									<0.5						<0.5						<0.5		
Inorganics																									
Ammonia as N	mg/kg	1									<20						<20						<20		
Cyanide Total	mg/kg	1	2000	**2500**	NSW DEC (2006)						<1						<1						<1		
Asbestos																									
Asbestos Detected						ND								ND		Yes								ND	
Asbestos Type						NA								NA		Ch*								NA	

Notes
SAC - Soil investigation criteria
NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)
NSW EPA (1994) Sensative land Use Criteria
mg/kg = milligrams per kilogram
LOR = Limit of Reporting
# denotes sum of concentrations not calculable as all <LOR
< denotes result less than LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)
ND - Not detected
NA - Not applicable
Ch = chrysotile asbestos
* one small fibre bundle
** several small fibre bundles

AECOM

Table T3
Soil Analytical Results
VMP and RBZ within Block 4 and 5

					Location_Code	BH402	BH402	BH402	BH402	BH402	BH402	BH403	BH403	BH403	BH403	BH403	BH403	BH403	BH403	BH403	BH404	BH404	BH404	BH404
					Sample_Depth	11-11.2	14-14.5	15-15.5	16-16.3	17-17.4	19.1-19.4	2-2.4	4-4.4	8-8.4	8-8.4	10-10.4	12-12.4	12-12.4	15-15.4	16-16.4	17-17.3	0.4-0.5	4-4.4	7-7.4	12-12.4
					Field_ID	BH402_11.0-11.2	BH402_14.0-14.5	BH402_15-15.5	BH402_16-16.3	BH402_17.0-17.4	BH402_19.1-19.4	BH403_2.0-2.4	BH403_4.0-4.4	BH403_8.0-8.4	BH403_8.0-8.4	BH403_10-10.4	BH403_12-12.4	BH403_12-12.4	BH403_15-15.4	BH403_16-16.4	BH403_17-17.3	BH404_0.4-0.5	BH404_4.0-4.4	BH404_7.0-7.4	BH404_12-12.4
					Sampled_Date	9/02/2011	9/02/2011	9/02/2011	10/02/2011	10/02/2011	10/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	8/02/2011	8/02/2011	8/02/2011	8/02/2011
					SampleCode	ES1102973011	ES1102973012	ES1104964004	ES1104964005	ES1102973013	ES1102973015	ES1102973017	ES1102973001	ES1102973002	ES1105851002	ES1104964006	ES1102973003	ES1105851003	ES1104964007	ES1102973004	ES1102973005	ES1102875001	ES1102875002	ES1102875003	ES1102875004
					Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
ChemName	Units	EQL	SAC Residential	SAC Commercial/I	Criteria Source	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN	ORWN
Lead																								
Lead	mg/kg	2	1200	**1500**	NSW DEC (2006)	86	9			8	31	31	182	289			8			11	10	179	89	78	92
Metals																								
Arsenic	mg/kg	1	400	**500**	NSW DEC (2006)	<5	<5			<5	<5	<5	<5	16			<5			<5	<5	<5	<5	<5	5
Cadmium	mg/kg	0.1	80	**100**	NSW DEC (2006)	<1	<1			<1	<1	<1	<1	<1			<1			<1	<1	<1	<1	<1	<1
Chromium	mg/kg	1	400	**500**	NSW DEC (2006)	9	10			7	8	17	30	42			7			18	11	12	6	13	7
Copper	mg/kg	2	4000	**5000**	NSW DEC (2006)	64	<5			<5	<5	32	40	156			<5			<5	<5	30	10	124	78
Mercury	mg/kg	0.05	60	**75**	NSW DEC (2006)	0.2	<0.1			<0.1	<0.1	0.1	<0.1	8.3			<0.1			<0.1	<0.1	0.2	0.2	<0.1	0.7
Nickel	mg/kg	1	2400	**3000**	NSW DEC (2006)	5	2			2	<2	12	39	20			3			3	<2	25	<2	15	6
Zinc	mg/kg	5	28000	**35000**	NSW DEC (2006)	99	12			7	8	31	129	404			10			8	<5	109	43	44	119
TPH																								
TPH C15-C36	mg/kg					<200	2220			6330	350	<200	3100	12,470			14,660			12,640	4270	490	380	7060	<200
TPH C10 - C14	mg/kg	50				<50	690	740	150	3060	180	<50	220	1300		12,300	7080		9340	5540	1800	<50	<50	650	<50
TPH C15-C28	mg/kg	100				<100	1560			4860	250	<100	1340	8870			11,200			9740	3290	280	230	5240	<100
TPH C29-C36	mg/kg	100				<100	660			1470	<100	<100	1760	3600			3460			2900	980	210	150	1820	<100
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)	<10	**66**	**67**	35	**470**	15	<10	<10	31		**930**	**651**		**95**	**434**	13	<10	<10	<10	<10
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)	<50	**2910**	740	150	**9390**	430	<50	**3320**	**13770**		**12,300**	**21700**		**9340**	**18180**	**6070**	490	380	**7710**	<50
TPH C10 - C40 (Sum of total)	mg/kg	50																							
TPH C6-C10	mg/kg	10																							
BTEX																								
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)	<0.2	**6.2**	**3.7**	0.8	**63.4**	**2.9**	<0.2	<0.2	**4.2**		**83.7**	**124**		**7**	**60**	**1.5**	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)	<0.5	1.5	2	1	9	<0.5	<0.5	<0.5	4.3		20.6	10.2		2.4	8.7	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)	<0.5	15.7	8	6.4	127	3.3	<0.5	<0.5	5		**202**	**145**		29.8	117	2.9	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	mg/kg	0.5				<0.5	20.4	19	10	128	2.6	<0.5	<0.5	6.6		318	131		38.4	116	3.3	<0.5	<0.5	<0.5	<0.5
Xylene (o)	mg/kg	0.5				<0.5	7.4	10	4.9	46.1	1	<0.5	<0.5	3.6		93.3	48.2		11.6	41.3	1.1	<0.5	<0.5	<0.5	<0.5
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)	<1	**27.8**	**29**	14.9	**174.1**	3.6	<1	<1	10.2		**411.3**	**179.2**		**50**	**157.3**	4.4	<1	<1	<1	<1
PAH/Phenols																								
2,4-dimethylphenol	mg/kg	0.5													1.34			380						
2-methylnaphthalene	mg/kg	0.5						54.4	4.5							528			324					
2-methylphenol	mg/kg	0.5													1.55			503						
2-nitrophenol	mg/kg	0.5													<0.02			<0.25						
3-&4-methylphenol	mg/kg	1																						
3-methylcholanthrene	mg/kg	10,000																						
3-Methylphenol	mg/kg	10,000													2.00			670						
4-chloro-3-methylphenol	mg/kg	0.5													<0.02			<0.25						
4-methylphenol	mg/kg	10,000													1.37			449						
4-nitrophenol	mg/kg	10,000													<0.02			<0.25						
2-(acetylamino) fluorene	mg/kg	100,000																						
Benzo(e)pyrene	mg/kg	10,000																						
Coronene	mg/kg	10,000																						
Dibenzofuran	mg/kg	0.5						23.1	2.3							222			130					
Hexachlorophene	mg/kg	10,000													<0.02									
Perylene	mg/kg	10,000																						
Acenaphthene	mg/kg	0.5				<0.5	4.3			27.7	<4	<0.5	6	37.4			31.4			31.9	12	<0.5	<0.5	47.6	<0.5
Acenaphthylene	mg/kg	0.5				<0.5	28.4			220	6.2	<0.5	<4	48.2			214			200	57	3	1.6	<4	<0.5
Anthracene	mg/kg	0.5				<0.5	24.8			158	4.4	0.8	<4	98			157			170	58.6	3.7	2.5	93.3	<0.5
Benz(a)anthracene	mg/kg	0.5				<0.5	16.7			93.3	<4	1.5	<4	112			120			115	39.7	6.4	3.5	75.2	<0.5
Benzo(a) pyrene	mg/kg	0.5	4	**5**	NSW DEC (2006)	<0.5	**11**			**69.6**	<4	1	<4	**70.5**			**60.9**			**68.4**	**27.2**	**6.2**	3	**52.7**	<0.5
Benzo(b)&(k)fluoranthene	mg/kg	1																						
Benzo(b)fluoranthene	mg/kg	0.5				<0.5	10.5			65.2	<4	1	<4	84.9			87.6			93	30.6	7	3.5	53.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	4.6			30.4	<4	0.6	<4	27.5			26.6			25.5	9.7	3.2	1.5	26	<0.5
Benzo(k)fluoranthene	mg/kg	0.5				<0.5	4.3			23	<4	<0.5	<4	34.4			40			34.2	13.6	2.5	1.2	28.4	<0.5
Chrysene	mg/kg	0.5				<0.5	11.9			73.8	<4	1.3	<4	77.6			91.2			86.4	29.1	5.1	2.5	68.6	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<4			7.4	<4	<0.5	<4	7.3			6.2			6.8	<4	0.8	<0.5	5.8	<0.5
Fluoranthene	mg/kg	0.5				0.9	43.1			278	7.7	3.2	4.9	227			253			280	114	17.4	10	212	0.9
Fluorene	mg/kg	0.5				<0.5	28.5			169	5.1	<0.5	<4	95			251			192	80.9	1.5	1.1	62.4	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	<4			24.8	<4	<0.5	<4	24.4			22.1			22.6	8.9	2.9	1	20.9	<0.5
Naphthalene	mg/kg	0.5				<0.5	168			957	27.6	<0.5	23.7	146			1160			941	441	1.4	<0.5	127	<0.5
Phenanthrene	mg/kg	0.5				0.5	69.7			417	12.7	3	7.8	267			480			420	160	8	6.6	323	<0.5
Phenol	mg/kg	0.5	34000	**42500**	NSW DEC (2006)										2.00			616						
Pyrene	mg/kg	0.5				0.9	38.1			251	6.8	3.1	<4	186			214			248	92.4	17	9.5	219	0.9
CPAH (ESDAT)	mg/kg					<4	67			387.5	<32	6.9	<32	438.6			454.6			451.9	162.8	34.1	16.7	331.1	<4
PAH (ESDAT TOTAL)	mg/kg		80	**100**	NSW DEC (2006)	8.8	**471.9**			**2865.2**	**106.5**	19	90.4	**1543.2**			**3215**			**2934.8**	**1178.7**	86.6	49	**1419.4**	8.8
PAH																								
7,12-dimethylbenz(a)anthracene	mg/kg	10,000																						
Halogenated Phenols																								
2,3,4,6-tetrachlorophenol	mg/kg	10,000													<0.02			<0.25						
2,4,5-trichlorophenol	mg/kg	0.5													<0.02			<0.25						
2,4,6-trichlorophenol	mg/kg	0.5													<0.02			<0.25						
2,4-dichlorophenol	mg/kg	0.5													<0.02			<0.25						
2,6-dichlorophenol	mg/kg	0.5													<0.02			<0.25						
2-chlorophenol	mg/kg	0.5													<0.02			<0.25						
Pentachlorophenol	mg/kg	2													<0.02			<0.25						
MAH																								
Styrene	mg/kg	0.5						<0.5	0.8							112			17					
Inorganics																								
Ammonia as N	mg/kg	1						<20	<20							<20			<20					
Cyanide Total	mg/kg	1	2000	**2500**	NSW DEC (2006)			<1	<1							<1			<1					
Asbestos																								
Asbestos Detected													ND								ND			
Asbestos Type													NA								NA			

Notes
SAC - Soil investigation criteria
NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)
NSW EPA (1994) Sensative land Use Criteria
mg/kg = milligrams per kilogram
LOR = Limit of Reporting
# denotes sum of concentrations not calculable as all <LOR
< denotes result less than LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)
ND - Not detected
NA - Not applicable
Ch = chrysotile asbestos
* one small fibre bundle
** several small fibre bundles

Data Entry: KM
Data Review: BE
AECOM

AECOM

Table T3
Soil Analytical Results
VMP and RBZ within Block 4 and 5

ChemName	Units	EQL	SAC Residential	SAC Commercial/I	Criteria Source	BH404 14-14.4	BH404 15-15.4	BH405 4-4.3	BH405 7-7.3	BH405 7-7.3	BH405 12-12.2	BH405 13-13.2	BH405 14-14.4	BH405 14-14.4	BH406 4-4.2	BH406 7-7.2	BH406 10-10.3	BH406 14-14.4	BH406 15-15.4	BH406 16-16.5	BH406 16-16.5	BH408 2-2.4	BH408 2-2.4	BH408 8-8.3	BH408 9-9.4
Location_Code						BH404	BH404	BH405	BH405	BH405	BH405	BH405	BH405	BH405	BH406	BH406	BH406	BH406	BH406	BH406	BH406	BH408	BH408	BH408	BH408
Sample_Depth						14-14.4	15-15.4	4-4.3	7-7.3	7-7.3	12-12.2	13-13.2	14-14.4	14-14.4	4-4.2	7-7.2	10-10.3	14-14.4	15-15.4	16-16.5	16-16.5	2-2.4	2-2.4	8-8.3	9-9.4
Field_ID						BH404_14-14.4	BH404_15-15.4	BH405_4.0-4.3	BH405_7.0-7.3	BH405_7.0-7.3	BH405_12.0-12.2	BH405_13.0-13.2	BH405_14.0-14.4	BH405_14.0-14.4	BH406_4.0-4.2	BH406_7.0-7.2	BH406_10.0-10.3	BH406_14.0-14.4	BH406_15.0-15.2	BH406_16.0-16.5	BH406_16.0-16.5	BH408_2.0-2.4	BH408_2.0-2.4	BH408_8.0-8.3	BH408_9.0-9.4
Sampled_Date						8/02/2011	8/02/2011	10/02/2011	10/02/2011	10/02/2011	11/02/2011	11/02/2011	11/02/2011	11/02/2011	8/02/2011	8/02/2011	8/02/2011	8/02/2011	8/02/2011	9/02/2011	9/02/2011	14/02/2011	14/02/2011	15/02/2011	15/02/2011
SampleCode						ES1102875005	ES1102875006	ES1103042007	ES1103042008	ES1105851004	ES1103042010	ES1103042011	ES1103042012	ES1105851005	ES1102875010	ES1102875011	ES1102875012	ES1102875013	ES1102875014	ES1102875015	ES1105851001	ES1103336009	ES1105851008	ES1103336012	ES1103336013
Sample_Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Lead																									
Lead	mg/kg	2	1200	**1500**	NSW DEC (2006)	804	61	74	30			10	20		161	<5	27	250	7	7		10		5	5
Metals																									
Arsenic	mg/kg	1	400	**500**	NSW DEC (2006)	28	<5	<5	<5			<5	<5		7	<5	<5	11	<5	10		<5		<5	6
Cadmium	mg/kg	0.1	80	**100**	NSW DEC (2006)	2	<1	<1	<1			<1	<1		<1	<1	<1	<1	<1	<1		<1		<1	<1
Chromium	mg/kg	1	400	**500**	NSW DEC (2006)	53	10	7	11			<2	4		20	55	5	20	5	9		8		22	20
Copper	mg/kg	2	4000	**5000**	NSW DEC (2006)	228	<5	41	<5			<5	<5		51	94	55	163	<5	<5		36		<5	<5
Mercury	mg/kg	0.05	60	**75**	NSW DEC (2006)	5	<0.1	<0.1	<0.1			<0.1	<0.1		0.1	<0.1	<0.1	1.4	<0.1	<0.1		<0.1		<0.1	<0.1
Nickel	mg/kg	1	2400	**3000**	NSW DEC (2006)	18	<2	4	5			<2	<2		7	32	3	13	<2	<2		8		3	<2
Zinc	mg/kg	5	28000	**35000**	NSW DEC (2006)	665	<5	52	33			10	<5		143	38	29	214	<5	<5		30		<5	<5
TPH																									
TPH C15-C36	mg/kg					2060	<200	1020	<200			2320	9030		290	240	250	1320	3490	3900		450		450	860
TPH C10 - C14	mg/kg	50				<50	130	<50	<50			510	3390		<50	<50	<50	90	1340	1940		<50		100	360
TPH C15-C28	mg/kg	100				1280	<100	400	<100			1760	7020		110	140	150	920	2720	3000		190		350	710
TPH C29-C36	mg/kg	100				780	<100	620	<100			560	2010		180	<100	<100	400	770	900		260		<100	150
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)	**125**	<10	<10	<10			<10	**156**		<10	<10	<10	30	**190**	**861**		<10		<10	24
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)	**2060**	130	**1020**	<50			**2830**	**12400**		290	140	150	**1410**	**4830**	**5840**		450		450	**1220**
TPH C10 - C40 (Sum of total)	mg/kg	50																							
TPH C6-C10	mg/kg	10																							
BTEX																									
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)	**11.5**	**1.2**	<0.2	<0.2			0.7	**5.9**		<0.2	<0.2	<0.2	**3.8**	**15.1**	**85**		<0.2		0.6	**2.1**
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)	14.5	<0.5	<0.5	<0.5			0.6	4		<0.5	<0.5	<0.5	2.6	3.2	10.9		<0.5		0.7	4.6
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)	6.6	1.3	<0.5	<0.5			0.6	33		<0.5	<0.5	<0.5	1.6	31	**140**		<0.5		<0.5	<0.5
Xylene (m & p)	mg/kg	0.5				26.5	1	<0.5	<0.5			3	57.2		<0.5	<0.5	<0.5	4.4	36.9	126		<0.5		0.7	5.1
Xylene (o)	mg/kg	0.5				8.6	<0.5	<0.5	<0.5			1.3	19.4		<0.5	<0.5	<0.5	2.3	13.1	45.8		<0.5		0.6	3.8
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)	**35.1**	1.5	<1	<1			4.3	**76.6**		<1	<1	<1	6.7	**50**	**171.8**		<1		1.3	8.9
PAH/Phenols																									
2,4-dimethylphenol	mg/kg	0.5								<0.1				4.9							326		0.03		
2-methylnaphthalene	mg/kg	0.5																							
2-methylphenol	mg/kg	0.5								<0.1				1.5							218		0.02		
2-nitrophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
3-&4-methylphenol	mg/kg	1																							
3-methylcholanthrene	mg/kg	10,000																							
3-Methylphenol	mg/kg	10,000								<0.1				0.9							250		0.02		
4-chloro-3-methylphenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
4-methylphenol	mg/kg	10,000								<0.1				0.5							175		0.02		
4-nitrophenol	mg/kg	10,000								<0.1				<0.02							<0.25		<0.1		
2-(acetylamino) fluorene	mg/kg	100,000																							
Benzo(e)pyrene	mg/kg	10,000																							
Coronene	mg/kg	10,000																							
Dibenzofuran	mg/kg	0.5																							
Hexachlorophene	mg/kg	10,000								<0.1				<0.02							<0.25				
Perylene	mg/kg	10,000																							
Acenaphthene	mg/kg	0.5				10.6	<0.5	<0.5	<0.5			11.2	44.9		<0.5	<0.5	0.9	31.3	10	34.3		<0.5		1.8	4.2
Acenaphthylene	mg/kg	0.5				11.6	<0.5	0.9	<0.5			45.2	221		<0.5	<0.5	<0.5	33.5	65.3	231		2.2		6.1	22.9
Anthracene	mg/kg	0.5				13.9	<0.5	1.2	<0.5			40.9	182		0.6	<0.5	1	68.2	50.3	162		3.5		6.2	12.5
Benz(a)anthracene	mg/kg	0.5				21.9	<0.5	5	<0.5			30.2	130		1.2	1.1	1.3	77.5	39.8	114		6.2		2.6	9.7
Benzo(a) pyrene	mg/kg	0.5	4	**5**	NSW DEC (2006)	**11.6**	<0.5	**5.9**	<0.5			**21.6**	**86.2**		1.7	0.9	1.1	**50.8**	**24.2**	**78.1**		**6.3**		1.3	**5.6**
Benzo(b)&(k)fluoranthene	mg/kg	1																							
Benzo(b)fluoranthene	mg/kg	0.5				20	<0.5	8	<0.5			25.7	96.3		2.1	0.9	1.1	49	24.5	92		7.1		1.1	4.6
Benzo(g,h,i)perylene	mg/kg	0.5				5.2	<0.5	2.6	<0.5			7.5	49.1		0.9	<0.5	0.5	19.1	9.5	29.4		4.5		0.6	2.6
Benzo(k)fluoranthene	mg/kg	0.5				9	<0.5	2.4	<0.5			14.3	44.5		0.7	<0.5	<0.5	22.9	12.2	26.5		3.1		<0.5	2.3
Chrysene	mg/kg	0.5				15.7	<0.5	5	<0.5			23.6	93		0.9	0.9	1.1	55.4	28.6	93.7		5.2		1.9	7.6
Dibenz(a,h)anthracene	mg/kg	0.5				1.4	<0.5	<0.5	<0.5			2	10.3		<0.5	<0.5	<0.5	5.1	<4	7.5		0.7		<0.5	0.6
Fluoranthene	mg/kg	0.5				52.5	0.6	6.8	<0.5			72.9	301		2.7	2.6	3.4	200	94.8	323		12.6		4.3	14.5
Fluorene	mg/kg	0.5				15.6	0.6	<0.5	<0.5			46.5	236		<0.5	<0.5	0.6	57.2	58	220		<0.5		7	16.6
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				4.6	<0.5	2.2	<0.5			7.6	42		0.7	<0.5	<0.5	17.9	8.4	26.6		3.6		<0.5	2
Naphthalene	mg/kg	0.5				88	7.6	<0.5	<0.5			208	1040		<0.5	<0.5	<0.5	76.7	401	1170		<0.5		13	89.8
Phenanthrene	mg/kg	0.5				38.8	0.9	1.4	<0.5			130	470		1.5	1	3.1	200	153	529		6.6		9.4	38.8
Phenol	mg/kg	0.5	34000	**42500**	NSW DEC (2006)					<0.1				<0.02							21		<0.1		
Pyrene	mg/kg	0.5				51	0.5	17.1	<0.5			63	250		7.2	3	3.3	168	80.4	266		12.9		6.9	18.3
CPAH (ESDAT)	mg/kg					89.4	<4	31.6	<4			132.5	551.4		8.7	5.8	6.6	297.7	151.2	467.8		36.7		9	35
PAH (ESDAT TOTAL)	mg/kg		80	**100**	NSW EPA (1994)	**371.4**	15.7	60.5	<8			**750.2**	**3296.3**		22.7	14.9	19.9	**1132.6**	**1064**	**3403.1**		76		63.7	**252.6**
PAH																									
7,12-dimethylbenz(a)anthracene	mg/kg	10,000																							
Halogenated Phenols																									
2,3,4,6-tetrachlorophenol	mg/kg	10,000								<0.1				<0.02							<0.25		<0.1		
2,4,5-trichlorophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
2,4,6-trichlorophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
2,4-dichlorophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
2,6-dichlorophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
2-chlorophenol	mg/kg	0.5								<0.1				<0.02							<0.25		<0.1		
Pentachlorophenol	mg/kg	2								<0.1				<0.02							<0.25		<0.1		
MAH																									
Styrene	mg/kg	0.5																							
Inorganics																									
Ammonia as N	mg/kg	1																							
Cyanide Total	mg/kg	1	2000	**2500**	NSW DEC (2006)																				
Asbestos																									
Asbestos Detected											Yes					ND						ND			
Asbestos Type											Ch**					NA						NA			

Notes
SAC - Soil investigation criteria
NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)
NSW EPA (1994) Sensative land Use Criteria
mg/kg = milligrams per kilogram
LOR = Limit of Reporting
# denotes sum of concentrations not calculable as all <LOR
< denotes result less than LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)
ND - Not detected
NA - Not applicable
Ch = chrysotile asbestos
* one small fibre bundle
** several small fibre bundles

Data Entry: KM
Data Review: BE
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Table T3
Soil Analytical Results
VMP and RBZ within Block 4 and 5

Location_Code						BH408	BH409_1.0-1.3	BH409	BH409	BH409	BH409	BH409	BH409	BH406	BH406	BH402	BH402	BH405	BH408	BH404	BH403
Sample_Depth						9-9.4	1.0-1.3	3.7-4	3.7-4	5-5.3	6-6.4	7-7.3	7-7.3	15-15.4	15-15.4	17-17.4	17-17.4	14-14.4	9-9.4	14-14.4	8-8.4
Field_ID						BH408_9.0-9.4	BH409_1.0-1.3	BH409_3.7-4.0	BH409_3.7-4.0	BH409_5.0-5.3	BH409_6.0-6.4	BH409_7.0-7.3	BH409_7.0-7.3	QC602	QC603	QC606	QC607	QC609	QC613	QC653	QC656
Sampled_Date						15/02/2011	13/02/2011	14/02/2011	14/02/2011	14/02/2011	15/02/2011	15/02/2011	15/02/2011	8/02/2011	8/02/2011	10/02/2011	10/02/2011	11/02/2011	15/02/2011	8/02/2011	9/02/2011
SampleCode						ES1105851009		ES1103336002	ES1105851006	ES1103336004	ES1104964009	ES1103336006	ES1105851007	ES1102875016	S11-FE30884	ES1102973014	A11-FE30900	ES1103042013	ES1103336014	ES1102875007	ES1102973005
Sample_Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Interlab_D	Field_D	Interlab_D	Field_D	Field_D	Field_D	Field_D
ChemName	**Units**	**EQL**	**SAC Residential**	**SAC Commercial/I**	**Criteria Source**	VMP Area	VMP Area	VMP Area	VMP Area	VMP Area	VMP Area	VMP Area	VMP Area	ORWN	ORWN	ORWN	ORWN	VMP Area	VMP Area	ORWN	ORWN
Lead																					
Lead	mg/kg	2	1200	**1500**	NSW DEC (2006)			6		<5		6		6	6.4	7	6.1	20	6	334	379
Metals																					
Arsenic	mg/kg	1	400	**500**	NSW DEC (2006)			<5		22		<5		<5	<2	<5	<2	<5	8	21	21
Cadmium	mg/kg	0.1	80	**100**	NSW DEC (2006)			<1		<1		<1		<1	<0.5	<1	<0.5	<1	<1	1	1
Chromium	mg/kg	1	400	**500**	NSW DEC (2006)			15		7		14		5	5.5	13	6	9	20	29	34
Copper	mg/kg	2	4000	**5000**	NSW DEC (2006)			<5		<5		<5		<5	<5	5	<5	<5	<5	132	184
Mercury	mg/kg	0.05	60	**75**	NSW DEC (2006)			<0.1		<0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2.6	7.2
Nickel	mg/kg	1	2400	**3000**	NSW DEC (2006)			<2		3		<2		<2	<5	3	<5	<2	<2	12	18
Zinc	mg/kg	5	28000	**35000**	NSW DEC (2006)			8		7		<5		<5	5.6	11	12	7	<5	508	467
TPH																					
TPH C15-C36	mg/kg							<200		280		<200		2660		6400	4600	7650	360	1880	8400
TPH C10 - C14	mg/kg	50						<50		150	<50	<50		850	940	2350	2000	3020	110	<50	320
TPH C15-C28	mg/kg	100						<100		180		<100		2020	2500	4900	3600	5950	260	1160	5480
TPH C29-C36	mg/kg	100						<100		<100		<100		640	960	1500	1000	1700	<100	720	2920
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)			<10		12	<10	**106**		**505**	**73**	**221**	**310**	10	<10	**87**	15
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)			<50		330 - 430	<50	<50		**3510**	**4400**	**8750**	**6600**	**10670**	370	**18880**	**8720**
TPH C10 - C40 (Sum of total)	mg/kg	50																			
TPH C6-C10	mg/kg	10																			
BTEX																					
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)			<0.2		**1.8**	0.3	**2.8**		**35.8**	**11**	**32**	**40**	0.6	0.5	**9.8**	**3.5**
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)			<0.5		3.5	<0.5	3.5		6.8	2.4	4.1	<5	<0.5	1	9.8	2.4
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)			<0.5		<0.5	<0.5	22.3		68.6	24	57.9	87	2.7	<0.5	7.1	0.9
Xylene (m & p)	mg/kg	0.5						<0.5		1.1	<0.5	17.8		76.6	26	60	80	4	1.2	19.3	1.9
Xylene (o)	mg/kg	0.5						<0.5		1.8	<0.5	8.9		28.8	9.7	21.5	36	1.4	1	5.8	1.2
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)			<1		2.9	<1	**26.7**		**105.4**	**36**	**81.5**	**116**	5.4	2.2	**25.1**	3.1
PAH/Phenols																					
2,4-dimethylphenol	mg/kg	0.5				<0.05			<0.01				0.04								
2-methylnaphthalene	mg/kg	0.5									<0.5										
2-methylphenol	mg/kg	0.5				<0.05			<0.01				0.09								
2-nitrophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
3-&4-methylphenol	mg/kg	1																			
3-methylcholanthrene	mg/kg	10,000																			
3-Methylphenol	mg/kg	10,000				<0.05			<0.01				0.03								
4-chloro-3-methylphenol	mg/kg	0.5				<0.05			<0.01				<0.01								
4-methylphenol	mg/kg	10,000				<0.05			<0.01				0.06								
4-nitrophenol	mg/kg	10,000				<0.05			<0.01				<0.01								
2-(acetylamino) fluorene	mg/kg	100,000																			
Benzo(e)pyrene	mg/kg	10,000																			
Coronene	mg/kg	10,000																			
Dibenzofuran	mg/kg	0.5									<0.5										
Hexachlorophene	mg/kg	10,000				<0.05			<0.01				<0.01								
Perylene	mg/kg	10,000																			
Acenaphthene	mg/kg	0.5						<0.5		5.6		<0.5		6.2	11	14.3	13	43.2	1.1	7.8	6.6
Acenaphthylene	mg/kg	0.5						<0.5		2.8		0.7		33.2	50	115	110	213	6.6	9.2	20.2
Anthracene	mg/kg	0.5						<0.5		1.9		<0.5		32.3	52	78.8	84	168	3.9	11.8	19.8
Benz(a)anthracene	mg/kg	0.5						<0.5		0.6		<0.5		25.5	43	53.9	61	129	2.5	16.6	46.8
Benzo(a) pyrene	mg/kg	0.5	4	**5**	NSW DEC (2006)			<0.5		<0.5		<0.5		**15.8**	**33**	**36.6**	**55**	**84.8**	1.4	**10.2**	**36.8**
Benzo(b)&(k)fluoranthene	mg/kg	1													46		77				
Benzo(b)fluoranthene	mg/kg	0.5						<0.5		<0.5		<0.5		15		34.7		94.3	1.1	15.6	41.7
Benzo(g,h,i)perylene	mg/kg	0.5						<0.5		<0.5		<0.5		6.1	15	15.8	23	47.7	0.6	4.5	18.6
Benzo(k)fluoranthene	mg/kg	0.5						<0.5		<0.5		<0.5		4.6		17		45.1	0.5	4.5	18
Chrysene	mg/kg	0.5						<0.5		<0.5		<0.5		16.8	31	40.4	48	90.2	1.9	11.2	34.3
Dibenz(a,h)anthracene	mg/kg	0.5						<0.5		<0.5		<0.5		<4	3.9	<4	2.4	10.4	<0.5	1.2	4.1
Fluoranthene	mg/kg	0.5						<0.5		1.2		<0.5		61.2	110	145	160	290	4.2	44.7	96.9
Fluorene	mg/kg	0.5						<0.5		2.2		<0.5		30.3	62	89.2	120	208	4.8	9.3	8.7
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5						<0.5		<0.5		<0.5		5.2	14	12.8	19	41.6	<0.5	4.2	14.6
Naphthalene	mg/kg	0.5						<0.5		33.8		2.8		236	440	457	1300	1010	23.8	60.6	8.3
Phenanthrene	mg/kg	0.5						<0.5		6.8		1.1		89.6	160	220	310	456	11.7	29	49.9
Phenol	mg/kg	0.5	34000	**42500**	NSW DEC (2006)	<0.05			0.01				<0.01								
Pyrene	mg/kg	0.5						<0.5		1.8		0.6		48.9	83	131	140	239	5.2	42.6	114
CPAH (ESDAT)	mg/kg							<4		4.1		<4		93		215.2	208.4	543.1	9	68	214.9
PAH (ESDAT TOTAL)	mg/kg		80	**100**	NSW DEC (2006)			<8		60.2		11.2		**630.7**		**1465.5**	**2445.4**	**3170.3**	70.3	**283**	**539.3**
PAH																					
7,12-dimethylbenz(a)anthracene	mg/kg	10,000																			
Halogenated Phenols																					
2,3,4,6-tetrachlorophenol	mg/kg	10,000				<0.05			<0.01				<0.01								
2,4,5-trichlorophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
2,4,6-trichlorophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
2,4-dichlorophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
2,6-dichlorophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
2-chlorophenol	mg/kg	0.5				<0.05			<0.01				<0.01								
Pentachlorophenol	mg/kg	2				<0.05			<0.01				<0.01								
MAH																					
Styrene	mg/kg	0.5									<0.5										
Inorganics																					
Ammonia as N	mg/kg	1									<20										
Cyanide Total	mg/kg	1	2000	**2500**	NSW DEC (2006)						<1										
Asbestos																					
Asbestos Detected							ND														
Asbestos Type							NA														

Notes
SAC - Soil investigation criteria
NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)
NSW EPA (1994) Sensative land Use Criteria
mg/kg = milligrams per kilogram
LOR = Limit of Reporting
# denotes sum of concentrations not calculable as all <LOR
< denotes result less than LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)
ND - Not detected
NA - Not applicable
Ch = chrysotile asbestos
* one small fibre bundle
** several small fibre bundles

Data Entry: KM
Data Review: BE
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Table T4
Soil Analytical Results
Public Domain and Proposed Southern Cove

ChemName	output unit	LOR	SAC Public Domain	SAC Residential	Criteria Source													
Location_Code						BH407	BH407	BH407	BH407	BH407	BH407	BH407	BH407	BH410	BH410	BH410	BH410	BH410
Sample_Depth						1.0-1.3	8-8.1	12-12.18	14-14.5	15.1-15.45	16.3-16.5	17.4-17.6	18-18.3	2-2.2	7-7.2	17-17.5	23-23.2	26-26.2
Field_ID						BH407_1.0-1.3	BH407_8.0-8.1	BH407_12.0-12.18	BH407_14.0-14.5	BH407_15.1-15.45	BH407_16.3-16.5	BH407_17.4-17.6	BH407_18.0-18.3	BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
Sampled_Date						13/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	14/02/2011	10/05/2011	10/05/2011	11/05/2011	11/05/2011	12/05/2011
SampleCode						ES1103100002	ES1103100003	ES1103100005	ES1103100007	ES1104964008	ES1103100009	ES1103100010	ES1103100011	ES1105160003	ES1105160006	ES1105160010	ES1105160016	ES1105160019
Sample_Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Monitoring_Zone						Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Proposed Southern Cove	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5
Metals																		
Arsenic	mg/kg	1	200	**400**	NSW DEC (2006)		<5	<5	<5		9	<5	<5	<5	<5	12	<5	<5
Cadmium	mg/kg	0.1	40	**80**	NSW DEC (2006)		<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1
Chromium	mg/kg	1	200	**100**	NSW DEC (2006)		12	10	6		10	2	11	10	8	19	4	3
Copper	mg/kg	2	2000	**4000**	NSW DEC (2006)		<5	<5	<5		<5	<5	<5	80	51	48	<5	5
Lead	mg/kg	2	600	**1200**	NSW DEC (2006)		11	6	6		5	<5	6	269	308	419	11	<5
Mercury	mg/kg	0.05	30	**60**	NSW DEC (2006)		<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	2	6.2	1.1	<0.1	<0.1
Nickel	mg/kg	1	600	**2400**	NSW DEC (2006)		4	7	2		<2	<2	<2	13	7	10	<2	<2
Zinc	mg/kg	5	14000	**28000**	NSW DEC (2006)		24	15	<5		<5	<5	<5	303	301	362	23	<5
TPH																		
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)		<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C15-C36	mg/kg						<200	<200	<200		<200	<200	<200					
TPH C10 - C14	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28	mg/kg	100					<100	<100	<100		<100	<100	<100	<100	840	1160	<100	<100
TPH C29-C36	mg/kg	100					<100	<100	<100		<100	<100	<100	<100	290	660	<100	<100
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)		<50	<50	<50	<50	<50	<50	<50	<50	**1130**	**1820**	<50	<50
BTEX																		
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)		<0.2	<0.2	0.2	<0.2	0.4	0.4	**1.2**	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (o)	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)		<1	<1	<1	<1	<1	<1	<1	<0.5	<0.5	<0.5	<0.5	<0.5
PAH/Phenols																		
2,4-dimethylphenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2-methylnaphthalene	mg/kg	0.5								<0.5								
2-methylphenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	mg/kg	1												<1	<1	<1	<1	<1
3-methylcholanthrene	mg/kg	10,000																
3-Methylphenol	mg/kg	10,000																
4-chloro-3-methylphenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
4-methylphenol	mg/kg	10,000																
4-nitrophenol	mg/kg	10,000																
2-(acetylamino) fluorene	mg/kg	100,000																
Coronene	mg/kg	10,000																
Dibenzofuran	mg/kg	0.5								<0.5				<0.5	<0.5	0.5	<0.5	<0.5
Hexachlorophene	mg/kg	10,000																
Acenaphthene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	4.1	<0.5	<0.5
Acenaphthylene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	5.2	<0.5	<0.5
Anthracene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	9.7	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	9.6	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	2	**4**	NSW DEC (2006)		<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	**7.7**	<0.5	<0.5
Benzo(b)&(k)fluoranthene	mg/kg	1																
Benzo(b)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	8.9	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	3.9	<0.5	<0.5
Benzo(e)pyrene	mg/kg	10,000																
Benzo(k)fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	4.5	<0.5	<0.5
Chrysene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	7.9	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5
Fluoranthene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	23	<0.5	<0.5
Fluorene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	4.8	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	3.3	<0.5	<0.5
Naphthalene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<1 - 2.8	<0.5	<0.5
Perylene	mg/kg	10,000																
PAHs (Sum of total)	mg/kg	1																
Phenanthrene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	24.4	<0.5	<0.5
Phenol	mg/kg	0.5	17000	**34000**	NSW DEC (2006)									<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5					<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	21.3	<0.5	<0.5
CPAH (ESDAT)	mg/kg						<4	<4	<4		<4	<4	<4					
PAH (ESDAT TOTAL)	mg/kg		40	**80**	NSW DEC (2006)		<8	<8	<8		<8	<8	<8	<8	<8	60.7	<8	<8
PAH																		
7,12-dimethylbenz(a)anthracene	mg/kg	10,000																
Halogenated Phenols																		
2,3,4,6-tetrachlorophenol	mg/kg	10,000																
2,4,5-trichlorophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	mg/kg	0.5												<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2												<2	<2	<2	<2	<2
Inorganics																		
Ammonia as N	mg/kg	1								<20								
Cyanide Total	mg/kg	1	1000	**2000**	NSW DEC (2006)					<1				<1	<1	2	<1	<1
MAH																		
Styrene	mg/kg	0.5								<0.5								
Asbestos																		
Asbestos Detected						ND												
Asbestos Type						NA												

Notes

NSW DEC (2006) - SIL_2 (Residential) and SIL_3 (Public Domain)

NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)

NSW EPA (1994) Sensative land Use Criteria

mg/kg = milligrams per kilogram

LOR = Limit of Reporting

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

NSW EPA (1994) - Sensative Land Use Criteria

ND - Not detected

NA - Not applicable

< denotes result less than LOR

Data Entry: KM
Data Review: BE
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Table T4
Soil Analytical Results
Public Domain and Proposed Southern Cove

ChemName	output unit	LOR	SAC Public Domain	SAC Residential	Criteria Source	BH410 32-32.2	BH411 10-10.1	BH411 15-15.1	BH411 18-18.1	BH411 19-19.1	BH411 2-2.1	BH411 23-23.1	BH411 26-26.1	BH411 3.1-3.2	BH411 4-4.1	BH411 8-8.1	BH412 11-11.2	BH412 19-19.3
Location_Code						BH410	BH411	BH411	BH411	BH411	BH411	BH411	BH411	BH411	BH411	BH411	BH412	BH412
Sample_Depth						32-32.2	10-10.1	15-15.1	18-18.1	19-19.1	2-2.1	23-23.1	26-26.1	3.1-3.2	4-4.1	8-8.1	11-11.2	19-19.3
Field_ID						BH410 32.0-32.2	BH411 10.0-10.1	BH411 15.0-15.1	BH411 18.0-18.1	BH411 19.0-19.1	BH411 2.0-2.1	BH411 23.0-23.1	BH411 26.0-26.1	BH411 3.1-3.2	BH411 4.0-4.1	BH411 8.0-8.1	BH412 11.0-11.2	BH412 19.0-19.3
Sampled_Date						12/05/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	6/04/2011	7/04/2011
SampleCode						ES1105516025	ES1108140011	ES1108140012	ES1108140014	ES1108140015	ES1108140005	ES1108140019	ES1108140022	ES1108140006	ES1108140007	ES1108140010	ES1105719012	ES1105719015
Sample_Type						Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Monitoring_Zone						Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	ORWS - Public Domain	ORWS - Public Domain
Metals																		
Arsenic	mg/kg	1	200	**400**	NSW DEC (2006)	<5		7	24		<5		<5		<5	5	<5	<5
Cadmium	mg/kg	0.1	40	**80**	NSW DEC (2006)	<1		<1	<1		<1		<1		<1	<1	<1	<1
Chromium	mg/kg	1	200	**100**	NSW DEC (2006)	23		10	40		11		2		5	23	3	17
Copper	mg/kg	2	2000	**4000**	NSW DEC (2006)	<5		47	118		14		6		160	32	<5	8
Lead	mg/kg	2	600	**1200**	NSW DEC (2006)	6		257	366		135		<5		70	150	22	19
Mercury	mg/kg	0.05	30	**60**	NSW DEC (2006)	<0.1		0.9	3.4		0.4		<0.1		0.2	0.2	<0.1	<0.1
Nickel	mg/kg	1	600	**2400**	NSW DEC (2006)	5		8	12		24		<2		27	18	<2	2
Zinc	mg/kg	5	14000	**28000**	NSW DEC (2006)	7		198	446		83		<5		402	222	9	<5
TPH																		
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)	22		<10	<10		<10		<10		<10	<10	<10	<10
TPH C15-C36	mg/kg						<200	1310	1950	<200	<200	<200	<200	<200	<200	<200	<200	<200
TPH C10 - C14	mg/kg	50				<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28	mg/kg	100				<100	<100	930	1130	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH C29-C36	mg/kg	100				<100	<100	380	820	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)	<50	<50	**1310**	**1950**	<50	<50	<50	<50	<50	<50	<50	<50	<50
BTEX																		
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)	<0.2		<0.2	<0.2		<0.2		<0.2		<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)	<0.5		<0.5	<0.5		<0.5		<0.5		<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)	16.4		<0.5	<0.5		<0.5		<0.5		<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	mg/kg	0.5				<0.5		<0.5	<0.5		<0.5		<0.5		<0.5	<0.5	<0.5	<0.5
Xylene (o)	mg/kg	0.5				<0.5		<0.5	<0.5		<0.5		<0.5		<0.5	<0.5	<0.5	<0.5
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)	<0.5		<0.5	<0.5		<0.5		<0.5		<0.5	<0.5	<0.5	<0.5
PAH/Phenols																		
2,4-dimethylphenol	mg/kg	0.5				<0.5	0.01			<0.01		<0.01		<0.01				
2-methylnaphthalene	mg/kg	0.5					0.08			<0.01		<0.01		0.01				
2-methylphenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
2-nitrophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
3-&4-methylphenol	mg/kg	1				<1												
3-methylcholanthrene	mg/kg	10,000					<0.01			<0.01		<0.01		<0.01				
3-Methylphenol	mg/kg	10,000					0.02			<0.01		<0.01		<0.01				
4-chloro-3-methylphenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
4-methylphenol	mg/kg	10,000					0.01			<0.01		<0.01		<0.01				
4-nitrophenol	mg/kg	10,000					<0.01			<0.01		<0.01		<0.01				
2-(acetylamino) fluorene	mg/kg	100,000					<0.1			<0.1		<0.1		<0.01				
Coronene	mg/kg	10,000					0.02			<0.01		<0.01		0.02				
Dibenzofuran	mg/kg	0.5				<0.5	0											
Hexachlorophene	mg/kg	10,000					<0.01			<0.01		<0.01		<0.01				
Acenaphthene	mg/kg	0.5				<0.5	0.06	<0.5	0.5	<0.01	<0.5	<0.01	<0.5	0	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5				<0.5	0.34	<0.5	3.4	<0.01	<0.5	<0.01	<0.5	0.09	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5				<0.5	0.62	<0.5	3.3	<0.01	<0.5	<0.01	<0.5	0.12	0.6	0.6	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5				<0.5	0.97	<0.5	7.3	<0.01	0.7	<0.01	<0.5	0.46	1.1	0.7	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5	2	**4**	NSW DEC (2006)	<0.5	0.70	<0.5	**6.8**	<0.01	0.6	<0.01	<0.5	0.48	0.9	0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	mg/kg	1					0.00											
Benzo(b)fluoranthene	mg/kg	0.5				<0.5	0.62	<0.5	5.9	<0.01	0.6	<0.01	<0.5	0.44	1	0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	0.15	<0.5	2.7	<0.01	<0.5	<0.01	<0.5	0.14	<0.5	<0.5	<0.5	<0.5
Benzo(e)pyrene	mg/kg	10,000					0.4			<0.01		<0.01		0.28				
Benzo(k)fluoranthene	mg/kg	0.5				<0.5	0.44	<0.5	1.9	<0.01	<0.5	<0.01	<0.5	0.26	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5				<0.5	0.79	<0.5	5.6	<0.01	<0.5	<0.01	<0.5	0.42	0.8	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	0.09	<0.5	<0.5	<0.01	<0.5	<0.01	<0.5	0.06	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5				<0.5	2.11	1	17	<0.01	1.3	<0.01	<0.5	0.75	2.4	1.8	<0.5	<0.5
Fluorene	mg/kg	0.5				<0.5	0.35	<0.5	1.2	<0.01	<0.5	<0.01	<0.5	0.02	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	0.17	<0.5	2.2	<0.01	<0.5	<0.01	<0.5	0.13	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5				<0.5	0.06	<0.5	<1 - 1.2	<0.01	<0.5	<0.01	<0.5	0.03	<0.5	<0.5	<0.5	<0.5
Perylene	mg/kg	10,000					0.17			<0.01		<0.01		0.12				
PAHs (Sum of total)	mg/kg	1					0.00											
Phenanthrene	mg/kg	0.5				<0.5	2.18	<0.5	5.4	<0.01	0.7	<0.01	<0.5	0.42	1.3	2	<0.5	<0.5
Phenol	mg/kg	0.5	17000	**34000**	NSW DEC (2006)	<0.5	0.02			<0.01		<0.01		<0.01				
Pyrene	mg/kg	0.5				<0.5	1.90	0.9	17.7	0.01	1.2	<0.01	<0.5	0.79	2.3	1.7	<0.5	<0.5
CPAH (ESDAT)	mg/kg						3.93	<4	32.9	<0.08	4.4	<0.08	<4	2.39	5.8	4.2	<4	<4
PAH (ESDAT TOTAL)	mg/kg		40	**80**	NSW DEC (2006)	<8	11.55	8.9	**82.6**	0.16	10.1	<0.16	<8	4.62	14.4	12.3	<8	<8
PAH																		
7,12-dimethylbenz(a)anthracene	mg/kg	10,000					<0.01			<0.01		<0.01		<0.01				
Halogenated Phenols																		
2,3,4,6-tetrachlorophenol	mg/kg	10,000					<0.01			<0.01		<0.01		<0.01				
2,4,5-trichlorophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
2,4,6-trichlorophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
2,4-dichlorophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
2,6-dichlorophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
2-chlorophenol	mg/kg	0.5				<0.5	<0.01			<0.01		<0.01		<0.01				
Pentachlorophenol	mg/kg	2				<2	<0.01			<0.01		<0.01		<0.01				
Inorganics																		
Ammonia as N	mg/kg	1					<1			8		<1						
Cyanide Total	mg/kg	1	1000	**2000**	NSW DEC (2006)	<1												
MAH																		
Styrene	mg/kg	0.5																
Asbestos																		
Asbestos Detected																		
Asbestos Type																		

Notes

NSW DEC (2006) - SIL_2 (Residential) and SIL_3 (Public Domain)
NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)
NSW EPA (1994) Sensative land Use Criteria
mg/kg = milligrams per kilogram
LOR = Limit of Reporting
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

NSW EPA (1994) - Sensative Land Use Criteria
ND - Not detected
NA - Not applicable
< denotes result less than LOR

AECOM

Table T4
Soil Analytical Results
Public Domain and Proposed Southern Cove

					Location_Code	BH412	BH412	BH412	BH412	BH413	BH413	BH413	BH413	BH413	BH413
					Sample_Depth	22-22.2	3-3.1	4-4.1	8-8.1	1.1-1.3	4-4.2	6-6.15	9-9.2	15-15.5	16.4-16.6
					Field_ID	BH412_22.0-22.2	BH412_3.0-3.1	BH412_4.0-4.1	BH412_8.0-8.1	BH413_1.1-1.3	BH413_4.0-4.2	BH413_6.0-6.15	BH413_9.0-9.2	BH413_15.0-15.5	BH413_16.4-16.6
					Sampled_Date	8/04/2011	6/04/2011	6/04/2011	6/04/2011	1/04/2011	1/04/2011	1/04/2011	1/04/2011	5/04/2011	5/04/2011
					SampleCode	ES1107519021	ES1107519006	ES1107519007	ES1107519010	ES1107354001	ES1107354002	ES1107354003	ES1107354004	ES1107354005	ES1107354006
					Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
					Monitoring_Zone	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain	ORWS - Public Domain
ChemName	output unit	LOR	SAC Public Domain	SAC Residential	Criteria Source										
Metals															
Arsenic	mg/kg	1	200	**400**	NSW DEC (2006)	<5	<5	<5	<5	<5	<5	5	<5	8	<5
Cadmium	mg/kg	0.1	40	**80**	NSW DEC (2006)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	mg/kg	1	200	**100**	NSW DEC (2006)	8	6	6	12	10	7	13	8	19	2
Copper	mg/kg	2	2000	**4000**	NSW DEC (2006)	<5	31	<5	16	49	34	<5	29	71	<5
Lead	mg/kg	2	600	**1200**	NSW DEC (2006)	<5	283	31	102	485	219	14	111	429	16
Mercury	mg/kg	0.05	30	**60**	NSW DEC (2006)	<0.1	0.2	<0.1	0.2	0.3	3.7	0.2	<0.1	1	<0.1
Nickel	mg/kg	1	600	**2400**	NSW DEC (2006)	<2	4	3	<2	13	5	<2	4	8	<2
Zinc	mg/kg	5	14000	**28000**	NSW DEC (2006)	<5	536	52	109	195	181	7	48	310	<5
TPH															
TPH C6 - C9	mg/kg	10	65	**65**	NSW EPA (1994)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C15-C36	mg/kg					<200	<200	<200	<200	900	2510	<200	<200	1550	<200
TPH C10 - C14	mg/kg	50				<50	<50	<50	<50	<50	70	<50	<50	<50	<50
TPH C15-C28	mg/kg	100				<100	<100	<100	<100	520	1250	<100	<100	800	<100
TPH C29-C36	mg/kg	100				<100	<100	<100	<100	380	1260	<100	<100	750	<100
TPH+C10 - C36 (Sum of total)	mg/kg	50	1000	**1000**	NSW EPA (1994)	<50	<50	<50	<50	900	**2580**	<50	<50	**1550**	<50
BTEX															
Benzene	mg/kg	0.2	1	**1**	NSW EPA (1994)	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.5	50	**50**	NSW EPA (1994)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	0.5	130	**130**	NSW EPA (1994)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (o)	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene (ESDAT)	mg/kg	0.15	25	**25**	NSW EPA (1994)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAH/Phenols															
2,4-dimethylphenol	mg/kg	0.5													
2-methylnaphthalene	mg/kg	0.5													
2-methylphenol	mg/kg	0.5													
2-nitrophenol	mg/kg	0.5													
3-&4-methylphenol	mg/kg	1													
3-methylcholanthrene	mg/kg	10,000													
3-Methylphenol	mg/kg	10,000													
4-chloro-3-methylphenol	mg/kg	0.5													
4-methylphenol	mg/kg	10,000													
4-nitrophenol	mg/kg	10,000													
2-(acetylamino) fluorene	mg/kg	100,000													
Coronene	mg/kg	10,000													
Dibenzofuran	mg/kg	0.5													
Hexachlorophene	mg/kg	10,000													
Acenaphthene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.8	<0.5
Acenaphthylene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	1.3	1.1	<0.5	<0.5	1	<0.5
Anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	3.4	2.8	<0.5	<0.5	2.2	<0.5
Benz(a)anthracene	mg/kg	0.5				<0.5	0.7	<0.5	1.6	13.2	11.9	0.6	<0.5	7.4	<0.5
Benzo(a) pyrene	mg/kg	0.5	2	**4**	NSW DEC (2006)	<0.5	0.8	<0.5	1.6	**12.1**	**8.9**	0.6	0.5	**8**	<0.5
Benzo(b)&(k)fluoranthene	mg/kg	1													
Benzo(b)fluoranthene	mg/kg	0.5				<0.5	0.6	<0.5	1.6	14.6	9.6	0.7	0.6	9.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5				<0.5	<0.5	<0.5	0.9	4.9	2.7	<0.5	<0.5	3.2	<0.5
Benzo(e)pyrene	mg/kg	10,000													
Benzo(k)fluoranthene	mg/kg	0.5				<0.5	<0.5	<0.5	0.6	4.9	3.9	<0.5	<0.5	2.7	<0.5
Chrysene	mg/kg	0.5				<0.5	0.6	<0.5	1.3	12.4	8.7	<0.5	<0.5	7.1	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	1.5	0.8	<0.5	<0.5	0.9	<0.5
Fluoranthene	mg/kg	0.5				<0.5	1.4	0.5	3.4	25.3	17.8	1.1	0.8	14.5	<0.5
Fluorene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	1	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5				<0.5	<0.5	<0.5	0.7	4.6	2.6	<0.5	<0.5	3	<0.5
Naphthalene	mg/kg	0.5				<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1 - 0.5	<0.5
Perylene	mg/kg	10,000													
PAHs (Sum of total)	mg/kg	1													
Phenanthrene	mg/kg	0.5				<0.5	0.8	<0.5	1	12.8	9.9	<0.5	<0.5	6.2	<0.5
Phenol	mg/kg	0.5	17000	**34000**	NSW DEC (2006)										
Pyrene	mg/kg	0.5				<0.5	1.4	0.6	4	26.1	29.8	1.8	2	14.8	<0.5
CPAH (ESDAT)	mg/kg					<4	4.7	<4	8.8	68.2	49.1	4.4	4.1	41.8	<4
PAH (ESDAT TOTAL)	mg/kg		40	**80**	NSW DEC (2006)	<8	10.8	8.1	19.7	**138.6**	**112.6**	10.3	9.9	**82.8**	<8
PAH															
7,12-dimethylbenz(a)anthracene	mg/kg	10,000													
Halogenated Phenols															
2,3,4,6-tetrachlorophenol	mg/kg	10,000													
2,4,5-trichlorophenol	mg/kg	0.5													
2,4,6-trichlorophenol	mg/kg	0.5													
2,4-dichlorophenol	mg/kg	0.5													
2,6-dichlorophenol	mg/kg	0.5													
2-chlorophenol	mg/kg	0.5													
Pentachlorophenol	mg/kg	2													
Inorganics															
Ammonia as N	mg/kg	1													
Cyanide Total	mg/kg	1	1000	**2000**	NSW DEC (2006)										
MAH															
Styrene	mg/kg	0.5													
Asbestos															
Asbestos Detected															
Asbestos Type															

Notes

NSW DEC (2006) - SIL_2 (Residential) and SIL_3 (Public Domain)

NSW DEC (2006) - SIL_2 (Residential) and SIL_4 (Commercial/Industrial)

NSW EPA (1994) Sensative land Use Criteria

mg/kg = milligrams per kilogram

LOR = Limit of Reporting

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

NSW EPA (1994) - Sensative Land Use Criteria

ND - Not detected

NA - Not applicable

< denotes result less than LOR

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Table T5
Field Groundwater Quality Parameters

Monitoring Well	Date	Purge Method	Purge	Volume Purged (L)	Dissolved Oxygen (ppm)	Conductivity (µs/cm)	pH	Field Redox. (mV)	SHE Redox. (mV)	Temp. (^{0}C)
MW08 (ERM)	02/28/2011	Micropurge	Pre	0.5	0.57	32895	6.87	-234.5	-35.5	24.7
			Post	7.0	0.18	27061	7.24	-173.0	26.0	25.4
MW62 (AECOM)	02/24/2011	Micropurge	Pre	0.5	0.27	39694	8.33	-232.9	-33.9	26.0
			Post	3.5	0.01	37530	7.65	-303.2	-104.2	26.7
MW68 (AECOM)	02/24/2011	Micropurge	Pre	0.5	0.14	16016	6.64	-122.5	76.5	24.7
			Post	3.5	0.08	15862	6.82	-164.6	34.4	24.4
MW69 (AECOM)	02/25/2011	Foot valve	Pre	1.0	1.74	2263	7.97	-81.4	117.6	25.5
			Post	56.0	0.52	24148	7.07	-179.8	19.2	22.6
MW198 (ERM)	02/25/2011	Micropurge	Pre	1.0	0.25	3692	6.43	-106.3	92.7	22.2
			Post	5.0	0.11	1784	6.36	-98.7	100.3	22.6
MW200 (ERM)	02/28/2011	Micropurge	Pre	0.5	1.12	12055	6.30	-73.5	125.5	22.7
			Post	3.0	0.48	11853	6.16	-136.2	62.8	22.9
MW204S (ERM)	02/25/2011	Micropurge	Pre	0.5	1.23	742	6.34	-106.2	92.8	26.0
			Post	2.75	0.14	767	6.62	-137.3	61.7	25.5
MW209 (ERM)	02/28/2011	Micropurge	Pre	0.5	0.20	45535	7.01	-188.3	10.7	22.5
			Post	3.0	0.07	46762	6.95	-208.7	-9.7	22.6
MW210 (ERM)	02/24/2011	Micropurge	Pre	0.5	1.92	30036	6.65	-24.5	174.5	23.3
			Post	4.5	0.20	42091	6.12	-98.7	100.3	24.5
MW401 (AECOM)	02/24/2011	Micropurge	Pre	0.5	1.56	34881	6.61	-109.2	89.8	24.9
			Post	2.5	0.21	37816	6.56	-122.7	76.3	23.9
IT3S (AECOM)	02/25/2011	Bailer	Pre	1.0	2.67	43654	7.12	120.2	319.2	24.9
			Post	2.5	3.04	43265	7.12	90.0	289.0	24.8
IT3M (AECOM)	02/25/2011	Bailer and foot valve	Pre	1.0	1.99	14628	7.97	85.3	284.3	24.6
			Post	14.0	0.76	44015	7.10	-10.0	189.0	24.0
IT3D (AECOM)	02/25/2011	Foot valve	Pre	1.0	0.93	23542	7.40	-136.5	62.5	24.6
			Post	26.0	0.52	40944	7.33	-145.1	53.9	22.1
IT04S (AECOM)	05/19/2011	Foot valve	Pre	1.0	4.37	15520	7.14	29.7	228.7	22.8
			Post	5.0	0.21	44230	7.02	70.1	269.1	22.7
IT04M (AECOM)	05/19/2011	Foot valve	Pre	1.0	2.20	12819	6.29	-72.7	126.3	23.6
			Post	26.0	0.27	41998	6.92	-179.2	19.8	20.7
IT04D (AECOM)	05/19/2011	Foot valve	Pre	1.0	5.05	1043	8.34	45.3	244.3	21.8
			Post	45.0	0.73	33733	5.42	28.1	227.1	20.1
IT05S (AECOM)	05/19/2011	Foot valve	Pre	1.0	2.84	40360	7.05	-6.0	193.0	20.5
			Post	6.0	3.44	41211	7.08	27.8	226.8	21.3
IT05M (AECOM)	05/19/2011	Foot valve	Pre	1.0	2.97	21700	5.70	-59.3	139.7	19.9
			Post	20.0	4.58	39139	6.79	-5.4	193.6	18.5
IT05D (AECOM)	05/19/2011	Foot valve	Pre	1.0	4.06	12961	5.41	148.2	347.2	17.2
			Post	36.0	1.30	39808	4.12	121.1	320.1	19.1
IT06S (AECOM)	04/20/2011	Foot valve	Pre	1.0	0.86	38920	7.63	-118.0	81.0	21.6
			Post	5.0	0.85	41090	7.58	-141.7	57.3	22.3
IT06M (AECOM)	04/20/2011	Foot valve	Pre	1.0	5.61	3000	10.47	-91.9	107.1	21.2
			Post	16.0	0.77	43860	7.74	-129.3	69.7	20.8
IT06D (AECOM)	04/20/2011	Foot valve	Pre	1.0	2.42	11000	6.28	27.9	226.9	20.4
			Post	27.0	0.97	14000	5.05	105.1	304.1	19.8
IT07S (AECOM)	04/19/2011	Foot valve	Pre	1.0	3.51	46210	7.42	-0.6	198.4	25.4
			Post	5.0	2.85	45990	7.36	-10.7	188.3	24.5
IT07M (AECOM)	04/19/2011	Foot valve	Pre	1.0	1.38	15120	8.01	-117.9	81.1	25.0
			Post	12.0	0.50	46770	7.69	-129.1	69.9	23.6
IT07D (AECOM)	04/19/2011	Foot valve	Pre	1.0	1.62	16560	7.51	-73.3	125.7	25.3
			Post	24.0	0.72	45900	7.57	-165.3	33.7	21.6

Notes :
Pre: Pre-purge water quality parameter readings
Post: Post-purge water quality parameter readings
ERM: Monitoring wells installed by ERM
AECOM: Monitoring wells installed by AECOM
ppm parts per million
uS/cm - micro-siemens/cm
mV -millivolts
SHE - Standard Hydrogen Electrode (+199 to field ORP reading)

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Table T6
Groundwater Analytical Results

			Location_Code	BH405	BH405	BH405	BH410	BH410	BH410	BH410	BH410
			Well	IT3	IT3	IT3	IT04	IT04	IT04	IT04	IT04
			Field_ID	IT3S	IT3M	IT3D	IT04S	IT04S	IT04M	IT04M	IT04D
			Sampled_Date_Time	25/02/2011	25/02/2011	25/02/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011
			SDG	ES1104161	ES1104161	ES1104161	ES1110580	ES1110584	ES1110580	ES1110584	ES1110580
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			SampleCode	ES1104161003	ES1104161004	ES1104161005	ES1110580001	ES1110584001	ES1110580002	ES1110584002	ES1110580003
			Monitoring_Zone	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5
ChemName	**output unit**	**EQL**	**ANZECC (2000) Marine (95%)**								
Metals											
Aluminium (Filtered)	mg/L	0.005		<0.01	0.01	<0.01	<0.01		<0.01		<0.01
Antimony (Filtered)	mg/L	2E-04		0.0017	0.0021	0.0005	0.0012		<0.0005		<0.0005
Arsenic (Filtered)	µg/L	0.2		1.7	0.8	0.7	0.6		1.5		<0.5
Barium (Filtered)	mg/L	5E-04		0.096	0.1	0.714	0.063		0.111		0.114
Beryllium (Filtered)	µg/L	0.1		<0.1	<0.1	<0.1	<0.1		<0.1		<0.1
Cadmium (Filtered)	µg/L	0.05	5.5	0.9	0.4	<0.2	<0.2		<0.2		0.3
Chromium (Filtered)	µg/L	0.2	4.4	<0.5	<0.5	<0.5	<0.5		<0.5		<0.5
Chromium (hexavalent) (Filtered)	mg/L	0.01						<0.01		<0.01	
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274					<0.01		<0.01	
Cobalt (Filtered)	µg/L	0.1	1	0.8	0.3	0.4	0.7		0.7		45.5
Copper (Filtered)	µg/L	0.5	1.3	<1	<1	<1	30		<1		24
Manganese (Filtered)	mg/L	5E-04		0.072	0.0336	0.294	0.0338		0.182		4.52
Mercury (Filtered)	µg/L	0.1	0.1*	<0.1	<0.1	<0.1	<0.1		<0.1		<0.1
Nickel (Filtered)	µg/L	0.5	70	5.4	1.2	<0.5	9.1		1		34.3
Selenium (Filtered)	mg/L	2E-04		<0.002	<0.002	<0.002	<0.002		<0.002		<0.002
Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001	<0.0001	<0.0001	0.0003		0.0001		<0.0001
Vanadium (Filtered)	µg/L	0.2	100	1.9	0.9	0.9	1.2		0.8		<0.5
Zinc (Filtered)	mg/L	0.001	0.015	0.017	0.046	<0.005	0.018		<0.005		0.09
TPH											
TPH C15-C36	mg/L			0.65	<0.15	3.23	<0.15		<0.15		<0.15
TPH C10 - C14	µg/L	50		<50	<50	5590	<50		<50		<50
TPH C15-C28	µg/L	100		410	<100	2970	<100		<100		<100
TPH C29-C36	µg/L	50		240	<50	260	<50		<50		<50
TPH C6 - C9	µg/L	20		<20	<20	2120	<20		<20		<20
TPH+C10 - C36 (Sum of total)	µg/L	50		650	<50	8820	<50		<50		<50
BTEX											
Benzene	µg/L	1	700	<1	<1	595	<1		<1		7
Ethylbenzene	µg/L	1		<2	<2	51	<2		<2		<2
Toluene	µg/L	1		<5	<5	465	<5		<5		<5
Xylene (m & p)	µg/L	2		<2	<2	325	<2		<2		<2
Xylene (o)	µg/L	1		<2	<2	136	<2		<2		<2
Total Xylene (ESDAT)	µg/L	2		<4	<4	461	<2		<2		<2
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1					<0.1		<0.1		<0.1
2,4,5-trichlorophenol	µg/L	0.1		<1	<1	<10	<0.1		<0.1		<0.1
2,4,6-trichlorophenol	µg/L	0.1		<1	<1	<10	<0.1		<0.1		<0.1
2,4-dichlorophenol	µg/L	0.1		<1	<1	<10	<0.1		<0.1		<0.1
2,6-dichlorophenol	µg/L	0.1		<1	<1	<10	<0.1		<0.1		<0.1
2-chlorophenol	µg/L	0.05		<1	<1	<10	<0.05		<0.05		<0.05
Pentachlorophenol	µg/L	0.05	22	<2	<2	<20	<0.05		<0.05		<0.05
tetrachlorophenols	µg/L	30									
Herbicides											
Dinoseb	µg/L	100									
Inorganics											
Ammonia as N	mg/L	0.01						<0.1		1.24	
Cyanide (Free)	mg/L	0.004		<0.004	<0.004	<0.004	<0.004		<0.004		<0.004
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004	<0.004	<0.004	<0.004		0.006		<0.008
Cyanide (WAD)	mg/L	0.01									
Lead											
Lead (Filtered)	µg/L	0.1	4.4	0.8	2.4	0.2	0.8		<0.2		<0.2
MAH											
Styrene	µg/L	5						<5		<5	
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002	<0.002	<0.02	<0.00025		<0.00025		<0.00025
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5									
Total BTEX	mg/L	0.01									
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1					<0.1		<0.1		<0.1
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		<1	<1	360	<0.1		<0.1		18.8
2,4-dinitrophenol	mg/L	0.03									
2-methylnaphthalene	µg/L	0.1					<0.1		<0.1		<0.1
2-methylphenol	µg/L	0.1		<1	<1	159	<0.1		<0.1		5.4
2-nitrophenol	µg/L	0.1		<1	<1	<10	<0.1		<0.1		<0.1
3-&4-methylphenol	µg/L	2		<2	<2	123					
3-methylcholanthrene	µg/L	0.1					<0.1		<0.1		<0.1
3-Methylphenol	µg/L	0.1					<0.1		<0.1		1.5
4,6-Dinitro-2-methylphenol	µg/L	30									
4-chloro-3-methylphenol	µg/L	0.05		<1	<1	<10	<0.05		<0.05		<0.05
4-methylphenol	mg/L	1E-04					<0.0001		<0.0001		0.0003
4-nitrophenol	µg/L	0.1					<0.1		<0.1		<0.1
2-(acetylamino) fluorene	µg/L	0.1					<0.1		<0.1		<0.1
Benzo(e)pyrene	µg/L	0.1					<0.1		<0.1		<0.1
Coronene	µg/L	0.1					<0.1		<0.1		<0.1
Dibenzofuran	µg/L	2						<2		<2	
Hexachlorophene	µg/L	0.1					<0.1		<0.1		<0.1
Perylene	µg/L	0.1					<0.1		<0.1		<0.1
Acenaphthene	µg/L	0.01		<1	<1	25	<0.1		0.2		<0.1
Acenaphthylene	µg/L	0.01		<1	<1	158	<0.1		<0.1		<0.1
Anthracene	µg/L	0.01		<1	<1	25.7	<0.1		0.1		<0.1
Benz(a)anthracene	µg/L	0.01		2.2	<1	19.6	<0.1		<0.1		<0.1
Benzo(a) pyrene	µg/L	0.01		3.8	<0.5	12.8	<0.05		<0.05		<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05									
Benzo(b)fluoranthene	µg/L	0.1		4.8	<1	12.4	<0.1		<0.1		<0.1
Benzo(g,h,i)perylene	µg/L	0.01		3	<1	<10	<0.1		<0.1		<0.1
Benzo(k)fluoranthene	µg/L	0.1		2.5	<1	<10	<0.1		<0.1		<0.1
Chrysene	µg/L	0.01		1.4	<1	11.3	<0.1		<0.1		<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<1	<1	<10	<0.1		<0.1		<0.1
Fluoranthene	µg/L	0.01		1.9	<1	28.6	<0.1		0.3		<0.1
Fluorene	µg/L	0.01		<1	<1	75.9	<0.1		0.1		<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		2.2	<1	<10	<0.1		<0.1		<0.1
Naphthalene	µg/L	0.01	70	<1	<1	2560	<0.1		<5 - 0.2		<5 - 4.3
Phenanthrene	µg/L	0.01		<1	<1	77.7	<0.1		0.5		<0.1
Phenol	µg/L	0.1	400	<1	<1	<10	<0.1		<0.1		0.2
Pyrene	µg/L	0.01		4.5	1	41.8	<0.1		0.4		<0.1
CPAH (ESDAT)	µg/L			20.9	<7.5	96.1	<0.75		<0.75		<0.75
PAH (ESDAT TOTAL)	µg/L			33.3	15.5	3088.8	<1.55		2.65		5.75
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.001	<0.001	<0.01	<0.00005		<0.00005		<0.00005

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

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Table T6
Groundwater Analytical Results

			Location_Code	BH411	BH411	BH411	BH411	BH411	BH411	BH412	BH412
			Well	IT05	IT05	IT05	IT05	IT05	IT05	IT06	IT06
			Field_ID	IT05S	IT05S	IT05M	IT05M	IT05D	IT05D	IT06_SHALLOW	IT06_Shallow
			Sampled_Date_Time	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	20/04/2011	20/04/2011
			SDG	ES1110580	ES1110584	ES1110580	ES1110584	ES1110580	ES1110584	ES1108478	ES1108663
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			SampleCode	ES1110580004	ES1110584004	ES1110580005	ES1110584005	ES1110580006	ES1110584006	ES1108478004	ES1108663004
			Monitoring_Zone	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	ORWS	ORWS
ChemName	**output unit**	**EQL**	**ANZECC (2000) Marine (95%)**								
Metals											
Aluminium (Filtered)	mg/L	0.005		0.01		0.01		9.09		<0.01	
Antimony (Filtered)	mg/L	2E-04		0.001		<0.0005		<0.0005		<0.0005	
Arsenic (Filtered)	µg/L	0.2		1.4		1.7		14.7		1.1	
Barium (Filtered)	mg/L	5E-04		0.064		0.009		0.037		0.152	
Beryllium (Filtered)	µg/L	0.1		<0.1		<0.1		13.9		<0.1	
Cadmium (Filtered)	µg/L	0.05	5.5	0.3		<0.2		0.7		<0.2	
Chromium (Filtered)	µg/L	0.2	4.4	<0.5		<0.5		<0.5		<0.5	
Chromium (hexavalent) (Filtered)	mg/L	0.01			<0.01		<0.01		<0.01		
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274		<0.01		<0.01		<0.01		
Cobalt (Filtered)	µg/L	0.1	1	0.5		<0.2		145		1.5	
Copper (Filtered)	µg/L	0.5	1.3	<1		2		<1		<1	
Manganese (Filtered)	mg/L	5E-04		0.0126		0.0022		7.38		0.244	
Mercury (Filtered)	µg/L	0.1	0.1*	<0.1		<0.1		<0.1		<0.1	
Nickel (Filtered)	µg/L	0.5	70	1.3		<0.5		171		1.8	
Selenium (Filtered)	mg/L	2E-04		<0.002		<0.002		0.005		<0.002	
Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001		0.0002		0.0002		<0.0001	
Vanadium (Filtered)	µg/L	0.2	100	1.3		1.6		2		1.2	
Zinc (Filtered)	mg/L	0.001	0.015	0.036		0.014		0.456		<0.005	
TPH											
TPH C15-C36	mg/L			<0.15		<0.15		<0.15		0.94	
TPH C10 - C14	µg/L	50		<50		<50		120		<50	
TPH C15-C28	µg/L	100		<100		<100		<100		690	
TPH C29-C36	µg/L	50		<50		<50		<50		250	
TPH C6 - C9	µg/L	20		<20		<20		90		<20	
TPH+C10 - C36 (Sum of total)	µg/L	50		<50		<50		120		940	
BTEX											
Benzene	µg/L	1	700	<1		<1		34		<1	
Ethylbenzene	µg/L	1		<2		<2		<2		<2	
Toluene	µg/L	1		<5		<5		8		9	
Xylene (m & p)	µg/L	2		<2		<2		12		<2	
Xylene (o)	µg/L	1		<2		<2		5		<2	
Total Xylene (ESDAT)	µg/L	2		<2		<2		17		<2	
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.1		<0.1		<0.1			
2,4,5-trichlorophenol	µg/L	0.1		<0.1		<0.1		<0.1		<1	
2,4,6-trichlorophenol	µg/L	0.1		<0.1		<0.1		<0.1		<1	
2,4-dichlorophenol	µg/L	0.1		<0.1		<0.1		<0.1		<1	
2,6-dichlorophenol	µg/L	0.1		<0.1		<0.1		<0.1		<1	
2-chlorophenol	µg/L	0.05		<0.05		<0.05		<0.05		<1	
Pentachlorophenol	µg/L	0.05	22	<0.05		<0.05		<0.05		<2	
tetrachlorophenols	µg/L	30									
Herbicides											
Dinoseb	µg/L	100									
Inorganics											
Ammonia as N	mg/L	0.01			<0.1		<0.1		2.47		2.34
Cyanide (Free)	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
Cyanide (WAD)	mg/L	0.01									
Lead											
Lead (Filtered)	µg/L	0.1	4.4	0.5		0.6		8		0.2	
MAH											
Styrene	µg/L	5			<5		<5		<5		
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.00025		<0.00025		<0.00025		<0.002	
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5								9	
Total BTEX	mg/L	0.01									
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1		<0.1		<0.1			
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		<0.1		<0.1		12.8		<1	
2,4-dinitrophenol	mg/L	0.03									
2-methylnaphthalene	µg/L	0.1		<0.1		<0.1		1.3			<0.1
2-methylphenol	µg/L	0.1		<0.1		<0.1		2.1		<1	0.2
2-nitrophenol	µg/L	0.1		<0.1		<0.1		<0.1		<1	
3-&4-methylphenol	µg/L	2								<2	
3-methylcholanthrene	µg/L	0.1		<0.1		<0.1		<0.1			
3-Methylphenol	µg/L	0.1		<0.1		<0.1		<0.1			0.1
4,6-Dinitro-2-methylphenol	µg/L	30									
4-chloro-3-methylphenol	µg/L	0.05		<0.05		<0.05		<0.05		<1	
4-methylphenol	mg/L	1E-04		<0.0001		<0.0001		<0.0001			0.0002
4-nitrophenol	µg/L	0.1		<0.1		<0.1		<0.1			
2-(acetylamino) fluorene	µg/L	0.1		<0.1		<0.1		<0.1			
Benzo(e)pyrene	µg/L	0.1		<0.1		<0.1		<0.1			
Coronene	µg/L	0.1		<0.1		<0.1		<0.1			
Dibenzofuran	µg/L	2			<2		<2		<2		
Hexachlorophene	µg/L	0.1		<0.1		<0.1		<0.1			
Perylene	µg/L	0.1		<0.1		<0.1		<0.1			
Acenaphthene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Acenaphthylene	µg/L	0.01		<0.1		<0.1		0.1		<1	
Anthracene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Benz(a)anthracene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Benzo(a) pyrene	µg/L	0.01		<0.05		<0.05		<0.05		1.2	
Benzo(b)&(k)fluoranthene	µg/L	0.05									
Benzo(b)fluoranthene	µg/L	0.1		<0.1		<0.1		<0.1		1.3	
Benzo(g,h,i)perylene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Benzo(k)fluoranthene	µg/L	0.1		<0.1		<0.1		<0.1		<1	
Chrysene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Dibenz(a,h)anthracene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Fluoranthene	µg/L	0.01		<0.1		<0.1		<0.1		1.8	
Fluorene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1		<0.1		<0.1		<1	
Naphthalene	µg/L	0.01	70	<0.1		<0.1		64 - 80.2		<5 - 1	
Phenanthrene	µg/L	0.01		<0.1		<0.1		<0.1		1.2	
Phenol	µg/L	0.1	400	<0.1		<0.1		<0.1		<1	
Pyrene	µg/L	0.01		<0.1		<0.1		<0.1		2.5	
CPAH (ESDAT)	µg/L			<0.75		<0.75		<0.75		8.5	
PAH (ESDAT TOTAL)	µg/L			<1.55		<1.55		81.6499999999999		19	
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.00005		<0.00005		<0.00005		<0.001	

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

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Table T6
Groundwater Analytical Results

			Location_Code	BH412	BH412	BH412	BH412	BH413	BH413	BH413	BH413
			Well	IT06	IT06	IT06	IT06	IT07	IT07	IT07	IT07
			Field_ID	IT06_MID	IT06_Mid	IT06_DEEP	IT06_Deep	IT07_SHALLOW	IT07_Shallow	IT07_MID	IT07_Mid
			Sampled_Date_Time	20/04/2011	20/04/2011	20/04/2011	20/04/2011	19/04/2011	19/04/2011	19/04/2011	19/04/2011
			SDG	ES1108478	ES1108663	ES1108478	ES1108663	ES1108478	ES1108663	ES1108478	ES1108663
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			SampleCode	ES1108478005	ES1108663005	ES1108478006	ES1108663006	ES1108478001	ES1108663001	ES1108478002	ES1108663002
			Monitoring_Zone	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS
ChemName	**output unit**	**EQL**	**ANZECC (2000) Marine (95%)**								
Metals											
Aluminium (Filtered)	mg/L	0.005		0.01		1.59		0.01		0.02	
Antimony (Filtered)	mg/L	2E-04		0.0006		<0.0002		0.0026		0.0019	
Arsenic (Filtered)	µg/L	0.2		0.9		2.2		1.6		1.6	
Barium (Filtered)	mg/L	5E-04		0.05		0.0901		0.068		0.049	
Beryllium (Filtered)	µg/L	0.1		<0.1		1.6		<0.1		<0.1	
Cadmium (Filtered)	µg/L	0.05	5.5	<0.2		0.13		0.4		<0.2	
Chromium (Filtered)	µg/L	0.2	4.4	<0.5		0.3		<0.5		<0.5	
Chromium (hexavalent) (Filtered)	mg/L	0.01									
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274								
Cobalt (Filtered)	µg/L	0.1	1	0.6		17.5		14.1		2.4	
Copper (Filtered)	µg/L	0.5	1.3	<1		<0.5		4		<1	
Manganese (Filtered)	mg/L	5E-04		0.0438		2.05		0.0419		0.0465	
Mercury (Filtered)	µg/L	0.1	0.1*	<0.1		<0.1		<0.1		<0.1	
Nickel (Filtered)	µg/L	0.5	70	<0.5		27.3		9.3		2.2	
Selenium (Filtered)	mg/L	2E-04		<0.002		0.0008		<0.002		<0.002	
Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001		<0.0001		0.0001		0.0001	
Vanadium (Filtered)	µg/L	0.2	100	0.6		1.5		1		0.8	
Zinc (Filtered)	mg/L	0.001	0.015	0.007		0.167		0.027		0.01	
TPH											
TPH C15-C36	mg/L			0.76		<0.15		2.47		1.34	
TPH C10 - C14	µg/L	50		<50		<50		<50		<50	
TPH C15-C28	µg/L	100		470		<100		1410		900	
TPH C29-C36	µg/L	50		290		<50		1060		440	
TPH C6 - C9	µg/L	20		<20		<20		70		<20	
TPH+C10 - C36 (Sum of total)	µg/L	50		760		<50		2470		1340	
BTEX											
Benzene	µg/L	1	700	<1		<1		<1		<1	
Ethylbenzene	µg/L	1		<2		<2		<2		<2	
Toluene	µg/L	1		<5		7		39		<5	
Xylene (m & p)	µg/L	2		<2		<2		<2		<2	
Xylene (o)	µg/L	1		<2		<2		<2		<2	
Total Xylene (ESDAT)	µg/L	2		<2		<2		<2		<2	
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1									
2,4,5-trichlorophenol	µg/L	0.1		<1		<1		<1		<1	
2,4,6-trichlorophenol	µg/L	0.1		<1		<1		<1		<1	
2,4-dichlorophenol	µg/L	0.1		<1		<1		<1		<1	
2,6-dichlorophenol	µg/L	0.1		<1		<1		<1		<1	
2-chlorophenol	µg/L	0.05		<1		<1		<1		<1	
Pentachlorophenol	µg/L	0.05	22	<2		<2		<2		<2	
tetrachlorophenols	µg/L	30									
Herbicides											
Dinoseb	µg/L	100									
Inorganics											
Ammonia as N	mg/L	0.01			<0.1		1.42				
Cyanide (Free)	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
Cyanide (WAD)	mg/L	0.01									
Lead											
Lead (Filtered)	µg/L	0.1	4.4	0.6		6.4		2.8		0.9	
MAH											
Styrene	µg/L	5									
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002		<0.002		<0.002		<0.002	
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5		38.5		<0.5		123		88.1	
Total BTEX	mg/L	0.01									
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1									
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		<1		<1		<1		<1	
2,4-dinitrophenol	mg/L	0.03									
2-methylnaphthalene	µg/L	0.1			<0.1		<0.1		<0.1		<0.1
2-methylphenol	µg/L	0.1		<1	<0.1	<1	<0.1	<1	0.6	<1	<0.1
2-nitrophenol	µg/L	0.1		<1		<1		<1		<1	
3-&4-methylphenol	µg/L	2		<2		<2		<2		<2	
3-methylcholanthrene	µg/L	0.1									
3-Methylphenol	µg/L	0.1			<0.1		<0.1		<0.1		<0.1
4,6-Dinitro-2-methylphenol	µg/L	30									
4-chloro-3-methylphenol	µg/L	0.05		<1		<1		<1		<1	
4-methylphenol	mg/L	1E-04			<0.0001		<0.0001		<0.0001		<0.0001
4-nitrophenol	µg/L	0.1									
2-(acetylamino) fluorene	µg/L	0.1									
Benzo(e)pyrene	µg/L	0.1									
Coronene	µg/L	0.1									
Dibenzofuran	µg/L	2									
Hexachlorophene	µg/L	0.1									
Perylene	µg/L	0.1									
Acenaphthene	µg/L	0.01		<1		<1		<1		<1	
Acenaphthylene	µg/L	0.01		<1		<1		3.2		2.3	
Anthracene	µg/L	0.01		1.5		<1		3.8		3	
Benz(a)anthracene	µg/L	0.01		3		<1		10.9		6.8	
Benzo(a) pyrene	µg/L	0.01		3.4		<0.5		12.7		8.2	
Benzo(b)&(k)fluoranthene	µg/L	0.05									
Benzo(b)fluoranthene	µg/L	0.1		3.5		<1		15		9.1	
Benzo(g,h,i)perylene	µg/L	0.01		2		<1		8.9		4.7	
Benzo(k)fluoranthene	µg/L	0.1		1.6		<1		5.7		3.6	
Chrysene	µg/L	0.01		3.2		<1		8.9		6.2	
Dibenz(a,h)anthracene	µg/L	0.01		<1		<1		1.7		1.2	
Fluoranthene	µg/L	0.01		6.6		<1		17.7		12.8	
Fluorene	µg/L	0.01		<1		<1		<1		<1	
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		1.6		<1		6.4		4.1	
Naphthalene	µg/L	0.01	70	<1		<1		<1		<5 - 1.2	
Phenanthrene	µg/L	0.01		4.3		<1		6		5.2	
Phenol	µg/L	0.1	400	<1		<1		<1		<1	
Pyrene	µg/L	0.01		7.8		<1		21.7		19.7	
CPAH (ESDAT)	µg/L			19.3		<7.5		70.2		43.9	
PAH (ESDAT TOTAL)	µg/L			43.5		<15.5		125.6		90.1	
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.001		<0.001		<0.001		<0.001	

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

AECOM

Table T6
Groundwater Analytical Results

			Location_Code	BH413	BH413	BH046	AECOM_BH62	AECOM_BH68	AECOM_BH69	BH198	BH200
			Well	IT07	IT07	MW08	MW62	MW68	MW69	MW198	MW200
			Field_ID	IT07_DEEP	IT07_Deep	MW08	MW62	MW68	MW69	MW198	MW200
			Sampled_Date_Time	19/04/2011	20/04/2011	28/02/2011	24/02/2011	24/02/2011	25/02/2011	25/02/2011	28/02/2011
			SDG	ES1108478	ES1108663	ES1104220	ES1104095	ES1104095	ES1104161	ES1104161	ES1104220
			Sample Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
			SampleCode	ES1108478003	ES1108663003	ES1104220002	ES1104095002	ES1104095003	ES1104161001	ES1104161006	ES1104220004
			Monitoring_Zone	ORWS	ORWS	Public Domain Blocks 4&5	VMP & PDA - Block 5	VMP & PDA - Block 5	Block 5	VMP & PDA - Block 5	VMP & PDA - Block 4
ChemName		**output unit**	**EQL**	**ANZECC (2000) Marine (95%)**							
Metals											
	Aluminium (Filtered)	mg/L	0.005		0.01		0.03	<0.01	<0.01	0.01	0.021	0.014
	Antimony (Filtered)	mg/L	2E-04		<0.0005		0.0008	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002
	Arsenic (Filtered)	µg/L	0.2		2.4		8.2	0.7	<0.5	0.6	3.8	5.3
	Barium (Filtered)	mg/L	5E-04		0.189		1.67	0.433	0.107	0.123	0.0525	0.0854
	Beryllium (Filtered)	µg/L	0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Cadmium (Filtered)	µg/L	0.05	5.5	<0.2		0.2	<0.2	<0.2	<0.2	1	0.11
	Chromium (Filtered)	µg/L	0.2	4.4	<0.5		<0.5	<0.5	<0.5	<0.5	1.1	0.9
	Chromium (hexavalent) (Filtered)	mg/L	0.01									
	Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274								
	Cobalt (Filtered)	µg/L	0.1	1	1.9		0.5	0.2	<0.2	0.3	0.6	1.5
	Copper (Filtered)	µg/L	0.5	1.3	<1		<1	<1	<1	<1	<0.5	<0.5
	Manganese (Filtered)	mg/L	5E-04		0.254		0.235	0.0725	0.175	0.168	0.103	0.85
	Mercury (Filtered)	µg/L	0.1	0.1*	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	0.2
	Nickel (Filtered)	µg/L	0.5	70	2.2		9.5	3	3	<0.5	69.1	46.4
	Selenium (Filtered)	mg/L	2E-04		<0.002		<0.002	<0.002	<0.002	<0.002	<0.0002	0.0013
	Silver (Filtered)	mg/L	1E-04	0.0014	0.0002		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Vanadium (Filtered)	µg/L	0.2	100	3.1		1.5	0.7	<0.5	<0.5	0.7	2.8
	Zinc (Filtered)	mg/L	0.001	0.015	0.006		0.006	<0.005	<0.005	0.012	0.008	0.008
TPH												
	TPH C15-C36	mg/L			0.46		2.27	0.44	<0.15	0.38	<0.15	17.25
	TPH C10 - C14	µg/L	50		<50		560	<50	<50	530	<50	47,400
	TPH C15-C28	µg/L	100		230		2110	390	<100	330	<100	17,200
	TPH C29-C36	µg/L	50		230		160	<50	<50	<50	<50	<50
	TPH C6 - C9	µg/L	20		<20		<20	<20	<20	210	<20	37,600
	TPH+C10 - C36 (Sum of total)	µg/L	50		460		2830	390	<50	860	<50	64600
BTEX												
	Benzene	µg/L	1	700	<1		6	<1	<1	52	<1	17,900
	Ethylbenzene	µg/L	1		<2		2	<2	<2	16	<2	659
	Toluene	µg/L	1		<5		<5	<5	<5	9	<5	1660
	Xylene (m & p)	µg/L	2		<2		2	<2	<2	13	<2	1350
	Xylene (o)	µg/L	1		<2		2	<2	<2	13	<2	560
	Total Xylene (ESDAT)	µg/L	2		<2		4	<4	<4	26	<4	1910
Halogenated Phenols												
	2,3,4,6-tetrachlorophenol	µg/L	0.1									
	2,4,5-trichlorophenol	µg/L	0.1		<1		<1	<1	<1	<5	<1	<98
	2,4,6-trichlorophenol	µg/L	0.1		<1		<1	<1	<1	<5	<1	<98
	2,4-dichlorophenol	µg/L	0.1		<1		<1	<1	<1	<5	<1	<98
	2,6-dichlorophenol	µg/L	0.1		<1		<1	<1	<1	<5	<1	<98
	2-chlorophenol	µg/L	0.05		<1		<1	<1	<1	<5	<1	<98
	Pentachlorophenol	µg/L	0.05	22	<2		<2	<2	<2	<10	<2	<196
	tetrachlorophenols	µg/L	30									
Herbicides												
	Dinoseb	µg/L	100									
Inorganics												
	Ammonia as N	mg/L	0.01									
	Cyanide (Free)	mg/L	0.004		<0.004		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
	Cyanide (WAD)	mg/L	0.01									
Lead												
	Lead (Filtered)	µg/L	0.1	4.4	0.5		<0.2	<0.2	<0.2	<0.2	<0.1	<0.1
MAH												
	Styrene	µg/L	5									
other												
	Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002		<0.002	<0.002	<0.002	<0.01	<0.002	<0.196
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5		22.9							
	Total BTEX	mg/L	0.01									
PAH												
	7,12-dimethylbenz(a)anthracene	µg/L	0.1									
PAH/Phenols												
	2,4-dimethylphenol	µg/L	0.1		<1		16.4	<1	<1	<5	<1	8690
	2,4-dinitrophenol	mg/L	0.03									
	2-methylnaphthalene	µg/L	0.1			<0.1						
	2-methylphenol	µg/L	0.1		<1	<0.1	15	<1	<1	<5	<1	6900
	2-nitrophenol	µg/L	0.1		<1		<1	<1	<1	<5	<1	<98
	3-&4-methylphenol	µg/L	2		<2		10.4	<2	<2	<10	<2	3640
	3-methylcholanthrene	µg/L	0.1									
	3-Methylphenol	µg/L	0.1			<0.1						
	4,6-Dinitro-2-methylphenol	µg/L	30									
	4-chloro-3-methylphenol	µg/L	0.05		<1		<1	<1	<1	<5	<1	<98
	4-methylphenol	mg/L	1E-04			<0.0001						
	4-nitrophenol	µg/L	0.1									
	2-(acetylamino) fluorene	µg/L	0.1									
	Benzo(e)pyrene	µg/L	0.1									
	Coronene	µg/L	0.1									
	Dibenzofuran	µg/L	2									
	Hexachlorophene	µg/L	0.1									
	Perylene	µg/L	0.1									
	Acenaphthene	µg/L	0.01		<1		2.1	<1	<1	11.7	<1	<98
	Acenaphthylene	µg/L	0.01		<1		<1	<1	<1	37.2	1.4	<98
	Anthracene	µg/L	0.01		<1		1.9	<1	<1	8.9	<1	<98
	Benz(a)anthracene	µg/L	0.01		2		<1	<1	<1	<5	<1	<98
	Benzo(a) pyrene	µg/L	0.01		2.3		<0.5	<0.5	<0.5	<5	<0.5	<98
	Benzo(b)&(k)fluoranthene	µg/L	0.05									
	Benzo(b)fluoranthene	µg/L	0.1		2.1		<1	<1	<1	<5	<1	<98
	Benzo(g,h,i)perylene	µg/L	0.01		1.4		<1	<1	<1	<5	<1	<98
	Benzo(k)fluoranthene	µg/L	0.1		1.5		<1	<1	<1	<5	<1	<98
	Chrysene	µg/L	0.01		1.8		<1	<1	<1	<5	<1	<98
	Dibenz(a,h)anthracene	µg/L	0.01		<1		<1	<1	<1	<5	<1	<98
	Fluoranthene	µg/L	0.01		4.2		<1	<1	<1	7.4	<1	<98
	Fluorene	µg/L	0.01		<1		2.2	<1	<1	5.7	<1	<98
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01		1.2		<1	<1	<1	<5	<1	<98
	Naphthalene	µg/L	0.01	70	<1		7.9	<1	<1	202	<1	5450
	Phenanthrene	µg/L	0.01		1.8		3.1	<1	<1	32	<1	<98
	Phenol	µg/L	0.1	400	<1		<1	<1	<1	<5	<1	836
	Pyrene	µg/L	0.01		4.6		<1	<1	<1	15.1	<1	<98
	CPAH (ESDAT)	µg/L			13.3		<7.5	<7.5	<7.5	<40	<7.5	<784
	PAH (ESDAT TOTAL)	µg/L			28.9		27.7	<15.5	<15.5	360	15.9	6920
Pesticides												
	Pesticides (total, NSW Waste 2008)	mg/L			<0.001		<0.001	<0.001	<0.001	<0.005	<0.001	<0.098

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

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Table T6
Groundwater Analytical Results

			Location_Code	BH204	BH209	BH210	BH401	BH401	BH401	BH198	IT05D
			Well	MW204S	MW209	MW210	MW401	MW401	MW401	MW198	-
			Field_ID	MW204S	MW209	MW210	MW401	QC615	QC616	QC618	QC643
			Sampled_Date_Time	25/02/2011	28/02/2011	24/02/2011	24/02/2011	24/02/2011	24/02/2011	25/02/2011	19/05/2011
			SDG	ES1104220	ES1104220	ES1104095	ES1104161	ES1104161	292248	ES1104161	ES1110580
			Sample Type	Normal	Normal	Normal	Normal				
			SampleCode	ES1104220001	ES1104220003	ES1104095001	ES1104161002	ES1104161008	S11-MA30474	ES1104161007	ES1110580007
			Monitoring_Zone	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Proposed Southern Cove	Block 5	Block 5	Block 5	VMP & PDA - Block 5	
ChemName	**output unit**	**EQL**	**ANZECC (2000) Marine (95%)**								
Metals											
Aluminium (Filtered)	mg/L	0.005		0.05	0.01	<0.01	<0.01	<0.01	<0.05	0.02	9.14
Antimony (Filtered)	mg/L	2E-04		0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.0002	<0.0005
Arsenic (Filtered)	µg/L	0.2		2	1.1	1.5	2.8	3.1	3	3.7	16.1
Barium (Filtered)	mg/L	5E-04		0.0854	0.048	0.075	5.25	5.27	5.4	0.0517	0.037
Beryllium (Filtered)	µg/L	0.1		<0.1	0.1	<0.1	<0.1	<0.1	<1	<0.1	14.1
Cadmium (Filtered)	µg/L	0.05	5.5	0.78	0.5	0.2	1.6	0.5	0.7	1.66	1.1
Chromium (Filtered)	µg/L	0.2	4.4	1	<0.5	<0.5	<0.5	<0.5	<1	1.1	<0.5
Chromium (hexavalent) (Filtered)	mg/L	0.01									
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274								
Cobalt (Filtered)	µg/L	0.1	1	1.2	0.3	0.3	1.6	1.4	1	0.6	142
Copper (Filtered)	µg/L	0.5	1.3	3.1	<1	<1	<1	<1	<1	<0.5	<1
Manganese (Filtered)	mg/L	5E-04		0.099	0.018	1.81	0.406	0.394	0.31	0.102	7.23
Mercury (Filtered)	µg/L	0.1	0.1*	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel (Filtered)	µg/L	0.5	70	72.1	55.7	164	66.4	64.2	47	64.6	169
Selenium (Filtered)	mg/L	2E-04		0.0005	<0.002	<0.002	<0.002	<0.002	0.003	<0.0002	0.004
Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.005	<0.0001	<0.0001
Vanadium (Filtered)	µg/L	0.2	100	4.7	1	<0.5	0.5	0.6	<5	0.7	1.8
Zinc (Filtered)	mg/L	0.001	0.015	0.019	0.006	0.016	0.016	0.011	0.009	0.008	0.461
TPH											
TPH C15-C36	mg/L			2.82	0.27	0.8	1.12	1.1	1.52	<0.15	<0.15
TPH C10 - C14	µg/L	50		8430	100	80	790	800	1000	<50	120
TPH C15-C28	µg/L	100		2690	220	730	1070	1050	1300	<100	<100
TPH C29-C36	µg/L	50		130	<50	70	<50	<50	220	<50	<50
TPH C6 - C9	µg/L	20		2380	100	<20	350	400	330	<20	90
TPH+C10 - C36 (Sum of total)	µg/L	50		11200	320	880	1860	1850	2500	<50	120
BTEX											
Benzene	µg/L	1	700	237	56	2	127	138	140	<1	32
Ethylbenzene	µg/L	1		169	15	3	<5	<5	4	<2	<2
Toluene	µg/L	1		440	5	<5	108	112	120	<5	8
Xylene (m & p)	µg/L	2		466	8	<2	27	30	31	<2	13
Xylene (o)	µg/L	1		229	10	<2	15	14	15	<2	5
Total Xylene (ESDAT)	µg/L	2		695	18	<4	42	44	46	<4	18
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1									<0.1
2,4,5-trichlorophenol	µg/L	0.1		<10	<1	<1	<4.9	<10	<10	<1	<0.1
2,4,6-trichlorophenol	µg/L	0.1		<10	<1	<1	<4.9	<10	<10	<1	<0.1
2,4-dichlorophenol	µg/L	0.1		<10	<1	<1	<4.9	<10	<3	<1	<0.1
2,6-dichlorophenol	µg/L	0.1		<10	<1	<1	<4.9	<10	<3	<1	<0.1
2-chlorophenol	µg/L	0.05		<10	<1	<1	<4.9	<10	<3	<1	<0.05
Pentachlorophenol	µg/L	0.05	22	<20	<2	<2	<9.8	<20	<10	<2	<0.05
tetrachlorophenols	µg/L	30							<30		
Herbicides											
Dinoseb	µg/L	100							<100		
Inorganics											
Ammonia as N	mg/L	0.01									
Cyanide (Free)	mg/L	0.004		<0.004	<0.004	<0.004	<0.004	<0.004	0.007	<0.004	<0.004
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004	<0.004	<0.004	<0.004	<0.004		<0.004	<0.004
Cyanide (WAD)	mg/L	0.01							0.01		
Lead											
Lead (Filtered)	µg/L	0.1	4.4	0.4	<0.2	<0.2	0.2	<0.2	<1	<0.1	8.5
MAH											
Styrene	µg/L	5									
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.02	<0.002	<0.002	<0.0098	<0.02	<0.01	<0.002	<0.00025
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5									
Total BTEX	mg/L	0.01							0.31		
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1									<0.1
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		61.4	1.2	<1	108	95.3	180	<1	10.3
2,4-dinitrophenol	mg/L	0.03							<0.03		
2-methylnaphthalene	µg/L	0.1									1
2-methylphenol	µg/L	0.1		<10	<1	<1	63.4	58.2	60	<1	2
2-nitrophenol	µg/L	0.1		<10	<1	<1	<4.9	<10	<10	<1	<0.1
3-&4-methylphenol	µg/L	2		<20	<2	<2	111	111	160	<2	
3-methylcholanthrene	µg/L	0.1									<0.1
3-Methylphenol	µg/L	0.1									<0.1
4,6-Dinitro-2-methylphenol	µg/L	30							<30		
4-chloro-3-methylphenol	µg/L	0.05		<10	<1	<1	<4.9	<10	<10	<1	<0.05
4-methylphenol	mg/L	1E-04									<0.0001
4-nitrophenol	µg/L	0.1							<30		<0.1
2-(acetylamino) fluorene	µg/L	0.1									<0.1
Benzo(e)pyrene	µg/L	0.1									<0.1
Coronene	µg/L	0.1									<0.1
Dibenzofuran	µg/L	2									
Hexachlorophene	µg/L	0.1									<0.1
Perylene	µg/L	0.1									<0.1
Acenaphthene	µg/L	0.01		85.5	1.8	<1	10.5	10.5	11	<1	<0.1
Acenaphthylene	µg/L	0.01		45.4	6.2	3.1	12.8	12.1	10	2.4	0.2
Anthracene	µg/L	0.01		<10	1	<1	<4.9	<10	2	<1	<0.1
Benz(a)anthracene	µg/L	0.01		<10	1	1.1	<4.9	<10	<1	<1	<0.1
Benzo(a) pyrene	µg/L	0.01		<10	0.8	0.9	<4.9	<10	<1	<0.5	<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05							<2		
Benzo(b)fluoranthene	µg/L	0.1		<10	<1	<1	<4.9	<10		<1	<0.1
Benzo(g,h,i)perylene	µg/L	0.01		<10	<1	<1	<4.9	<10	<1	<1	<0.1
Benzo(k)fluoranthene	µg/L	0.1		<10	<1	<1	<4.9	<10		<1	<0.1
Chrysene	µg/L	0.01		<10	<1	<1	<4.9	<10	<1	<1	<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<10	<1	<1	<4.9	<10	<1	<1	<0.1
Fluoranthene	µg/L	0.01		<10	1.2	2.6	<4.9	<10	3	<1	<0.1
Fluorene	µg/L	0.01		80.6	<1	<1	9.4	11.4	11	<1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<10	<1	<1	<4.9	<10	<1	<1	<0.1
Naphthalene	µg/L	0.01	70	8580	10.8	<1	195	184	270	<1	60 - 63.7
Phenanthrene	µg/L	0.01		54.6	2	<1	16.3	15	15	<1	<0.1
Phenol	µg/L	0.1	400	<10	<1	<1	15	15.4	<50	<1	<0.1
Pyrene	µg/L	0.01		<10	1.8	4.2	5.2	<10	3	<1	<0.1
CPAH (ESDAT)	µg/L			<80	7.8	8	<39.2	<80	<6	<7.5	<0.75
PAH (ESDAT TOTAL)	µg/L			8956.1	33.6	22.9	298.2	343	331	16.9	65.2
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.01	<0.001	<0.001	<0.0049	<0.01	<0.01	<0.001	<0.00005

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

AECOM

Table T6
Groundwater Analytical Results

			Location_Code	IT04M	IT04M
			Well	-	IT04M
			Field_ID	QC644	QC645
			Sampled_Date_Time	19/05/2011	19/05/2011
			SDG	ES1110580	300143
			Sample Type		
			SampleCode	ES1110580008	S11-My32646
			Monitoring_Zone		
ChemName	output unit	EQL	ANZECC (2000) Marine (95%)		
Metals					
Aluminium (Filtered)	mg/L	0.005		0.02	<0.01
Antimony (Filtered)	mg/L	2E-04		<0.0005	<0.005
Arsenic (Filtered)	µg/L	0.2		1	18
Barium (Filtered)	mg/L	5E-04		0.117	0.1
Beryllium (Filtered)	µg/L	0.1		<0.1	<1
Cadmium (Filtered)	µg/L	0.05	5.5	<0.2	<0.1
Chromium (Filtered)	µg/L	0.2	4.4	<0.5	17
Chromium (hexavalent) (Filtered)	mg/L	0.01			
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274		
Cobalt (Filtered)	µg/L	0.1	1	0.7	2
Copper (Filtered)	µg/L	0.5	1.3	11	10
Manganese (Filtered)	mg/L	5E-04		0.187	0.18
Mercury (Filtered)	µg/L	0.1	0.1*	<0.1	<0.1
Nickel (Filtered)	µg/L	0.5	70	1.8	35
Selenium (Filtered)	mg/L	2E-04		<0.002	<0.005
Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001	<0.0001
Vanadium (Filtered)	µg/L	0.2	100	1	10
Zinc (Filtered)	mg/L	0.001	0.015	0.005	0.011
TPH					
TPH C15-C36	mg/L			<0.15	
TPH C10 - C14	µg/L	50		<50	
TPH C15-C28	µg/L	100		<100	
TPH C29-C36	µg/L	50		<50	
TPH C6 - C9	µg/L	20		<20	
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	
BTEX					
Benzene	µg/L	1	700	<1	
Ethylbenzene	µg/L	1		<2	
Toluene	µg/L	1		<5	
Xylene (m & p)	µg/L	2		<2	
Xylene (o)	µg/L	1		<2	
Total Xylene (ESDAT)	µg/L	2		<2	
Halogenated Phenols					
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.1	
2,4,5-trichlorophenol	µg/L	0.1		<0.1	<2
2,4,6-trichlorophenol	µg/L	0.1		<0.1	<2
2,4-dichlorophenol	µg/L	0.1		<0.1	<2
2,6-dichlorophenol	µg/L	0.1		<0.1	
2-chlorophenol	µg/L	0.05		<0.05	<2
Pentachlorophenol	µg/L	0.05	22	<0.05	<10
tetrachlorophenols	µg/L	30			
Herbicides					
Dinoseb	µg/L	100			
Inorganics					
Ammonia as N	mg/L	0.01			
Cyanide (Free)	mg/L	0.004		<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004		0.005	
Cyanide (WAD)	mg/L	0.01			
Lead					
Lead (Filtered)	µg/L	0.1	4.4	0.3	<1
MAH					
Styrene	µg/L	5			
other					
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.00025	<0.01
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5			
Total BTEX	mg/L	0.01			
PAH					
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1	
PAH/Phenols					
2,4-dimethylphenol	µg/L	0.1		<0.1	<2
2,4-dinitrophenol	mg/L	0.03			
2-methylnaphthalene	µg/L	0.1		0.1	
2-methylphenol	µg/L	0.1		<0.1	<2
2-nitrophenol	µg/L	0.1		<0.1	<2
3-&4-methylphenol	µg/L	2			<4
3-methylcholanthrene	µg/L	0.1		<0.1	
3-Methylphenol	µg/L	0.1		<0.1	
4,6-Dinitro-2-methylphenol	µg/L	30			
4-chloro-3-methylphenol	µg/L	0.05		<0.05	<2
4-methylphenol	mg/L	1E-04		<0.0001	
4-nitrophenol	µg/L	0.1		<0.1	
2-(acetylamino) fluorene	µg/L	0.1		<0.1	
Benzo(e)pyrene	µg/L	0.1		<0.1	
Coronene	µg/L	0.1		<0.1	
Dibenzofuran	µg/L	2			
Hexachlorophene	µg/L	0.1		<0.1	
Perylene	µg/L	0.1		<0.1	
Acenaphthene	µg/L	0.01		0.3	0.3
Acenaphthylene	µg/L	0.01		0.1	4.3
Anthracene	µg/L	0.01		0.2	1.8
Benz(a)anthracene	µg/L	0.01		<0.1	6
Benzo(a) pyrene	µg/L	0.01		0.07	5.3
Benzo(b)&(k)fluoranthene	µg/L	0.05			9.8
Benzo(b)fluoranthene	µg/L	0.1		<0.1	
Benzo(g,h,i)perylene	µg/L	0.01		<0.1	2.9
Benzo(k)fluoranthene	µg/L	0.1		<0.1	
Chrysene	µg/L	0.01		<0.1	4.4
Dibenz(a,h)anthracene	µg/L	0.01		<0.1	1.2
Fluoranthene	µg/L	0.01		0.5	9.2
Fluorene	µg/L	0.01		0.3	0.5
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1	2.7
Naphthalene	µg/L	0.01	70	<5 - 0.4	0.8
Phenanthrene	µg/L	0.01		0.9	4.1
Phenol	µg/L	0.1	400	<0.1	<2
Pyrene	µg/L	0.01		0.6	13
CPAH (ESDAT)	µg/L			0.77	22.5
PAH (ESDAT TOTAL)	µg/L			4.07	56.5
Pesticides					
Pesticides (total, NSW Waste 2008)	mg/L			<0.00005	<0.002

Notes

Shading indicates criteria exceedence

mg/L - milligrams pre litre

µg/L - micrograms per litre

LOR - Laboratory Limit of Reporting

< denotes result less than the LOR

ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values

* ANZECC (2000) 99% trigger value

CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

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Table T7
Leachate Results

		Location_Code	BH400	BH401	BH401	BH402	BH402	BH403	BH403	BH403	BH403	BH403	BH403	BH405	BH405	BH405	BH406	BH406
		Sample_Depth_Range	15.000-15.400	10.000-10.400	20.000-20.150	15.000-15.500	16.000-16.300	10.000-10.400	12.000-12.400	12.000-12.400	15.000-15.400	8.000-8.400	8.000-8.400	14.000-14.400	7.000-7.300	7.000-7.300	16.000-16.500	16.000-16.500
		Field_ID	BH400_15-15.4	BH401_10-10.4	BH401_20.20.15	BH402_15-15.5	BH402_16-16.3	BH403_10-10.4	BH403_12.0-12.4	BH403_12.0-12.4	BH403_15-15.4	BH403_8.0-8.4	BH403_8.0-8.4	BH405_14.0-14.4	BH405_7.0-7.3	BH405_7.0-7.3	BH406_16.0-16.5	BH406_16.0-16.5
		Sampled_Date_Time	14/02/2011	10/02/2011	11/02/2011	9/02/2011	10/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	11/02/2011	10/02/2011	10/02/2011	9/02/2011	9/02/2011
		SampleCode	ES1104964001	ES1104964002	ES1104964003	ES1104964004	ES1104964005	ES1104964006	ES1103957002	ES1103960002	ES1104964007	ES1103957001	ES1103960001	ES1103960004	ES1103957003	ES1103960003	ES1103957004	ES1103960006
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Block 4	Block 4
		Method	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	TCLP	ASLP	ASLP	TCLP	ASLP	ASLP	TCLP	ASLP	TCLP	ASLP
ChemName	**output unit**	**LOR**																
EK055G: Ammonia as N by Discrete Analyser																		
Ammonia as N	mg/L	0.01	0.5			0.12	0.15	0.78			0.14							
ESDAT Combined																		
Total Xylene (ESDAT)	µg/L		<4	<4	<4	318	46	2699			2705							
TPH C15-C36	mg/L																	
TPH+C10 - C36 (Sum of total)	µg/L		360			14,600	7620	113,000			73,500							
EG035C: Leachable Mercury by FIMS																		
Mercury	µg/L	1							<1			<1			<1		<1	
EG005C: Leachable Metals by ICPAES																		
Arsenic	µg/L	100							<100			<100			<100		<100	
Cadmium	µg/L	50							<50			<50			<50		<50	
Chromium	µg/L	100							<100			<100			<100		<100	
Copper	µg/L	100							<100			<100			<100		<100	
Lead	µg/L	100							<100			<100			200		<100	
Nickel	µg/L	100							<100			<100			<100		<100	
Zinc	mg/L	0.1							1.6			1.1			0.8		0.2	
EG035W: Water Leachable Mercury by FIMS																		
Mercury	µg/L	0.1								<0.1			<0.1	<0.1		<0.1		<0.1
EG020W: Water Leachable Metals by ICP-MS																		
Arsenic	µg/L	1								<1			10	<1		2		<1
Cadmium	µg/L	0.1								<0.1			0.1	<0.1		<0.1		<0.1
Chromium	µg/L	1								2			2	<1		1		<1
Copper	µg/L	1								1			9	<1		2		1
Lead	µg/L	1								1			12	<1		4		<1
Nickel	µg/L	1								<1			1	<1		<1		<1
Zinc	mg/L	0.005								0.14			0.161	0.161		0.099		0.296
EP075(SIM)A: Phenolic Compounds																		
2,4,5-trichlorophenol	µg/L	1																
2,4,6-trichlorophenol	µg/L	1																
2,4-dichlorophenol	µg/L	1																
2,4-dimethylphenol	µg/L	1																
2,6-dichlorophenol	µg/L	1																
2-chlorophenol	µg/L	1																
2-methylphenol	µg/L	1																
2-nitrophenol	µg/L	1																
3-&4-methylphenol	µg/L	2																
4-chloro-3-methylphenol	µg/L	1																
Pentachlorophenol	µg/L	2																
Phenol	µg/L	1																
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons																		
Acenaphthene	µg/L	1																
Acenaphthylene	µg/L	1																
Anthracene	µg/L	1																
Benz(a)anthracene	µg/L	1																
Benzo(a) pyrene	µg/L	0.5																
Benzo(b)fluoranthene	µg/L	1																
Benzo(g,h,i)perylene	µg/L	1																
Benzo(k)fluoranthene	µg/L	1																
Chrysene	µg/L	1																
Dibenz(a,h)anthracene	µg/L	1																
Fluoranthene	µg/L	1																
Fluorene	µg/L	1																
Indeno(1,2,3-c,d)pyrene	µg/L	1																
Naphthalene	µg/L	1																
Phenanthrene	µg/L	1																
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5																
Pyrene	µg/L	1																
PAH (ESDAT TOTAL)	µg/L								18,823	12,033		483.56	147.05	11,641	83.35	24.35	9811	18,626
EP132A: Phenolic Compounds																		
2,3,4,6-tetrachlorophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2,4,5-trichlorophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2,4,6-trichlorophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2,4-dichlorophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2,4-dimethylphenol	µg/L	0.1							4470	2210		16.4	2.4	271	7.8	3.7	1280	2090
2,6-dichlorophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2-chlorophenol	µg/L	0.05							<5	<0.5		<0.05	<0.05	<5	<0.05	<0.05	<5	<5
2-methylphenol	µg/L	0.1							8680	4740		1.8	0.8	66.6	4.4	0.7	1740	2600
2-nitrophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
3-Methylphenol	µg/L	0.1							10,200	5740		2.7	0.9	26.5	5.7	1.2	1830	2740
4-chloro-3-methylphenol	µg/L	0.05							<5	<0.5		<0.05	<0.05	<5	<0.05	<0.05	<5	<5
4-methylphenol	mg/L	0.0001							8.68	4.6		0.0005	0.0004	0.0184	0.0038	0.0007	1.58	2.3
4-nitrophenol	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
Hexachlorophene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
Pentachlorophenol	µg/L	0.05							<5	<0.5		<0.05	<0.05	<5	<0.05	<0.05	<5	<5
Phenol	µg/L	0.1							8040	3700		0.7	0.6	<10	3	0.7	158	196
EP132B: Polynuclear Aromatic Hydrocarbons																		
2-(acetylamino) fluorene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
2-methylnaphthalene	µg/L	0.1							1010	721		53.6	7.1	701	11.5	3.4	642	794
3-methylcholanthrene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
7,12-dimethylbenz(a)anthracene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
Acenaphthene	µg/L	0.1							59	38.2		19.8	18.4	52.2	1.2	0.4	40.3	52.9
Acenaphthylene	µg/L	0.1							562	404		23.6	10	381	6.8	1.9	366	456
Anthracene	µg/L	0.1							40.3	32.2		8.6	5.4	29.7	1.5	0.7	23	29.7

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Table T7
Leachate Results

		Location_Code	BH400	BH401	BH401	BH402	BH402	BH403	BH403	BH403	BH403	BH403	BH403	BH405	BH405	BH405	BH406	BH406
		Sample_Depth_Range	15.000-15.400	10.000-10.400	20.000-20.150	15.000-15.500	16.000-16.300	10.000-10.400	12.000-12.400	12.000-12.400	15.000-15.400	8.000-8.400	8.000-8.400	14.000-14.400	7.000-7.300	7.000-7.300	16.000-16.500	16.000-16.500
		Field_ID	BH400_15-15.4	BH401_10-10.4	BH401_20.20.15	BH402_15-15.5	BH402_16-16.3	BH403_10-10.4	BH403_12.0-12.4	BH403_12.0-12.4	BH403_15-15.4	BH403_8.0-8.4	BH403_8.0-8.4	BH405_14.0-14.4	BH405_7.0-7.3	BH405_7.0-7.3	BH406_16.0-16.5	BH406_16.0-16.5
		Sampled_Date_Time	14/02/2011	10/02/2011	11/02/2011	9/02/2011	10/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	9/02/2011	11/02/2011	10/02/2011	10/02/2011	9/02/2011	9/02/2011
		SampleCode	ES1104964001	ES1104964002	ES1104964003	ES1104964004	ES1104964005	ES1104964006	ES1103957002	ES1103960002	ES1104964007	ES1103957001	ES1103960001	ES1103960004	ES1103957003	ES1103960003	ES1103957004	ES1103960006
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	Block 5	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Block 4	Block 4
		Method	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	TCLP	ASLP	ASLP	TCLP	ASLP	ASLP	TCLP	ASLP	TCLP	ASLP
ChemName	**output unit**	**LOR**																
Benz(a)anthracene	µg/L	0.1							<10	<1		0.5	0.6	<10	<0.1	<0.1	<10	<10
Benzo(a) pyrene	µg/L	0.05							<5	<0.5		0.06	0.35	<5	<0.05	<0.05	<5	<5
Benzo(b)fluoranthene	µg/L	0.1							<10	<1		0.1	0.3	<10	<0.1	<0.1	<10	<10
Benzo(e)pyrene	µg/L	0.1							<10	<1		<0.1	0.2	<10	<0.1	<0.1	<10	<10
Benzo(g,h,i)perylene	µg/L	0.1							<10	<1		<0.1	0.2	<10	<0.1	<0.1	<10	<10
Benzo(k)fluoranthene	µg/L	0.1							<10	<1		<0.1	0.2	<10	<0.1	<0.1	<10	<10
Chrysene	µg/L	0.1							<10	<1		0.4	0.6	<10	<0.1	<0.1	<10	<10
Coronene	µg/L	0.1							<10	<1		<0.1	0.3	<10	<0.1	<0.1	<10	<10
Dibenz(a,h)anthracene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
Fluoranthene	µg/L	0.1							17.6	11.2		6.4	7.4	13.1	1.1	0.8	<10	13
Fluorene	µg/L	0.1							188	114		37	19.3	157	5.7	2	128	163
Indeno(1,2,3-c,d)pyrene	µg/L	0.1							<10	<1		<0.1	0.1	<10	<0.1	<0.1	<10	<10
Naphthalene	µg/L	0.1							17,700	11,300		342	46.1	10,800	58.3	13.9	9060	17,700
Perylene	µg/L	0.1							<10	<1		<0.1	<0.1	<10	<0.1	<0.1	<10	<10
Phenanthrene	µg/L	0.1							167	117		39	31.4	123	7.2	3.2	98.7	126
Pyrene	µg/L	0.1							13.8	8.4		5.7	6.6	<10	0.8	0.7	<10	<10
CPAH (ESDAT)	µg/L								<75	<7.5		1.46	2.45	<75	<0.75	<0.75	<75	<75
EP075B: Polynuclear Aromatic Hydrocarbons																		
2-methylnaphthalene	µg/L	2	20			652	300	902			823							
EP075H: Anilines and Benzidines																		
Dibenzofuran	µg/L	2	8			101	91	144			139							
EK026G: Total Cyanide By Discrete Analyser																		
Cyanide Total	mg/L	0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004			<0.04							
EP080/071: Total Petroleum Hydrocarbons																		
TPH C10 - C14	µg/L	50	360			14,600	7620	113,000			73,500							
TPH C15-C28	µg/L	100																
TPH C29-C36	µg/L	50																
TPH+C10 - C36 (Sum of total)	µg/L	50																
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft																		
>C10 - C16 Fraction	mg/L	0.1																
>C10 - C40 Fraction (sum)	µg/L	100																
>C16 - C34 Fraction	mg/L	0.1																
>C34 - C40 Fraction	mg/L	0.1																
TPH C10 - C40 (Sum of total)	µg/L	100																
EP080/071: Total Petroleum Hydrocarbons																		
TPH C6 - C9	µg/L	20	<20	<20	<20	620	70	13,900			8620							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft																		
TPH C6-C10	mg/L	0.02																
EP080: BTEXN																		
Total Xylene (ESDAT)	µg/L	2																
Benzene	µg/L	1																
Ethylbenzene	µg/L	2																
Naphthalene	µg/L	5																
Toluene	µg/L	2																
Xylene (m & p)	µg/L	2																
Xylene (o)	µg/L	2																
EP074A: Monocyclic Aromatic Hydrocarbons																		
Benzene	µg/L	1	<1	<1	<1	43	2	3500			641							
Ethylbenzene	µg/L	2	<2	<2	<2	18	2	166			165							
Styrene	µg/L	5	<5	<5	<5	<5	<5	1110			1140							
Toluene	µg/L	2	<5	<5	<5	156	19	4220			2180							
Xylene (m & p)	µg/L	2	<2	<2	<2	226	32	1920			1900							
Xylene (o)	µg/L	2	<2	<2	<2	92	14	779			805							
EG035W: Water Leachable Mercury by FIMS																		
Mercury	µg/L	0.1								<0.1			<0.1	<0.1		<0.1		<0.1
EG020W: Water Leachable Metals by ICP-MS																		
Arsenic	µg/L	1								<1			10	<1		2		<1
Cadmium	µg/L	0.1								<0.1			0.1	<0.1		<0.1		<0.1
Chromium	µg/L	1								2			2	<1		1		<1
Copper	µg/L	1								1			9	<1		2		1
Lead	µg/L	1								1			12	<1		4		<1
Nickel	µg/L	1								<1			1	<1		<1		<1
Zinc	mg/L	0.005								0.14			0.161	0.161		0.099		0.296

Notes
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
< denotes result less than the LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)
ASLP - Australian Standard Leaching Procedure
TCLP - Total Characteristic Leaching Procedure

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Table T7
Leachate Results

		Location_Code	BH406	BH407	BH408	BH408	BH409	BH409	BH409	BH409	BH410	BH410	BH410	BH410
		Sample_Depth_Range	7.000-7.400	15.100-15.450	2.000-2.400	9.000-9.400	3.700-4.000	3.700-4.000	6.000-6.400	7.000-7.300	17.000-17.500	17.000-17.500	2.000-2.200	23.000-23.200
		Field_ID	BH406_7.0-7.4	BH407_15.1-15.45	BH408_2.0-2.4	BH408_9.0-9.4	BH409_3.7-4.0	BH409_3.7-4.0	BH409_6.0-6.4	BH409_7.0-7.3	BH410_17.0-17.5	QC639	BH410_2.0-2.2	BH410_23.0-23.2
		Sampled_Date_Time	8/02/2011	14/02/2011	14/02/2011	15/02/2011	14/02/2011	14/02/2011	15/02/2011	15/02/2011	11/05/2011	11/05/2011	10/05/2011	11/05/2011
		SampleCode	ES1103960005	ES1104964008	ES1103960007	ES1103960008	ES1103957005	ES1103960009	ES1104964009	ES1103960010	ES1110516010	ES1110516026	ES1110516003	ES1110516016
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Block 4	Proposed Southern Cove	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5
		Method					TCLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**												
EK055G: Ammonia as N by Discrete Analyser														
Ammonia as N	mg/L	0.01		0.2					0.28		0.62	0.66	0.04	<0.01
ESDAT Combined														
Total Xylene (ESDAT)	µg/L			4					12		<4	<4	<4	<4
TPH C15-C36	mg/L										0.63	0.79	<0.15	<0.15
TPH+C10 - C36 (Sum of total)	µg/L			570					370		760	980	<200	<200
EG035C: Leachable Mercury by FIMS														
Mercury	µg/L	1					<1							
EG005C: Leachable Metals by ICPAES														
Arsenic	µg/L	100					<100							
Cadmium	µg/L	50					<50							
Chromium	µg/L	100					<100							
Copper	µg/L	100					<100							
Lead	µg/L	100					<100							
Nickel	µg/L	100					<100							
Zinc	mg/L	0.1					0.4							
EG035W: Water Leachable Mercury by FIMS														
Mercury	µg/L	0.1	<0.1		<0.1	<0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
EG020W: Water Leachable Metals by ICP-MS														
Arsenic	µg/L	1	4		<1	<1		<1		<1	3	3	3	<1
Cadmium	µg/L	0.1	<0.1		<0.1	0.2		0.2		<0.1	0.7	1	0.2	0.1
Chromium	µg/L	1	1		<1	19		6		<1	1	2	<1	2
Copper	µg/L	1	4		<1	6		7		<1	17	18	3	2
Lead	µg/L	1	8		<1	5		2		<1	3	1	4	<1
Nickel	µg/L	1	2		<1	28		<1		<1	5	5	2	8
Zinc	mg/L	0.005	0.072		0.104	0.576		0.444		0.073	0.592	0.677	0.209	0.108
EP075(SIM)A: Phenolic Compounds														
2,4,5-trichlorophenol	µg/L	1									<1	<1	<1	<1
2,4,6-trichlorophenol	µg/L	1									<1	<1	<1	<1
2,4-dichlorophenol	µg/L	1									<1	<1	<1	<1
2,4-dimethylphenol	µg/L	1									<1	<1	<1	<1
2,6-dichlorophenol	µg/L	1									<1	<1	<1	<1
2-chlorophenol	µg/L	1									<1	<1	<1	<1
2-methylphenol	µg/L	1									<1	<1	<1	<1
2-nitrophenol	µg/L	1									<1	<1	<1	<1
3-&4-methylphenol	µg/L	2									<2	<2	<2	<2
4-chloro-3-methylphenol	µg/L	1									<1	<1	<1	<1
Pentachlorophenol	µg/L	2									<2	<2	<2	<2
Phenol	µg/L	1									<1	<1	<1	<1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons														
Acenaphthene	µg/L	1									10.3	21.6	<1	<1
Acenaphthylene	µg/L	1									3.8	10.5	<1	<1
Anthracene	µg/L	1									3.8	11.9	<1	<1
Benz(a)anthracene	µg/L	1									<1	<1	<1	<1
Benzo(a) pyrene	µg/L	0.5									<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	µg/L	1									<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	1									<1	<1	<1	<1
Benzo(k)fluoranthene	µg/L	1									<1	<1	<1	<1
Chrysene	µg/L	1									<1	<1	<1	<1
Dibenz(a,h)anthracene	µg/L	1									<1	<1	<1	<1
Fluoranthene	µg/L	1									3	7.6	<1	<1
Fluorene	µg/L	1									9.4	20.8	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	1									<1	<1	<1	<1
Naphthalene	µg/L	1									10.7	33	<1	<1
Phenanthrene	µg/L	1									17.6	45.2	<1	<1
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5									60.7	156	<0.5	<0.5
Pyrene	µg/L	1									2.1	5.4	<1	<1
PAH (ESDAT TOTAL)	µg/L		3077.5		48.85	30.25	218.75	32.15		1102.45	68.2	163.5	<15.5	<15.5
EP132A: Phenolic Compounds														
2,3,4,6-tetrachlorophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2,4,5-trichlorophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2,4,6-trichlorophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2,4-dichlorophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2,4-dimethylphenol	µg/L	0.1	113		3.4	<0.1	13.4	0.6		2.7				
2,6-dichlorophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2-chlorophenol	µg/L	0.05	<5		<0.05	<0.05	<0.05	<0.05		<0.05				
2-methylphenol	µg/L	0.1	<10		2	<0.1	5.5	0.2		3.6				
2-nitrophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
3-Methylphenol	µg/L	0.1	<10		2.2	<0.1	5.9	0.3		1.5				
4-chloro-3-methylphenol	µg/L	0.05	<5		<0.05	<0.05	<0.05	<0.05		<0.05				
4-methylphenol	mg/L	0.0001	<0.01		0.0017	<0.0001	0.0045	0.0001		0.0028				
4-nitrophenol	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Hexachlorophene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Pentachlorophenol	µg/L	0.05	<5		<0.05	<0.05	<0.05	<0.05		<0.05				
Phenol	µg/L	0.1	<10		0.8	<0.1	0.6	0.2		1.2				
EP132B: Polynuclear Aromatic Hydrocarbons														
2-(acetylamino) fluorene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
2-methylnaphthalene	µg/L	0.1	288		5.7	5.6	31.6	7.3		302				
3-methylcholanthrene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
7,12-dimethylbenz(a)anthracene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Acenaphthene	µg/L	0.1	139		0.4	0.4	3.8	1.6		13.6				
Acenaphthylene	µg/L	0.1	<10		3	2.9	16.6	1.4		90.4				
Anthracene	µg/L	0.1	36.5		0.8	0.2	4.8	1.2		11.7				

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Table T7
Leachate Results

		Location_Code	BH406	BH407	BH408	BH408	BH409	BH409	BH409	BH409	BH410	BH410	BH410	BH410
		Sample_Depth_Range	7.000-7.400	15.100-15.450	2.000-2.400	9.000-9.400	3.700-4.000	3.700-4.000	6.000-6.400	7.000-7.300	17.000-17.500	17.000-17.500	2.000-2.200	23.000-23.200
		Field_ID	BH406_7.0-7.4	BH407_15.1-15.45	BH408_2.0-2.4	BH408_9.0-9.4	BH409_3.7-4.0	BH409_3.7-4.0	BH409_6.0-6.4	BH409_7.0-7.3	BH410_17.0-17.5	QC639	BH410_2.0-2.2	BH410_23.0-23.2
		Sampled_Date_Time	8/02/2011	14/02/2011	14/02/2011	15/02/2011	14/02/2011	14/02/2011	15/02/2011	15/02/2011	11/05/2011	11/05/2011	10/05/2011	11/05/2011
		SampleCode	ES1103960005	ES1104964008	ES1103960007	ES1103960008	ES1103957005	ES1103960009	ES1104964009	ES1103960010	ES1110516010	ES1110516026	ES1110516003	ES1110516016
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Block 4	Proposed Southern Cove	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5
		Method					TCLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**												
Benz(a)anthracene	µg/L	0.1	<10		<0.1	<0.1	0.2	0.1		0.6				
Benzo(a) pyrene	µg/L	0.05	<5		<0.05	<0.05	<0.05	<0.05		<0.05				
Benzo(b)fluoranthene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Benzo(e)pyrene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Benzo(g,h,i)perylene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Benzo(k)fluoranthene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Chrysene	µg/L	0.1	<10		<0.1	<0.1	0.1	0.1		0.5				
Coronene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Dibenz(a,h)anthracene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Fluoranthene	µg/L	0.1	19		1	<0.1	3.3	1.2		6				
Fluorene	µg/L	0.1	109		2.1	1.1	17.2	3		45.8				
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Naphthalene	µg/L	0.1	2510		36.7	23.7	150	16.3		862				
Perylene	µg/L	0.1	<10		<0.1	<0.1	<0.1	<0.1		<0.1				
Phenanthrene	µg/L	0.1	162		3.2	1	20	5.4		63				
Pyrene	µg/L	0.1	17		0.9	<0.1	2.2	1.3		8.3				
CPAH (ESDAT)	µg/L		<75		<0.75	<0.75	0.85	0.75		1.65	<7.5	<7.5	<7.5	<7.5
EP075B: Polynuclear Aromatic Hydrocarbons														
2-methylnaphthalene	µg/L	2		<2					20					
EP075H: Anilines and Benzidines														
Dibenzofuran	µg/L	2		<2					<2		4	10	<2	<2
EK026G: Total Cyanide By Discrete Analyser														
Cyanide Total	mg/L	0.004		<0.004					<0.04		<0.004	<0.004	<0.004	<0.004
EP080/071: Total Petroleum Hydrocarbons														
TPH C10 - C14	µg/L	50		570					370		130	190	<50	<50
TPH C15-C28	µg/L	100									580	740	<100	<100
TPH C29-C36	µg/L	50									<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50									710	930	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft														
>C10 - C16 Fraction	mg/L	0.1												
>C10 - C40 Fraction (sum)	µg/L	100												
>C16 - C34 Fraction	mg/L	0.1												
>C34 - C40 Fraction	mg/L	0.1												
TPH C10 - C40 (Sum of total)	µg/L	100									710	960	<100	<100
EP080/071: Total Petroleum Hydrocarbons														
TPH C6 - C9	µg/L	20		<20					<20		<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft														
TPH C6-C10	mg/L	0.02									<0.02	<0.02	<0.02	<0.02
EP080: BTEXN														
Total Xylene (ESDAT)	µg/L	2									<2	<2	<2	<2
Benzene	µg/L	1									<1	<1	<1	<1
Ethylbenzene	µg/L	2									<2	<2	<2	<2
Naphthalene	µg/L	5									<5	<5	<5	<5
Toluene	µg/L	2									<5	<5	<5	<5
Xylene (m & p)	µg/L	2									<2	<2	<2	<2
Xylene (o)	µg/L	2									<2	<2	<2	<2
EP074A: Monocyclic Aromatic Hydrocarbons														
Benzene	µg/L	1		<1					2					
Ethylbenzene	µg/L	2		<2					6					
Styrene	µg/L	5		<5					<5					
Toluene	µg/L	2		<5					<5					
Xylene (m & p)	µg/L	2		2					6					
Xylene (o)	µg/L	2		<2					6					
EG035W: Water Leachable Mercury by FIMS														
Mercury	µg/L	0.1	<0.1		<0.1	<0.1		<0.1		<0.1	<0.1	<0.1	<0.1	<0.1
EG020W: Water Leachable Metals by ICP-MS														
Arsenic	µg/L	1	4		<1	<1		<1		<1	3	3	3	<1
Cadmium	µg/L	0.1	<0.1		<0.1	0.2		0.2		<0.1	0.7	1	0.2	0.1
Chromium	µg/L	1	1		<1	19		6		<1	1	2	<1	2
Copper	µg/L	1	4		<1	6		7		<1	17	18	3	2
Lead	µg/L	1	8		<1	5		2		<1	3	1	4	<1
Nickel	µg/L	1	2		<1	28		<1		<1	5	5	2	8
Zinc	mg/L	0.005	0.072		0.104	0.576		0.444		0.073	0.592	0.677	0.209	0.108

Notes
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
< denotes result less than the LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)f Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Inden c,d)pyrene)
ASLP - Australian Standard Leaching Procedure
TCLP - Total Characteristic Leaching Procedure

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Table T7
Leachate Results

		Location_Code	BH410	BH410	BH410	BH411	BH411	BH411	BH411	BH412	BH412	BH412	BH412	BH413	BH413
		Sample_Depth_Range	26.000-26.200	32.000-32.200	7.000-7.200	10.000-10.100	19.000-19.100	23.000-23.100	3.100-3.200	19.000-19.300	22.000-22.200	4.000-4.100	8.000-8.100	1.100-1.300	15.000-15.500
		Field_ID	BH410_26.0-26.2	BH410_32.0-32.2	BH410_7.0-7.2	BH411_10.0-10.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_3.1-3.2	BH412_19.0-19.3	BH412_22.0-22.2	BH412_4.0-4.1	BH412_8.0-8.1	BH413_1.1-1.3	BH413_15.0-15.5
		Sampled_Date_Time	12/05/2011	12/05/2011	10/05/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	7/04/2011	8/04/2011	6/04/2011	6/04/2011	1/04/2011	5/04/2011
		SampleCode	ES1110516019	ES1110516025	ES1110516006	ES1108140011	ES1108140015	ES1108140019	ES1108140006	ES1107519015	ES1107519021	ES1107519007	ES1107519010	ES1107354001	ES1107354005
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	L	L	L	L	L	L
		Method	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**													
EK055G: Ammonia as N by Discrete Analyser															
Ammonia as N	mg/L	0.01	0.01	0.01	<0.01	0.02	0.15	0.35	0.04	0.13	0.04	0.03	0.03	<0.01	1.1
ESDAT Combined															
Total Xylene (ESDAT)	µg/L		<4	<4	<4										
TPH C15-C36	mg/L		<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15						
TPH+C10 - C36 (Sum of total)	µg/L		<200	<200	<200	<200	<200	<200	<200						
EG035C: Leachable Mercury by FIMS															
Mercury	µg/L	1													
EG005C: Leachable Metals by ICPAES															
Arsenic	µg/L	100													
Cadmium	µg/L	50													
Chromium	µg/L	100													
Copper	µg/L	100													
Lead	µg/L	100													
Nickel	µg/L	100													
Zinc	mg/L	0.1													
EG035W: Water Leachable Mercury by FIMS															
Mercury	µg/L	0.1	<0.1	<0.1	<0.1										
EG020W: Water Leachable Metals by ICP-MS															
Arsenic	µg/L	1	<1	<1	2										
Cadmium	µg/L	0.1	0.2	0.2	0.4										
Chromium	µg/L	1	<1	<1	6										
Copper	µg/L	1	2	3	5										
Lead	µg/L	1	<1	<1	5										
Nickel	µg/L	1	2	2	3										
Zinc	mg/L	0.005	0.205	0.292	0.234										
EP075(SIM)A: Phenolic Compounds															
2,4,5-trichlorophenol	µg/L	1	<1	<1	<1										
2,4,6-trichlorophenol	µg/L	1	<1	<1	<1										
2,4-dichlorophenol	µg/L	1	<1	<1	<1										
2,4-dimethylphenol	µg/L	1	<1	<1	<1										
2,6-dichlorophenol	µg/L	1	<1	<1	<1										
2-chlorophenol	µg/L	1	<1	<1	<1										
2-methylphenol	µg/L	1	<1	<1	<1										
2-nitrophenol	µg/L	1	<1	<1	<1										
3-&4-methylphenol	µg/L	2	<2	<2	<2										
4-chloro-3-methylphenol	µg/L	1	<1	<1	<1										
Pentachlorophenol	µg/L	2	<2	<2	<2										
Phenol	µg/L	1	<1	<1	<1										
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons															
Acenaphthene	µg/L	1	<1	<1	<1										
Acenaphthylene	µg/L	1	<1	<1	<1										
Anthracene	µg/L	1	<1	<1	<1										
Benz(a)anthracene	µg/L	1	<1	<1	<1										
Benzo(a) pyrene	µg/L	0.5	<0.5	<0.5	<0.5										
Benzo(b)fluoranthene	µg/L	1	<1	<1	<1										
Benzo(g,h,i)perylene	µg/L	1	<1	<1	<1										
Benzo(k)fluoranthene	µg/L	1	<1	<1	<1										
Chrysene	µg/L	1	<1	<1	<1										
Dibenz(a,h)anthracene	µg/L	1	<1	<1	<1										
Fluoranthene	µg/L	1	<1	1.1	<1										
Fluorene	µg/L	1	<1	<1	<1										
Indeno(1,2,3-c,d)pyrene	µg/L	1	<1	<1	<1										
Naphthalene	µg/L	1	<1	<1	<1										
Phenanthrene	µg/L	1	<1	2.1	<1										
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5	<0.5	4.2	<0.5										
Pyrene	µg/L	1	<1	1	<1										
PAH (ESDAT TOTAL)	µg/L		<15.5	16.7	<15.5	3.55	1.85	1.75	5.06						
EP132A: Phenolic Compounds															
2,3,4,6-tetrachlorophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5-trichlorophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-trichlorophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-dichlorophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-dimethylphenol	µg/L	0.1				<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-dichlorophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-chlorophenol	µg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-methylphenol	µg/L	0.1				<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-nitrophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
3-Methylphenol	µg/L	0.1				0.2	0.5	0.2	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4-chloro-3-methylphenol	µg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-methylphenol	mg/L	0.0001				<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
4-nitrophenol	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorophene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	µg/L	0.05				<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenol	µg/L	0.1				<0.1	0.5	<0.1	0.7	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons															
2-(acetylamino) fluorene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1				<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
3-methylcholanthrene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
7,12-dimethylbenz(a)anthracene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1				<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	1.6
Acenaphthylene	µg/L	0.1				<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Anthracene	µg/L	0.1				0.2	<0.1	<0.1	0.2	<0.1	<0.1	0.2	0.4	0.2	0.5

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Table T7
Leachate Results

		Location_Code	BH410	BH410	BH410	BH411	BH411	BH411	BH411	BH412	BH412	BH412	BH412	BH413	BH413
		Sample_Depth_Range	26.000-26.200	32.000-32.200	7.000-7.200	10.000-10.100	19.000-19.100	23.000-23.100	3.100-3.200	19.000-19.300	22.000-22.200	4.000-4.100	8.000-8.100	1.100-1.300	15.000-15.500
		Field_ID	BH410_26.0-26.2	BH410_32.0-32.2	BH410_7.0-7.2	BH411_10.0-10.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_3.1-3.2	BH412_19.0-19.3	BH412_22.0-22.2	BH412_4.0-4.1	BH412_8.0-8.1	BH413_1.1-1.3	BH413_15.0-15.5
		Sampled_Date_Time	12/05/2011	12/05/2011	10/05/2011	12/04/2011	12/04/2011	12/04/2011	12/04/2011	7/04/2011	8/04/2011	6/04/2011	6/04/2011	1/04/2011	5/04/2011
		SampleCode	ES1110516019	ES1110516025	ES1110516006	ES1108140011	ES1108140015	ES1108140019	ES1108140006	ES1107519015	ES1107519021	ES1107519007	ES1107519010	ES1107354001	ES1107354005
		Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
		Monitoring_Zone	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	Public Domain Blocks 4&5	L	L	L	L	L	L
		Method	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**													
Benz(a)anthracene	µg/L	0.1				<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a) pyrene	µg/L	0.05				<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	0.1	<0.05
Benzo(b)fluoranthene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1				<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Coronene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1				0.5	<0.1	<0.1	0.5	<0.1	0.4	0.2	1	0.5	1.1
Fluorene	µg/L	0.1				0.2	<0.1	<0.1	0.3	<0.1	<0.1	0.1	0.2	<0.1	1.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	µg/L	0.1				0.2	0.4	0.3	1.4	0.2	0.3	0.2	0.2	0.2	0.5
Perylene	µg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1				1.1	<0.1	0.1	1.1	<0.1	0.3	0.2	1.2	0.5	2.2
Pyrene	µg/L	0.1				0.4	<0.1	<0.1	0.4	0.3	0.4	0.9	2.1	0.4	0.9
CPAH (ESDAT)	µg/L		<7.5	<7.5	<7.5	<0.75	<0.75	<0.75	0.86						
EP075B: Polynuclear Aromatic Hydrocarbons															
2-methylnaphthalene	µg/L	2													
EP075H: Anilines and Benzidines															
Dibenzofuran	µg/L	2	<2	<2	<2										
EK026G: Total Cyanide By Discrete Analyser															
Cyanide Total	mg/L	0.004	<0.004	<0.004	<0.004										
EP080/071: Total Petroleum Hydrocarbons															
TPH C10 - C14	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28	µg/L	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	150
TPH C29-C36	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	150
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft															
>C10 - C16 Fraction	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
>C10 - C40 Fraction (sum)	µg/L	100				<100	<100	<100	<100						
>C16 - C34 Fraction	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.13
>C34 - C40 Fraction	mg/L	0.1				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH C10 - C40 (Sum of total)	µg/L	100	<100	<100	<100					<100	<100	<100	<100	<100	130
EP080/071: Total Petroleum Hydrocarbons															
TPH C6 - C9	µg/L	20	<20	<20	<20										
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft															
TPH C6-C10	mg/L	0.02	<0.02	<0.02	<0.02										
EP080: BTEXN															
Total Xylene (ESDAT)	µg/L	2	<2	<2	<2										
Benzene	µg/L	1	<1	<1	<1										
Ethylbenzene	µg/L	2	<2	<2	<2										
Naphthalene	µg/L	5	<5	<5	<5										
Toluene	µg/L	2	<5	<5	<5										
Xylene (m & p)	µg/L	2	<2	<2	<2										
Xylene (o)	µg/L	2	<2	<2	<2										
EP074A: Monocyclic Aromatic Hydrocarbons															
Benzene	µg/L	1													
Ethylbenzene	µg/L	2													
Styrene	µg/L	5													
Toluene	µg/L	2													
Xylene (m & p)	µg/L	2													
Xylene (o)	µg/L	2													
EG035W: Water Leachable Mercury by FIMS															
Mercury	µg/L	0.1	<0.1	<0.1	<0.1										
EG020W: Water Leachable Metals by ICP-MS															
Arsenic	µg/L	1	<1	<1	2										
Cadmium	µg/L	0.1	0.2	0.2	0.4										
Chromium	µg/L	1	<1	<1	6										
Copper	µg/L	1	2	3	5										
Lead	µg/L	1	<1	<1	5										
Nickel	µg/L	1	2	2	3										
Zinc	mg/L	0.005	0.205	0.292	0.234										

Notes
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
< denotes result less than the LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)f Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Inden c,d)pyrene)
ASLP - Australian Standard Leaching Procedure
TCLP - Total Characteristic Leaching Procedure

Table T7
Leachate Results

		Location_Code	BH413	BH413	BH413
		Sample_Depth_Range	16.400-16.600	4.000-4.200	9.000-9.200
		Field_ID	BH413_16.4-16.6	BH413_4.0-4.2	BH413_9.0-9.2
		Sampled_Date_Time	5/04/2011	1/04/2011	1/04/2011
		SampleCode	ES1107354006	ES1107354002	ES1107354004
		Sample_Type	Normal	Normal	Normal
		Monitoring_Zone	L	L	L
		Method	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**			
EK055G: Ammonia as N by Discrete Analyser					
Ammonia as N	mg/L	0.01	0.3	<0.01	<0.01
ESDAT Combined					
Total Xylene (ESDAT)	µg/L				
TPH C15-C36	mg/L				
TPH+C10 - C36 (Sum of total)	µg/L				
EG035C: Leachable Mercury by FIMS					
Mercury	µg/L	1			
EG005C: Leachable Metals by ICPAES					
Arsenic	µg/L	100			
Cadmium	µg/L	50			
Chromium	µg/L	100			
Copper	µg/L	100			
Lead	µg/L	100			
Nickel	µg/L	100			
Zinc	mg/L	0.1			
EG035W: Water Leachable Mercury by FIMS					
Mercury	µg/L	0.1			
EG020W: Water Leachable Metals by ICP-MS					
Arsenic	µg/L	1			
Cadmium	µg/L	0.1			
Chromium	µg/L	1			
Copper	µg/L	1			
Lead	µg/L	1			
Nickel	µg/L	1			
Zinc	mg/L	0.005			
EP075(SIM)A: Phenolic Compounds					
2,4,5-trichlorophenol	µg/L	1			
2,4,6-trichlorophenol	µg/L	1			
2,4-dichlorophenol	µg/L	1			
2,4-dimethylphenol	µg/L	1			
2,6-dichlorophenol	µg/L	1			
2-chlorophenol	µg/L	1			
2-methylphenol	µg/L	1			
2-nitrophenol	µg/L	1			
3-&4-methylphenol	µg/L	2			
4-chloro-3-methylphenol	µg/L	1			
Pentachlorophenol	µg/L	2			
Phenol	µg/L	1			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons					
Acenaphthene	µg/L	1			
Acenaphthylene	µg/L	1			
Anthracene	µg/L	1			
Benz(a)anthracene	µg/L	1			
Benzo(a) pyrene	µg/L	0.5			
Benzo(b)fluoranthene	µg/L	1			
Benzo(g,h,i)perylene	µg/L	1			
Benzo(k)fluoranthene	µg/L	1			
Chrysene	µg/L	1			
Dibenz(a,h)anthracene	µg/L	1			
Fluoranthene	µg/L	1			
Fluorene	µg/L	1			
Indeno(1,2,3-c,d)pyrene	µg/L	1			
Naphthalene	µg/L	1			
Phenanthrene	µg/L	1			
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5			
Pyrene	µg/L	1			
PAH (ESDAT TOTAL)	µg/L				
EP132A: Phenolic Compounds					
2,3,4,6-tetrachlorophenol	µg/L	0.1	<0.1	<0.1	<0.1
2,4,5-trichlorophenol	µg/L	0.1	<0.1	<0.1	<0.1
2,4,6-trichlorophenol	µg/L	0.1	<0.1	<0.1	<0.1
2,4-dichlorophenol	µg/L	0.1	<0.1	<0.1	<0.1
2,4-dimethylphenol	µg/L	0.1	<0.1	0.2	<0.1
2,6-dichlorophenol	µg/L	0.1	<0.1	<0.1	<0.1
2-chlorophenol	µg/L	0.05	<0.05	<0.05	<0.05
2-methylphenol	µg/L	0.1	<0.1	0.1	<0.1
2-nitrophenol	µg/L	0.1	<0.1	<0.1	<0.1
3-Methylphenol	µg/L	0.1	0.1	0.2	<0.1
4-chloro-3-methylphenol	µg/L	0.05	<0.05	<0.05	0.05
4-methylphenol	mg/L	0.0001	<0.0001	<0.0001	<0.0001
4-nitrophenol	µg/L	0.1	<0.1	<0.1	<0.1
Hexachlorophene	µg/L	0.1	<0.1	<0.1	<0.1
Pentachlorophenol	µg/L	0.05	<0.05	<0.05	<0.05
Phenol	µg/L	0.1	<0.1	0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons					
2-(acetylamino) fluorene	µg/L	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	0.3	<0.1
3-methylcholanthrene	µg/L	0.1	<0.1	<0.1	<0.1
7,12-dimethylbenz(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	0.7	0.1
Acenaphthylene	µg/L	0.1	<0.1	0.3	<0.1
Anthracene	µg/L	0.1	<0.1	0.9	0.1

Table T7
Leachate Results

		Location_Code	BH413	BH413	BH413
		Sample_Depth_Range	16.400-16.600	4.000-4.200	9.000-9.200
		Field_ID	BH413_16.4-16.6	BH413_4.0-4.2	BH413_9.0-9.2
		Sampled_Date_Time	5/04/2011	1/04/2011	1/04/2011
		SampleCode	ES1107354006	ES1107354002	ES1107354004
		Sample_Type	Normal	Normal	Normal
		Monitoring_Zone	L	L	L
		Method	ASLP	ASLP	ASLP
ChemName	**output unit**	**LOR**			
Benz(a)anthracene	µg/L	0.1	<0.1	0.3	0.1
Benzo(a) pyrene	µg/L	0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	0.2	<0.1
Coronene	µg/L	0.1	<0.1	<0.1	<0.1
Dibenz(a,h)anthracene	µg/L	0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	0.3	1.4	0.7
Fluorene	µg/L	0.1	<0.1	1	0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	<0.1
Naphthalene	µg/L	0.1	0.2	1.3	0.6
Perylene	µg/L	0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	0.2	3.1	0.2
Pyrene	µg/L	0.1	0.5	2.7	2.3
CPAH (ESDAT)	µg/L				
EP075B: Polynuclear Aromatic Hydrocarbons					
2-methylnaphthalene	µg/L	2			
EP075H: Anilines and Benzidines					
Dibenzofuran	µg/L	2			
EK026G: Total Cyanide By Discrete Analyser					
Cyanide Total	mg/L	0.004			
EP080/071: Total Petroleum Hydrocarbons					
TPH C10 - C14	µg/L	50	<50	<50	<50
TPH C15-C28	µg/L	100	<100	820	230
TPH C29-C36	µg/L	50	<50	<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50	<50	820	230
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft					
>C10 - C16 Fraction	mg/L	0.1	<0.1	0.16	<0.1
>C10 - C40 Fraction (sum)	µg/L	100			
>C16 - C34 Fraction	mg/L	0.1	<0.1	0.6	0.13
>C34 - C40 Fraction	mg/L	0.1	<0.1	<0.1	<0.1
TPH C10 - C40 (Sum of total)	µg/L	100	<100	760	130
EP080/071: Total Petroleum Hydrocarbons					
TPH C6 - C9	µg/L	20			
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft					
TPH C6-C10	mg/L	0.02			
EP080: BTEXN					
Total Xylene (ESDAT)	µg/L	2			
Benzene	µg/L	1			
Ethylbenzene	µg/L	2			
Naphthalene	µg/L	5			
Toluene	µg/L	2			
Xylene (m & p)	µg/L	2			
Xylene (o)	µg/L	2			
EP074A: Monocyclic Aromatic Hydrocarbons					
Benzene	µg/L	1			
Ethylbenzene	µg/L	2			
Styrene	µg/L	5			
Toluene	µg/L	2			
Xylene (m & p)	µg/L	2			
Xylene (o)	µg/L	2			
EG035W: Water Leachable Mercury by FIMS					
Mercury	µg/L	0.1			
EG020W: Water Leachable Metals by ICP-MS					
Arsenic	µg/L	1			
Cadmium	µg/L	0.1			
Chromium	µg/L	1			
Copper	µg/L	1			
Lead	µg/L	1			
Nickel	µg/L	1			
Zinc	mg/L	0.005			

Notes
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
< denotes result less than the LOR
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)f Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Inden c,d)pyrene)
ASLP - Australian Standard Leaching Procedure
TCLP - Total Characteristic Leaching Procedure

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Table T8
Groundwater Filtrate Results

			Location_Code	BH405	BH405	BH405	BH405	BH405	BH405	BH410	BH410
			Field_ID	IT3S	IT3S FILTRATE	IT3M	IT3M FILTRATE	IT3D	IT3D FILTRATE	IT04S	IT04S
			Well	IT3S	IT3S	IT3M	IT3M	IT3D	IT3D	IT04S	IT04S
			Sampled_Date_Time	25/02/2011	25/02/2011	25/02/2011	25/02/2011	25/02/2011	25/02/2011	19/05/2011	19/05/2011
			SDG	ES1104161	ES1104161	ES1104161	ES1104161	ES1104161	ES1104161	ES1110580	ES1110584
			Sample Type	Standard	Filtrate	Standard	Filtrate	Standard	Filtrate	Standard	Standard
			SampleCode	ES1104161003	ES1104161027	ES1104161004	ES1104161028	ES1104161005	ES1104161029	ES1110580001	ES1110584001
ChemName		**Unit**	**EQL**	**ANZECC (2000) Ecosystems Marine Water (95%)**							
Metals											
	Aluminium (Filtered)	mg/L	0.005		<0.01		0.01		<0.01		<0.01	
	Antimony (Filtered)	mg/L	2E-04		0.0017		0.0021		0.0005		0.0012	
	Arsenic (Filtered)	µg/L	0.2		1.7		0.8		0.7		0.6	
	Barium (Filtered)	mg/L	5E-04		0.096		0.1		0.714		0.063	
	Beryllium (Filtered)	µg/L	0.1		<0.1		<0.1		<0.1		<0.1	
	Cadmium (Filtered)	µg/L	0.05	5.5	0.9		0.4		<0.2		<0.2	
	Chromium (Filtered)	µg/L	0.2	4.4	<0.5		<0.5		<0.5		<0.5	
	Chromium (hexavalent) (Filtered)	mg/L	0.01									<0.01
	Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274								<0.01
	Cobalt (Filtered)	µg/L	0.1	1	0.8		0.3		0.4		0.7	
	Copper (Filtered)	µg/L	0.5	1.3	<1		<1		<1		30	
	Manganese (Filtered)	mg/L	5E-04		0.072		0.0336		0.294		0.0338	
	Mercury (Filtered)	µg/L	0.1	0.1	<0.1		<0.1		<0.1		<0.1	
	Nickel (Filtered)	µg/L	0.5	70	5.4		1.2		<0.5		9.1	
	Selenium (Filtered)	mg/L	2E-04		<0.002		<0.002		<0.002		<0.002	
	Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001		<0.0001		<0.0001		0.0003	
	Vanadium (Filtered)	µg/L	0.2	100	1.9		0.9		0.9		1.2	
	Zinc (Filtered)	mg/L	0.001	0.015	0.017		0.046		<0.005		0.018	
TPH												
	TPH C6 - C9	µg/L	20		<20		<20		2120		<20	
	TPH C10 - C14	µg/L	50		<50		<50		5590		<50	
	TPH C15-C36	mg/L			0.65		<0.15		3.23		<0.15	
	TPH C15-C28	µg/L	100		410		<100		2970		<100	
	TPH C29-C36	µg/L	50		240		<50		260		<50	
	TPH+C10 - C36 (Sum of total)	µg/L	50		650 - 700		<50		8820		<50	
	TPH C10 - C40 (Sum of total)	µg/L	100								<100	
BTEX												
	Total Xylene (ESDAT)	µg/L	2		<4		<4		461		<2	
	Benzene	µg/L	1	700	<1		<1		595		<1	
	Ethylbenzene	µg/L	1		<2		<2		51		<2	
	Toluene	µg/L	1		<5		<5		465		<5	
	Xylene (m & p)	µg/L	2		<2		<2		325		<2	
	Xylene (o)	µg/L	1		<2		<2		136		<2	
PAH/Phenols												
	2,4-dimethylphenol	µg/L	0.1		<1	<0.2	<1	<0.2	360	280	<0.1	
	2,4-dinitrophenol	mg/L	0.03									
	2-methylnaphthalene	µg/L	0.1			<0.1		<0.1		8.2	<0.1	
	2-methylphenol	µg/L	0.1		<1	0.3	<1	<0.2	159	94.2	<0.1	
	2-nitrophenol	µg/L	0.1		<1	<0.2	<1	<0.2	<10	<0.2	<0.1	
	3-&4-methylphenol	µg/L	2		<2		<2		123			
	3-methylcholanthrene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
	3-Methylphenol	µg/L	0.1			0.5		<0.2		43	<0.1	
	4,6-Dinitro-2-methylphenol	µg/L	30									
	4-chloro-3-methylphenol	µg/L	0.05		<1	<0.1	<1	<0.1	<10	<0.1	<0.05	
	4-methylphenol	mg/L	1E-04			<0.0002		<0.0002		0.0218	<0.0001	
	4-nitrophenol	µg/L	0.1			<0.2		<0.2		<0.2	<0.1	
	Acenaphthene	µg/L	0.01		<1	<0.1	<1	<0.1	25	2.1	<0.1	
	Acenaphthylene	µg/L	0.01		<1	<0.1	<1	<0.1	158	10.2	<0.1	
	Anthracene	µg/L	0.01		<1	<0.1	<1	<0.1	25.7	<0.1	<0.1	
	Benz(a)anthracene	µg/L	0.01		2.2	<0.1	<1	<0.1	19.6	<0.1	<0.1	
	Benzo(a) pyrene	µg/L	0.01		3.8	<0.05	<0.5	<0.05	12.8	<0.05	<0.05	
	Benzo(b)&(k)fluoranthene	µg/L	0.05									
	Benzo(b)fluoranthene	µg/L	0.1		4.8	<0.1	<1	<0.1	12.4	<0.1	<0.1	
	Benzo(g,h,i)perylene	µg/L	0.01		3	<0.1	<1	<0.1	<10	<0.1	<0.1	
	Benzo(k)fluoranthene	µg/L	0.1		2.5	<0.1	<1	<0.1	<10	<0.1	<0.1	
	Chrysene	µg/L	0.01		1.4	<0.1	<1	<0.1	11.3	<0.1	<0.1	
	Dibenz(a,h)anthracene	µg/L	0.01		<1	<0.1	<1	<0.1	<10	<0.1	<0.1	
	Fluoranthene	µg/L	0.01		1.9	<0.1	<1	<0.1	28.6	<0.1	<0.1	
	Fluorene	µg/L	0.01		<1	<0.1	<1	<0.1	75.9	0.4	<0.1	
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01		2.2	<0.1	<1	<0.1	<10	<0.1	<0.1	
	Naphthalene	µg/L	0.01	70	<1	0.5	<1	0.2	2560	549	<0.1	
	PAHs (Sum of total)	µg/L	0.05									
	Phenanthrene	µg/L	0.01		<1	<0.1	<1	<0.1	77.7	<0.1	<0.1	
	Phenol	µg/L	0.1	400	<1	1	<1	0.2	<10	6.9	<0.1	
	Pyrene	µg/L	0.01		4.5	<0.1	1	<0.1	41.8	<0.1	<0.1	
	CPAH (ESDAT)	µg/L			20.9	<0.75	<7.5	<0.75	96.1	<0.75	<0.75	
	PAH (ESDAT TOTAL)	µg/L			33.3	1.95	15.5	1.65	3088.8	562.85	<1.55	
Halogenated Phenols												
	2,3,4,6-tetrachlorophenol	µg/L	0.1			<0.2		<0.2		<0.2	<0.1	
	2,4,5-trichlorophenol	µg/L	0.1		<1	<0.2	<1	<0.2	<10	<0.2	<0.1	
	2,4,6-trichlorophenol	µg/L	0.1		<1	<0.2	<1	<0.2	<10	<0.2	<0.1	
	2,4-dichlorophenol	µg/L	0.1		<1	<0.2	<1	<0.2	<10	<0.2	<0.1	
	2,6-dichlorophenol	µg/L	0.1		<1	<0.2	<1	<0.2	<10	<0.2	<0.1	
	2-chlorophenol	µg/L	0.05		<1	<0.1	<1	<0.1	<10	<0.1	<0.05	
	Pentachlorophenol	µg/L	0.05	22	<2	<0.1	<2	<0.1	<20	<0.1	<0.05	
	tetrachlorophenols	µg/L	30									
Herbicides												
	Dinoseb	µg/L	100									
Inorganics												
	Ammonia as N	mg/L	0.01									<0.1
	Cyanide (Free)	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
	Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004		<0.004		<0.004	
	Cyanide (WAD)	mg/L	0.01									
Lead												
	Lead (Filtered)	µg/L	0.1	4.4	0.8		2.4		0.2		0.8	
MAH												
	Styrene	µg/L	5									<5
other												
	Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002	<0.0005	<0.002	<0.0005	<0.02	<0.0005	<0.00025	
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5									
	Total BTEX	mg/L	0.01									
PAH												
	7,12-dimethylbenz(a)anthracene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
Pesticides												
	Pesticides (total, NSW Waste 2008)	mg/L			<0.001	<0.0001	<0.001	<0.0001	<0.01	<0.0001	<0.00005	
Phenolics												
	4,6-Dinitro-o-cyclohexyl phenol	µg/L	100									
	Phenols (Total Halogenated)	mg/L	0.01									
	Phenols (Total Non Halogenated)	mg/L	0.1									
SVOCs												
	2-(acetylamino) fluorene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
	Benzo(e)pyrene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
	Coronene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
	Dibenzofuran	µg/L	2									<2
	Hexachlorophene	µg/L	0.1			<0.2		<0.2		<0.2	<0.1	
	Perylene	µg/L	0.1			<0.1		<0.1		<0.1	<0.1	
	TPH C6-C10	mg/L	0.02								<0.02	
Draft NEPM TPH fractions												
	>C10 - C16 Fraction	mg/L	0.1									
	>C10 - C40 Fraction (sum)	µg/L	100									
	>C16 - C34 Fraction	mg/L	0.1									
	>C34 - C40 Fraction	mg/L	0.1									
	Sum of BTEX	mg/L	0.001									
	C6 - C10 Fraction	mg/L	0.02									
	C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02									

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

			Location_Code	BH410	BH410	BH410	BH410	BH410	BH410	BH410	BH411	BH411	BH411	BH411
			Field_ID	IT04S	IT04M	IT04M	IT04M	IT04D	IT04D	IT04D	IT05S	IT05S	IT05S	IT05M
			Well	IT04S	IT04M	IT04M	IT04M	IT04D	IT04D	IT04D	IT05S	IT05S	IT05S	IT05M
			Sampled_Date_Time	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011
			SDG	ES1110584	ES1110580	ES1110584	ES1110584	ES1110580	ES1110584	ES1110584	ES1110580	ES1110584	ES1110584	ES1110580
			Sample Type	Filtrate	Standard	Standard	Filtrate	Standard	Standard	Filtrate	Standard	Standard	Filtrate	Standard
			SampleCode	ES1110584007	ES1110580002	ES1110584002	ES1110584008	ES1110580003	ES1110584003	ES1110584009	ES1110580004	ES1110584004	ES1110584010	ES1110580005
ChemName	Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)											
Metals														
Aluminium (Filtered)	mg/L	0.005			<0.01			<0.01			0.01			0.01
Antimony (Filtered)	mg/L	2E-04			<0.0005			<0.0005			0.001			<0.0005
Arsenic (Filtered)	µg/L	0.2		0.9	1.5		0.8	<0.5		0.5	1.4		1	1.7
Barium (Filtered)	mg/L	5E-04			0.111			0.114			0.064			0.009
Beryllium (Filtered)	µg/L	0.1			<0.1			<0.1			<0.1			<0.1
Cadmium (Filtered)	µg/L	0.05	5.5	<0.2	<0.2		<0.2	0.3		<0.2	0.3		0.7	<0.2
Chromium (Filtered)	µg/L	0.2	4.4	<0.5	<0.5		<0.5	<0.5		<0.5	<0.5		<0.5	<0.5
Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01		<0.01	<0.01		<0.01	<0.01		<0.01	<0.01	
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274	<0.01		<0.01	<0.01		<0.01	<0.01		<0.01	<0.01	
Cobalt (Filtered)	µg/L	0.1	1	1.1	0.7		1.5	45.5		45.2	0.5		0.8	<0.2
Copper (Filtered)	µg/L	0.5	1.3	24	<1		<1	24		6	<1		2	2
Manganese (Filtered)	mg/L	5E-04			0.182			4.52			0.0126			0.0022
Mercury (Filtered)	µg/L	0.1	0.1	<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Nickel (Filtered)	µg/L	0.5	70	19.1	1		3.2	34.3		33.1	1.3		3.1	<0.5
Selenium (Filtered)	mg/L	2E-04			<0.002			<0.002			<0.002			<0.002
Silver (Filtered)	mg/L	1E-04	0.0014		0.0001			<0.0001			<0.0001			0.0002
Vanadium (Filtered)	µg/L	0.2	100	1	0.8		0.6	<0.5		0.8	1.3		1.2	1.6
Zinc (Filtered)	mg/L	0.001	0.015	0.02	<0.005		<0.005	0.09		0.066	0.036		0.055	0.014
TPH														
TPH C6 - C9	µg/L	20		<20	<20		<20	<20		<20	<20		<20	<20
TPH C10 - C14	µg/L	50		<50	<50		<50	<50		<50	<50		<50	<50
TPH C15-C36	mg/L			<0.15	<0.15		<0.15	<0.15		<0.15	<0.15		<0.15	<0.15
TPH C15-C28	µg/L	100		<100	<100		<100	<100		<100	<100		<100	<100
TPH C29-C36	µg/L	50		<50	<50		<50	<50		<50	<50		<50	<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50		<50	<50		<50	<50		<50	<50
TPH C10 - C40 (Sum of total)	µg/L	100		<100	<100		<100	<100		<100	<100		<100	<100
BTEX														
Total Xylene (ESDAT)	µg/L	2		<2	<2		<2	<2		<2	<2		<2	<2
Benzene	µg/L	1	700	<1	<1		<1	7		3	<1		<1	<1
Ethylbenzene	µg/L	1		2	<2		2	<2		4	<2		2	<2
Toluene	µg/L	1		<5	<5		<5	<5		<5	<5		<5	<5
Xylene (m & p)	µg/L	2		<2	<2		<2	<2		<2	<2		<2	<2
Xylene (o)	µg/L	1		<2	<2		<2	<2		<2	<2		<2	<2
PAH/Phenols														
2,4-dimethylphenol	µg/L	0.1		<0.1	<0.1		<0.1	18.8		8.3	<0.1		<0.1	<0.1
2,4-dinitrophenol	mg/L	0.03												
2-methylnaphthalene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2-methylphenol	µg/L	0.1		<0.1	<0.1		<0.1	5.4		3.5	<0.1		<0.1	<0.1
2-nitrophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
3-&4-methylphenol	µg/L	2												
3-methylcholanthrene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
3-Methylphenol	µg/L	0.1		<0.1	<0.1		<0.1	1.5		1.6	<0.1		<0.1	<0.1
4,6-Dinitro-2-methylphenol	µg/L	30												
4-chloro-3-methylphenol	µg/L	0.05		<0.05	<0.05		<0.05	<0.05		0.07	<0.05		<0.05	<0.05
4-methylphenol	mg/L	1E-04		<0.0001	<0.0001		0.0001	0.0003		0.0003	<0.0001		<0.0001	<0.0001
4-nitrophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Acenaphthene	µg/L	0.01		<0.1	0.2		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Acenaphthylene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Anthracene	µg/L	0.01		<0.1	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Benz(a)anthracene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Benzo(a) pyrene	µg/L	0.01		<0.05	<0.05		<0.05	<0.05		<0.05	<0.05		<0.05	<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05												
Benzo(b)fluoranthene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Chrysene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Fluoranthene	µg/L	0.01		<0.1	0.3		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Fluorene	µg/L	0.01		<0.1	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Naphthalene	µg/L	0.01	70	<0.1	<5 - 0.2		<0.1	<5 - 4.3		<5 - 0.5	<0.1		<0.1	<0.1
PAHs (Sum of total)	µg/L	0.05												
Phenanthrene	µg/L	0.01		<0.1	0.5		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Phenol	µg/L	0.1	400	<0.1	<0.1		0.4	0.2		0.6	<0.1		0.3	<0.1
Pyrene	µg/L	0.01		<0.1	0.4		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
CPAH (ESDAT)	µg/L			<0.75	<0.75		<0.75	<0.75		<0.75	<0.75		<0.75	<0.75
PAH (ESDAT TOTAL)	µg/L			<1.55	2.65		<1.55	5.75		1.95	<1.55		<1.55	<1.55
Halogenated Phenols														
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2,4,5-trichlorophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2,4,6-trichlorophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2,4-dichlorophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2,6-dichlorophenol	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
2-chlorophenol	µg/L	0.05		<0.05	<0.05		<0.05	<0.05		<0.05	<0.05		<0.05	<0.05
Pentachlorophenol	µg/L	0.05	22	<0.05	<0.05		<0.05	<0.05		<0.05	<0.05		<0.05	<0.05
tetrachlorophenols	µg/L	30												
Herbicides														
Dinoseb	µg/L	100												
Inorganics														
Ammonia as N	mg/L	0.01		<0.1		1.24	1.15		1.21	1.28		<0.1	<0.1	
Cyanide (Free)	mg/L	0.004		<0.004	<0.004		<0.004	<0.004		<0.004	<0.004		<0.004	<0.004
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004	0.006		<0.004	<0.008		<0.004	<0.004		<0.004	<0.004
Cyanide (WAD)	mg/L	0.01												
Lead														
Lead (Filtered)	µg/L	0.1	4.4	0.6	<0.2		<0.2	<0.2		<0.2	0.5		1	0.6
MAH														
Styrene	µg/L	5		<5		<5	<5		<5	<5		<5	<5	
other														
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.00025	<0.00025		<0.00025	<0.00025		<0.00025	<0.00025		<0.00025	<0.00025
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5												
Total BTEX	mg/L	0.01												
PAH														
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Pesticides														
Pesticides (total, NSW Waste 2008)	mg/L			<0.00005	<0.00005		<0.00005	<0.00005		0.00007	<0.00005		<0.00005	<0.00005
Phenolics														
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100												
Phenols (Total Halogenated)	mg/L	0.01												
Phenols (Total Non Halogenated)	mg/L	0.1												
SVOCs														
2-(acetylamino) fluorene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Benzo(e)pyrene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Coronene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Dibenzofuran	µg/L	2		<2		<2	<2		<2	<2		<2	<2	
Hexachlorophene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
Perylene	µg/L	0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1
TPH C6-C10	mg/L	0.02		<0.02	<0.02		<0.02	<0.02		<0.02	<0.02		<0.02	<0.02
Draft NEPM TPH fractions														
>C10 - C16 Fraction	mg/L	0.1												
>C10 - C40 Fraction (sum)	µg/L	100												
>C16 - C34 Fraction	mg/L	0.1												
>C34 - C40 Fraction	mg/L	0.1												
Sum of BTEX	mg/L	0.001												
C6 - C10 Fraction	mg/L	0.02												
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02												

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

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Table T8
Groundwater Filtrate Results

			Location_Code	BH411	BH411	BH411	BH411	BH411	BH412	BH412	BH412	BH412	BH412
			Field_ID	IT05M	IT05M	IT05D	IT05D	IT05D	IT06_SHALLOW	IT06_Shallow	IT06_Shallow_Filtrate	IT06_MID	IT06_Mid
			Well	IT05M	IT05M	IT05D	IT05D	IT05D	IT06	IT06	IT06	IT06	IT06
			Sampled_Date_Time	19/05/2011	19/05/2011	19/05/2011	19/05/2011	19/05/2011	20/04/2011	20/04/2011	27/04/2011	20/04/2011	20/04/2011
			SDG	ES1110584	ES1110584	ES1110580	ES1110584	ES1110584	ES1108478	ES1108663	ES1108663	ES1108478	ES1108663
			Sample Type	Standard	Filtrate	Standard	Standard	Filtrate	Standard	Standard	Filtrate	Standard	Standard
			SampleCode	ES1110584005	ES1110584011	ES1110580006	ES1110584006	ES1110584012	ES1108478004	ES1108663004	ES1108663022	ES1108478005	ES1108663005
ChemName	Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)										
Metals													
Aluminium (Filtered)	mg/L	0.005				9.09			<0.01			0.01	
Antimony (Filtered)	mg/L	2E-04				<0.0005			<0.0005			0.0006	
Arsenic (Filtered)	µg/L	0.2			1.8	14.7		12.8	1.1			0.9	
Barium (Filtered)	mg/L	5E-04				0.037			0.152			0.05	
Beryllium (Filtered)	µg/L	0.1				13.9			<0.1			<0.1	
Cadmium (Filtered)	µg/L	0.05	5.5		<0.2	0.7		0.4	<0.2			<0.2	
Chromium (Filtered)	µg/L	0.2	4.4		<0.5	<0.5		0.8	<0.5			<0.5	
Chromium (hexavalent) (Filtered)	mg/L	0.01		<0.01	<0.01		<0.01	<0.01					
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274	<0.01	<0.01		<0.01	<0.01					
Cobalt (Filtered)	µg/L	0.1	1		0.2	145		146	1.5			0.6	
Copper (Filtered)	µg/L	0.5	1.3		2	<1		4	<1			<1	
Manganese (Filtered)	mg/L	5E-04				7.38			0.244			0.0438	
Mercury (Filtered)	µg/L	0.1	0.1		<0.1	<0.1		<0.1	<0.1			<0.1	
Nickel (Filtered)	µg/L	0.5	70		0.6	171		173	1.8			<0.5	
Selenium (Filtered)	mg/L	2E-04				0.005			<0.002			<0.002	
Silver (Filtered)	mg/L	1E-04	0.0014			0.0002			<0.0001			<0.0001	
Vanadium (Filtered)	µg/L	0.2	100		1.7	2		0.8	1.2			0.6	
Zinc (Filtered)	mg/L	0.001	0.015		0.036	0.456		0.451	<0.005			0.007	
TPH													
TPH C6 - C9	µg/L	20			<20	90		30	<20		<20	<20	
TPH C10 - C14	µg/L	50			<50	120		<50	<50		<50	<50	
TPH C15-C36	mg/L				<0.15	<0.15		<0.15	0.94		<0.15	0.76	
TPH C15-C28	µg/L	100			<100	<100		<100	690		<100	470	
TPH C29-C36	µg/L	50			<50	<50		<50	250		<50	290	
TPH+C10 - C36 (Sum of total)	µg/L	50			<50	120 - 270		<50	940 - 990		<50	760 - 810	
TPH C10 - C40 (Sum of total)	µg/L	100			<100	100		<100			<100		
BTEX													
Total Xylene (ESDAT)	µg/L	2			<2	17		3 - 5	<2			<2	
Benzene	µg/L	1	700		<1	34		18	<1			<1	
Ethylbenzene	µg/L	1			3	<2		3	<2			<2	
Toluene	µg/L	1			<5	8		<5	9			<5	
Xylene (m & p)	µg/L	2			<2	12		3	<2			<2	
Xylene (o)	µg/L	1			<2	5		<2	<2			<2	
PAH/Phenols													
2,4-dimethylphenol	µg/L	0.1			<0.1	12.8		7.3	<1		<0.1	<1	
2,4-dinitrophenol	mg/L	0.03											
2-methylnaphthalene	µg/L	0.1			<0.1	1.3		0.1		<0.1	<0.1		<0.1
2-methylphenol	µg/L	0.1			<0.1	2.1		1.9	<1	0.2	<0.1	<1	<0.1
2-nitrophenol	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	<1	
3-&4-methylphenol	µg/L	2							<2			<2	
3-methylcholanthrene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
3-Methylphenol	µg/L	0.1			<0.1	<0.1		<0.1		0.1	<0.1		<0.1
4,6-Dinitro-2-methylphenol	µg/L	30											
4-chloro-3-methylphenol	µg/L	0.05			<0.05	<0.05		<0.05	<1		<0.05	<1	
4-methylphenol	mg/L	1E-04			<0.0001	<0.0001		<0.0001		0.0002	<0.0001		<0.0001
4-nitrophenol	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Acenaphthene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	<1	
Acenaphthylene	µg/L	0.01			<0.1	0.1		<0.1	<1		<0.1	<1	
Anthracene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	1.5	
Benz(a)anthracene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	3	
Benzo(a) pyrene	µg/L	0.01			<0.05	<0.05		<0.05	1.2		<0.05	3.4	
Benzo(b)&(k)fluoranthene	µg/L	0.05											
Benzo(b)fluoranthene	µg/L	0.1			<0.1	<0.1		<0.1	1.3		<0.1	3.5	
Benzo(g,h,i)perylene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	2	
Benzo(k)fluoranthene	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	1.6	
Chrysene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	3.2	
Dibenz(a,h)anthracene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	<1	
Fluoranthene	µg/L	0.01			<0.1	<0.1		<0.1	1.8		<0.1	6.6	
Fluorene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	<1	
Indeno(1,2,3-c,d)pyrene	µg/L	0.01			<0.1	<0.1		<0.1	<1		<0.1	1.6	
Naphthalene	µg/L	0.01	70		<0.1	64 - 80.2		<5 - 6	<5 - 1		<0.1	<1	
PAHs (Sum of total)	µg/L	0.05											
Phenanthrene	µg/L	0.01			<0.1	<0.1		0.2	1.2		<0.1	4.3	
Phenol	µg/L	0.1	400		0.2	<0.1		0.5	<1		0.6	<1	
Pyrene	µg/L	0.01			<0.1	<0.1		<0.1	2.5		<0.1	7.8	
CPAH (ESDAT)	µg/L				<0.75	<0.75		<0.75	8.5		<0.75	19.3	
PAH (ESDAT TOTAL)	µg/L				<1.55	81.6499999999999		7.55	19		<1.55	43.5	
Halogenated Phenols													
2,3,4,6-tetrachlorophenol	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
2,4,5-trichlorophenol	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	<1	
2,4,6-trichlorophenol	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	<1	
2,4-dichlorophenol	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	<1	
2,6-dichlorophenol	µg/L	0.1			<0.1	<0.1		<0.1	<1		<0.1	<1	
2-chlorophenol	µg/L	0.05			<0.05	<0.05		<0.05	<1		<0.05	<1	
Pentachlorophenol	µg/L	0.05	22		<0.05	<0.05		<0.05	<2		<0.05	<2	
tetrachlorophenols	µg/L	30											
Herbicides													
Dinoseb	µg/L	100											
Inorganics													
Ammonia as N	mg/L	0.01		<0.1	<0.1		2.47	2.23		2.34	2.84		<0.1
Cyanide (Free)	mg/L	0.004			<0.004	<0.004		<0.004	<0.004			<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004			<0.004	<0.004		<0.004	<0.004		<0.004	<0.004	
Cyanide (WAD)	mg/L	0.01											
Lead													
Lead (Filtered)	µg/L	0.1	4.4		<0.2	8		15.3	0.2			0.6	
MAH													
Styrene	µg/L	5		<5	<5		<5	<5					
other													
Scheduled chemicals (NSW Waste 2008)	mg/L				<0.00025	<0.00025		<0.00025	<0.002		<0.00025	<0.002	
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5							9			38.5	
Total BTEX	mg/L	0.01											
PAH													
7,12-dimethylbenz(a)anthracene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Pesticides													
Pesticides (total, NSW Waste 2008)	mg/L				<0.00005	<0.00005		<0.00005	<0.001		<0.00005	<0.001	
Phenolics													
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100											
Phenols (Total Halogenated)	mg/L	0.01											
Phenols (Total Non Halogenated)	mg/L	0.1											
SVOCs													
2-(acetylamino) fluorene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Benzo(e)pyrene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Coronene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Dibenzofuran	µg/L	2		<2	<2		<2	<2					
Hexachlorophene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
Perylene	µg/L	0.1			<0.1	<0.1		<0.1			<0.1		
TPH C6-C10	mg/L	0.02			<0.02	0.09		0.03			<0.02		
Draft NEPM TPH fractions													
>C10 - C16 Fraction	mg/L	0.1							<0.1			<0.1	
>C10 - C40 Fraction (sum)	µg/L	100							960			830	
>C16 - C34 Fraction	mg/L	0.1							0.83			0.67	
>C34 - C40 Fraction	mg/L	0.1							0.13			0.16	
Sum of BTEX	mg/L	0.001							0.009			<0.001	
C6 - C10 Fraction	mg/L	0.02							<0.02			<0.02	
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02							<0.02			<0.02	

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

	Location_Code	BH412	BH412	BH412	BH412	BH413	BH413	BH413	BH413	BH413	BH413
	Field_ID	IT06_Mid_Filtrate	IT06_DEEP	IT06_Deep	IT06_Deep_Filtrate	IT07_SHALLOW	IT07_Shallow	IT07_Shallow_Filtrate	IT07_MID	IT07_Mid	IT07_Mid_Filtrate
	Well	IT06	IT06	IT06	IT06	IT07	IT07	IT07	IT07	IT07	IT07
	Sampled_Date_Time	27/04/2011	20/04/2011	20/04/2011	27/04/2011	19/04/2011	19/04/2011	27/04/2011	19/04/2011	19/04/2011	27/04/2011
	SDG	ES1108663	ES1108478	ES1108663	ES1108663	ES1108478	ES1108663	ES1108663	ES1108478	ES1108663	ES1108663
	Sample Type	Filtrate	Standard	Standard	Filtrate	Standard	Standard	Filtrate	Standard	Standard	Filtrate
	SampleCode	ES1108663023	ES1108478006	ES1108663006	ES1108663024	ES1108478001	ES1108663001	ES1108663019	ES1108478002	ES1108663002	ES1108663020
ChemName	Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)								
Metals											
Aluminium (Filtered)	mg/L	0.005			1.59			0.01			0.02			
Antimony (Filtered)	mg/L	2E-04			<0.0002			0.0026			0.0019			
Arsenic (Filtered)	µg/L	0.2			2.2			1.6			1.6			
Barium (Filtered)	mg/L	5E-04			0.0901			0.068			0.049			
Beryllium (Filtered)	µg/L	0.1			1.6			<0.1			<0.1			
Cadmium (Filtered)	µg/L	0.05	5.5		0.13			0.4			<0.2			
Chromium (Filtered)	µg/L	0.2	4.4		0.3			<0.5			<0.5			
Chromium (hexavalent) (Filtered)	mg/L	0.01												
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274											
Cobalt (Filtered)	µg/L	0.1	1		17.5			14.1			2.4			
Copper (Filtered)	µg/L	0.5	1.3		<0.5			4			<1			
Manganese (Filtered)	mg/L	5E-04			2.05			0.0419			0.0465			
Mercury (Filtered)	µg/L	0.1	0.1		<0.1			<0.1			<0.1			
Nickel (Filtered)	µg/L	0.5	70		27.3			9.3			2.2			
Selenium (Filtered)	mg/L	2E-04			0.0008			<0.002			<0.002			
Silver (Filtered)	mg/L	1E-04	0.0014		<0.0001			0.0001			0.0001			
Vanadium (Filtered)	µg/L	0.2	100		1.5			1			0.8			
Zinc (Filtered)	mg/L	0.001	0.015		0.167			0.027			0.01			
TPH											
TPH C6 - C9	µg/L	20		<20	<20		<20	70		<20	<20			20
TPH C10 - C14	µg/L	50		<50	<50		<50	<50		<50	<50			<50
TPH C15-C36	mg/L			<0.15	<0.15		<0.15	2.47		<0.15	1.34			<0.15
TPH C15-C28	µg/L	100		<100	<100		<100	1410		<100	900			<100
TPH C29-C36	µg/L	50		<50	<50		<50	1060		<50	440			<50
TPH+C10 - C36 (Sum of total)	µg/L	50		<50	<50		<50	2470 - 2520		<50	1340 - 1390			<50
TPH C10 - C40 (Sum of total)	µg/L	100		<100			<100			<100				<100
BTEX											
Total Xylene (ESDAT)	µg/L	2		<2	<2			<2			<2			
Benzene	µg/L	1	700	<1	<1			<1			<1			
Ethylbenzene	µg/L	1		<2	<2			<2			<2			
Toluene	µg/L	1		7	39			<5			<5			
Xylene (m & p)	µg/L	2		<2	<2			<2			<2			
Xylene (o)	µg/L	1		<2	<2			<2			<2			
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
2,4-dinitrophenol	mg/L	0.03												
2-methylnaphthalene	µg/L	0.1		<0.1		<0.1	<0.1		<0.1	<0.1			<0.1	<0.1
2-methylphenol	µg/L	0.1		0.1	<1	<0.1	0.2	<1	0.6	0.8	<1		<0.1	<0.1
2-nitrophenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
3-&4-methylphenol	µg/L	2			<2			<2			<2			
3-methylcholanthrene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
3-Methylphenol	µg/L	0.1		<0.1		<0.1	<0.1		<0.1	<0.1			<0.1	<0.1
4,6-Dinitro-2-methylphenol	µg/L	30												
4-chloro-3-methylphenol	µg/L	0.05		<0.05	<1		<0.05	<1		<0.05	<1			<0.05
4-methylphenol	mg/L	1E-04		0.0001		<0.0001	0.0002		<0.0001	<0.0001			<0.0001	0.0001
4-nitrophenol	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Acenaphthene	µg/L	0.01		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
Acenaphthylene	µg/L	0.01		<0.1	<1		<0.1	3.2		<0.1	2.3			<0.1
Anthracene	µg/L	0.01		<0.1	<1		<0.1	3.8		<0.1	3			<0.1
Benz(a)anthracene	µg/L	0.01		<0.1	<1		<0.1	10.9		<0.1	6.8			<0.1
Benzo(a) pyrene	µg/L	0.01		<0.05	<0.5		<0.05	12.7		<0.05	8.2			<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05												
Benzo(b)fluoranthene	µg/L	0.1		<0.1	<1		<0.1	15		<0.1	9.1			<0.1
Benzo(g,h,i)perylene	µg/L	0.01		<0.1	<1		<0.1	8.9		<0.1	4.7			<0.1
Benzo(k)fluoranthene	µg/L	0.1		<0.1	<1		<0.1	5.7		<0.1	3.6			<0.1
Chrysene	µg/L	0.01		<0.1	<1		<0.1	8.9		<0.1	6.2			<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<0.1	<1		<0.1	1.7		<0.1	1.2			<0.1
Fluoranthene	µg/L	0.01		<0.1	<1		<0.1	17.7		<0.1	12.8			<0.1
Fluorene	µg/L	0.01		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1	<1		<0.1	6.4		<0.1	4.1			<0.1
Naphthalene	µg/L	0.01	70	0.3	<1		0.3	<1		0.2	<5 - 1.2			0.2
PAHs (Sum of total)	µg/L	0.05												
Phenanthrene	µg/L	0.01		<0.1	<1		<0.1	6		<0.1	5.2			<0.1
Phenol	µg/L	0.1	400	1	<1		1.8	<1		1	<1			0.6
Pyrene	µg/L	0.01		<0.1	<1		<0.1	21.7		<0.1	19.7			<0.1
CPAH (ESDAT)	µg/L			<0.75	<7.5		<0.75	70.2		<0.75	43.9			<0.75
PAH (ESDAT TOTAL)	µg/L			1.75	<15.5		1.75	125.6		1.65	90.1			1.65
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
2,4,5-trichlorophenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
2,4,6-trichlorophenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
2,4-dichlorophenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
2,6-dichlorophenol	µg/L	0.1		<0.1	<1		<0.1	<1		<0.1	<1			<0.1
2-chlorophenol	µg/L	0.05		<0.05	<1		<0.05	<1		<0.05	<1			<0.05
Pentachlorophenol	µg/L	0.05	22	<0.05	<2		<0.05	<2		<0.05	<2			<0.05
tetrachlorophenols	µg/L	30												
Herbicides											
Dinoseb	µg/L	100												
Inorganics											
Ammonia as N	mg/L	0.01		0.46		1.42	1.78							
Cyanide (Free)	mg/L	0.004			<0.004			<0.004			<0.004			
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004	<0.004		<0.004	<0.004		<0.004	<0.004			<0.004
Cyanide (WAD)	mg/L	0.01												
Lead											
Lead (Filtered)	µg/L	0.1	4.4		6.4			2.8			0.9			
MAH											
Styrene	µg/L	5												
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.00025	<0.002		<0.00025	<0.002		<0.00025	<0.002			<0.00025
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5			<0.5			123			88.1			
Total BTEX	mg/L	0.01												
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.00005	<0.001		<0.00005	<0.001		<0.00005	<0.001			<0.00005
Phenolics											
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100												
Phenols (Total Halogenated)	mg/L	0.01												
Phenols (Total Non Halogenated)	mg/L	0.1												
SVOCs											
2-(acetylamino) fluorene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Benzo(e)pyrene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Coronene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Dibenzofuran	µg/L	2												
Hexachlorophene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
Perylene	µg/L	0.1		<0.1			<0.1			<0.1				<0.1
TPH C6-C10	mg/L	0.02		<0.02			<0.02			<0.02				<0.02
Draft NEPM TPH fractions											
>C10 - C16 Fraction	mg/L	0.1			<0.1			<0.1			<0.1			
>C10 - C40 Fraction (sum)	µg/L	100			<100			2840			1420			
>C16 - C34 Fraction	mg/L	0.1			<0.1			2.06			1.17			
>C34 - C40 Fraction	mg/L	0.1			<0.1			0.78			0.25			
Sum of BTEX	mg/L	0.001			0.007			0.039			<0.001			
C6 - C10 Fraction	mg/L	0.02			<0.02			0.07			<0.02			
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02			<0.02			0.03			<0.02			

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

			Location_Code	BH413	BH413	BH413	AECOM_BH69	AECOM_BH69	BH046	BH046	BH198
			Field_ID	IT07_DEEP	IT07_Deep	IT07_Deep_Filtrate	MW69	MW_69 FILTRATE	MW08	MW08 FILTRATE	MW198
			Well	IT07	IT07	IT07	MW69	MW69	MW08	MW08	MW198
			Sampled_Date_Time	19/04/2011	20/04/2011	27/04/2011	25/02/2011	25/02/2011	28/02/2011	28/02/2011	25/02/2011
			SDG	ES1108478	ES1108663	ES1108663	ES1104161	ES1104161	ES1104220	ES1104220	ES1104161
			Sample Type	Standard	Standard	Filtrate	Standard	Filtrate	Standard	Filtrate	Standard
			SampleCode	ES1108478003	ES1108663003	ES1108663021	ES1104161001	ES1104161025	ES1104220002	ES1104220016	ES1104161006
ChemName	Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)								
Metals											
Aluminium (Filtered)	mg/L	0.005		0.01			0.01		0.03		0.021
Antimony (Filtered)	mg/L	2E-04		<0.0005			<0.0005		0.0008		<0.0002
Arsenic (Filtered)	µg/L	0.2		2.4			0.6		8.2		3.8
Barium (Filtered)	mg/L	5E-04		0.189			0.123		1.67		0.0525
Beryllium (Filtered)	µg/L	0.1		<0.1			<0.1		<0.1		<0.1
Cadmium (Filtered)	µg/L	0.05	5.5	<0.2			<0.2		0.2		1
Chromium (Filtered)	µg/L	0.2	4.4	<0.5			<0.5		<0.5		1.1
Chromium (hexavalent) (Filtered)	mg/L	0.01									
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274								
Cobalt (Filtered)	µg/L	0.1	1	1.9			0.3		0.5		0.6
Copper (Filtered)	µg/L	0.5	1.3	<1			<1		<1		<0.5
Manganese (Filtered)	mg/L	5E-04		0.254			0.168		0.235		0.103
Mercury (Filtered)	µg/L	0.1	0.1	<0.1			<0.1		<0.1		<0.1
Nickel (Filtered)	µg/L	0.5	70	2.2			<0.5		9.5		69.1
Selenium (Filtered)	mg/L	2E-04		<0.002			<0.002		<0.002		<0.0002
Silver (Filtered)	mg/L	1E-04	0.0014	0.0002			<0.0001		<0.0001		<0.0001
Vanadium (Filtered)	µg/L	0.2	100	3.1			<0.5		1.5		0.7
Zinc (Filtered)	mg/L	0.001	0.015	0.006			0.012		0.006		0.008
TPH											
TPH C6 - C9	µg/L	20		<20		20	210		<20		<20
TPH C10 - C14	µg/L	50		<50		<50	530		560		<50
TPH C15-C36	mg/L			0.46		<0.15	0.38		2.27		<0.15
TPH C15-C28	µg/L	100		230		<100	330		2110		<100
TPH C29-C36	µg/L	50		230		<50	<50		160		<50
TPH+C10 - C36 (Sum of total)	µg/L	50		460 - 510		<50	860 - 910		2830		<50
TPH C10 - C40 (Sum of total)	µg/L	100				<100					
BTEX											
Total Xylene (ESDAT)	µg/L	2		<2			26		4		<4
Benzene	µg/L	1	700	<1			52		6		<1
Ethylbenzene	µg/L	1		<2			16		2		<2
Toluene	µg/L	1		<5			9		<5		<5
Xylene (m & p)	µg/L	2		<2			13		2		<2
Xylene (o)	µg/L	1		<2			13		2		<2
PAH/Phenols											
2,4-dimethylphenol	µg/L	0.1		<1		<0.1	<5	0.3	16.4	17.9	<1
2,4-dinitrophenol	mg/L	0.03									
2-methylnaphthalene	µg/L	0.1			<0.1	3.1		<0.1		0.3	
2-methylphenol	µg/L	0.1		<1	<0.1	0.2	<5	0.3	15	22.2	<1
2-nitrophenol	µg/L	0.1		<1		<0.1	<5	<0.2	<1	<0.2	<1
3-&4-methylphenol	µg/L	2		<2			<10		10.4		<2
3-methylcholanthrene	µg/L	0.1				<0.1		<0.1		<0.1	
3-Methylphenol	µg/L	0.1			<0.1	<0.1		0.5		14.5	
4,6-Dinitro-2-methylphenol	µg/L	30									
4-chloro-3-methylphenol	µg/L	0.05		<1		0.05	<5	<0.1	<1	0.11	<1
4-methylphenol	mg/L	1E-04			<0.0001	0.0002		<0.0002		0.0019	
4-nitrophenol	µg/L	0.1				<0.1		<0.2		<0.2	
Acenaphthene	µg/L	0.01		<1		0.4	11.7	<0.1	2.1	0.7	<1
Acenaphthylene	µg/L	0.01		<1		1.8	37.2	<0.1	<1	0.3	1.4
Anthracene	µg/L	0.01		<1		1.1	8.9	<0.1	1.9	0.4	<1
Benz(a)anthracene	µg/L	0.01		2		1	<5	<0.1	<1	<0.1	<1
Benzo(a) pyrene	µg/L	0.01		2.3		0.63	<5	<0.05	<0.5	<0.05	<0.5
Benzo(b)&(k)fluoranthene	µg/L	0.05									
Benzo(b)fluoranthene	µg/L	0.1		2.1		0.4	<5	<0.1	<1	<0.1	<1
Benzo(g,h,i)perylene	µg/L	0.01		1.4		0.1	<5	<0.1	<1	<0.1	<1
Benzo(k)fluoranthene	µg/L	0.1		1.5		0.4	<5	<0.1	<1	<0.1	<1
Chrysene	µg/L	0.01		1.8		0.9	<5	<0.1	<1	<0.1	<1
Dibenz(a,h)anthracene	µg/L	0.01		<1		0.1	<5	<0.1	<1	<0.1	<1
Fluoranthene	µg/L	0.01		4.2		1.6	7.4	<0.1	<1	<0.1	<1
Fluorene	µg/L	0.01		<1		1.7	5.7	<0.1	2.2	<0.1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		1.2		0.2	<5	<0.1	<1	<0.1	<1
Naphthalene	µg/L	0.01	70	<1		4	202	5	7.9	9.7	<1
PAHs (Sum of total)	µg/L	0.05									
Phenanthrene	µg/L	0.01		1.8		4.3	32	<0.1	3.1	<0.1	<1
Phenol	µg/L	0.1	400	<1		1.6	<5	0.5	<1	2.3	<1
Pyrene	µg/L	0.01		4.6		2.1	15.1	<0.1	<1	<0.1	<1
CPAH (ESDAT)	µg/L			13.3		3.73	<40	<0.75	<7.5	<0.75	<7.5
PAH (ESDAT TOTAL)	µg/L			28.9		20.73	360	6.45	27.7	12.25	15.9
Halogenated Phenols											
2,3,4,6-tetrachlorophenol	µg/L	0.1				<0.1		<0.2		<0.2	
2,4,5-trichlorophenol	µg/L	0.1		<1		<0.1	<5	<0.2	<1	<0.2	<1
2,4,6-trichlorophenol	µg/L	0.1		<1		<0.1	<5	<0.2	<1	<0.2	<1
2,4-dichlorophenol	µg/L	0.1		<1		<0.1	<5	<0.2	<1	<0.2	<1
2,6-dichlorophenol	µg/L	0.1		<1		<0.1	<5	<0.2	<1	0.5	<1
2-chlorophenol	µg/L	0.05		<1		<0.05	<5	<0.1	<1	0.57	<1
Pentachlorophenol	µg/L	0.05	22	<2		<0.05	<10	<0.1	<2	<0.1	<2
tetrachlorophenols	µg/L	30									
Herbicides											
Dinoseb	µg/L	100									
Inorganics											
Ammonia as N	mg/L	0.01									
Cyanide (Free)	mg/L	0.004		<0.004			<0.004		<0.004		<0.004
Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004	<0.004		<0.004		<0.004
Cyanide (WAD)	mg/L	0.01									
Lead											
Lead (Filtered)	µg/L	0.1	4.4	0.5			<0.2		<0.2		<0.1
MAH											
Styrene	µg/L	5									
other											
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002		<0.00025	<0.01	<0.0005	<0.002	<0.0005	<0.002
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5		22.9							
Total BTEX	mg/L	0.01									
PAH											
7,12-dimethylbenz(a)anthracene	µg/L	0.1				<0.1		<0.1		<0.1	
Pesticides											
Pesticides (total, NSW Waste 2008)	mg/L			<0.001		0.00005	<0.005	<0.0001	<0.001	0.00011	<0.001
Phenolics											
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100									
Phenols (Total Halogenated)	mg/L	0.01									
Phenols (Total Non Halogenated)	mg/L	0.1									
SVOCs											
2-(acetylamino) fluorene	µg/L	0.1				<0.1		<0.1		<0.1	
Benzo(e)pyrene	µg/L	0.1				0.3		<0.1		<0.1	
Coronene	µg/L	0.1				<0.1		<0.1		<0.1	
Dibenzofuran	µg/L	2									
Hexachlorophene	µg/L	0.1				<0.1		<0.2		<0.2	
Perylene	µg/L	0.1				0.2		<0.1		<0.1	
TPH C6-C10	mg/L	0.02				<0.02					
Draft NEPM TPH fractions											
>C10 - C16 Fraction	mg/L	0.1		<0.1							
>C10 - C40 Fraction (sum)	µg/L	100		540							
>C16 - C34 Fraction	mg/L	0.1		0.38							
>C34 - C40 Fraction	mg/L	0.1		0.16							
Sum of BTEX	mg/L	0.001		<0.001							
C6 - C10 Fraction	mg/L	0.02		<0.02							
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02		<0.02							

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

			Location_Code	BH198	BH200	BH200	BH204	BH204	BH209	BH209
			Field_ID	MW198 FILTRATE	MW200	MW200 FILTRATE	MW204S	MW204 FILTRATE	MW209	MW209 FILTRATE
			Well	MW198	MW200	MW200	MW204S	MW204S	MW209	MW209
			Sampled_Date_Time	25/02/2011	28/02/2011	28/02/2011	25/02/2011	25/02/2011	28/02/2011	28/02/2011
			SDG	ES1104161	ES1104220	ES1104220	ES1104220	ES1104220	ES1104220	ES1104220
			Sample Type	Filtrate	Standard	Filtrate	Standard	Filtrate	Standard	Filtrate
			SampleCode	ES1104161030	ES1104220004	ES1104220018	ES1104220001	ES1104220015	ES1104220003	ES1104220017
ChemName	Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)							
Metals										
Aluminium (Filtered)	mg/L	0.005			0.014		0.05		0.01	
Antimony (Filtered)	mg/L	2E-04			<0.0002		0.0005		<0.0005	
Arsenic (Filtered)	µg/L	0.2			5.3		2		1.1	
Barium (Filtered)	mg/L	5E-04			0.0854		0.0854		0.048	
Beryllium (Filtered)	µg/L	0.1			<0.1		<0.1		0.1	
Cadmium (Filtered)	µg/L	0.05	5.5		0.11		0.78		0.5	
Chromium (Filtered)	µg/L	0.2	4.4		0.9		1		<0.5	
Chromium (hexavalent) (Filtered)	mg/L	0.01								
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274							
Cobalt (Filtered)	µg/L	0.1	1		1.5		1.2		0.3	
Copper (Filtered)	µg/L	0.5	1.3		<0.5		3.1		<1	
Manganese (Filtered)	mg/L	5E-04			0.85		0.099		0.018	
Mercury (Filtered)	µg/L	0.1	0.1		0.2		<0.1		<0.1	
Nickel (Filtered)	µg/L	0.5	70		46.4		72.1		55.7	
Selenium (Filtered)	mg/L	2E-04			0.0013		0.0005		<0.002	
Silver (Filtered)	mg/L	1E-04	0.0014		<0.0001		<0.0001		0.0003	
Vanadium (Filtered)	µg/L	0.2	100		2.8		4.7		1	
Zinc (Filtered)	mg/L	0.001	0.015		0.008		0.019		0.006	
TPH										
TPH C6 - C9	µg/L	20			37,600		2380		100	
TPH C10 - C14	µg/L	50			47,400		8430		100	
TPH C15-C36	mg/L				17.25		2.82		0.27	
TPH C15-C28	µg/L	100			17,200		2690		220	
TPH C29-C36	µg/L	50			<50		130		<50	
TPH+C10 - C36 (Sum of total)	µg/L	50			64,600 - 64,650		11,200 - 11,250		320 - 370	
TPH C10 - C40 (Sum of total)	µg/L	100								
BTEX										
Total Xylene (ESDAT)	µg/L	2			1910		695		18	
Benzene	µg/L	1	700		17,900		237		56	
Ethylbenzene	µg/L	1			659		169		15	
Toluene	µg/L	1			1660		440		5	
Xylene (m & p)	µg/L	2			1350		466		8	
Xylene (o)	µg/L	1			560		229		10	
PAH/Phenols										
2,4-dimethylphenol	µg/L	0.1		<0.2	8690	3180	61.4	56.6	1.2	0.4
2,4-dinitrophenol	mg/L	0.03								
2-methylnaphthalene	µg/L	0.1		<0.1		45.8		19.5		<0.1
2-methylphenol	µg/L	0.1		<0.2	6900	4240	<10	24.3	<1	0.6
2-nitrophenol	µg/L	0.1		<0.2	<98	<2	<10	<0.2	<1	<0.2
3-&4-methylphenol	µg/L	2			3640		<20		<2	
3-methylcholanthrene	µg/L	0.1		<0.1		<1		<0.1		<0.1
3-Methylphenol	µg/L	0.1		<0.2		1700		3.2		0.5
4,6-Dinitro-2-methylphenol	µg/L	30								
4-chloro-3-methylphenol	µg/L	0.05		<0.1	<98	<1	<10	<0.1	<1	<0.1
4-methylphenol	mg/L	1E-04		<0.0002		0.14		0.0061		<0.0002
4-nitrophenol	µg/L	0.1		<0.2		<2		<0.2		<0.2
Acenaphthene	µg/L	0.01		<0.1	<98	6.4	85.5	10.9	1.8	<0.1
Acenaphthylene	µg/L	0.01		0.4	<98	20.2	45.4	5.1	6.2	<0.1
Anthracene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	1	<0.1
Benz(a)anthracene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	1	<0.1
Benzo(a) pyrene	µg/L	0.01		<0.05	<98	<0.5	<10	<0.05	0.8	<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05								
Benzo(b)fluoranthene	µg/L	0.1		<0.1	<98	<1	<10	<0.1	<1	<0.1
Benzo(g,h,i)perylene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	<1	<0.1
Benzo(k)fluoranthene	µg/L	0.1		<0.1	<98	<1	<10	<0.1	<1	<0.1
Chrysene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	<1	<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	<1	<0.1
Fluoranthene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	1.2	<0.1
Fluorene	µg/L	0.01		<0.1	<98	<1	80.6	0.8	<1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	<1	<0.1
Naphthalene	µg/L	0.01	70	0.7	5450	2970	8580	1100	10.8	2
PAHs (Sum of total)	µg/L	0.05								
Phenanthrene	µg/L	0.01		<0.1	<98	<1	54.6	<0.1	2	<0.1
Phenol	µg/L	0.1	400	0.3	836	472	<10	2.2	<1	1.1
Pyrene	µg/L	0.01		<0.1	<98	<1	<10	<0.1	1.8	<0.1
CPAH (ESDAT)	µg/L			<0.75	<784	<7.5	<80	<0.75	7.8	<0.75
PAH (ESDAT TOTAL)	µg/L			2.45	6920	3009.1	8956.1	1117.95	33.6	3.45
Halogenated Phenols										
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.2		<2		<0.2		<0.2
2,4,5-trichlorophenol	µg/L	0.1		<0.2	<98	<2	<10	<0.2	<1	<0.2
2,4,6-trichlorophenol	µg/L	0.1		<0.2	<98	<2	<10	<0.2	<1	<0.2
2,4-dichlorophenol	µg/L	0.1		<0.2	<98	<2	<10	<0.2	<1	<0.2
2,6-dichlorophenol	µg/L	0.1		<0.2	<98	<2	<10	<0.2	<1	<0.2
2-chlorophenol	µg/L	0.05		<0.1	<98	<1	<10	<0.1	<1	<0.1
Pentachlorophenol	µg/L	0.05	22	<0.1	<196	<1	<20	<0.1	<2	<0.1
tetrachlorophenols	µg/L	30								
Herbicides										
Dinoseb	µg/L	100								
Inorganics										
Ammonia as N	mg/L	0.01								
Cyanide (Free)	mg/L	0.004			<0.004		<0.004		<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004			<0.004		<0.004		<0.004	
Cyanide (WAD)	mg/L	0.01								
Lead										
Lead (Filtered)	µg/L	0.1	4.4		<0.1		0.4		<0.2	
MAH										
Styrene	µg/L	5								
other										
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.0005	<0.196	<0.005	<0.02	<0.0005	<0.002	<0.0005
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5								
Total BTEX	mg/L	0.01								
PAH										
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1		<1		<0.1		<0.1
Pesticides										
Pesticides (total, NSW Waste 2008)	mg/L			<0.0001	<0.098	<0.001	<0.01	<0.0001	<0.001	<0.0001
Phenolics										
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100								
Phenols (Total Halogenated)	mg/L	0.01								
Phenols (Total Non Halogenated)	mg/L	0.1								
SVOCs										
2-(acetylamino) fluorene	µg/L	0.1		<0.1		<1		<0.1		<0.1
Benzo(e)pyrene	µg/L	0.1		<0.1		<1		<0.1		<0.1
Coronene	µg/L	0.1		<0.1		<1		<0.1		<0.1
Dibenzofuran	µg/L	2								
Hexachlorophene	µg/L	0.1		<0.2		<2		<0.2		<0.2
Perylene	µg/L	0.1		<0.1		<1		<0.1		<0.1
TPH C6-C10	mg/L	0.02								
Draft NEPM TPH fractions										
>C10 - C16 Fraction	mg/L	0.1								
>C10 - C40 Fraction (sum)	µg/L	100								
>C16 - C34 Fraction	mg/L	0.1								
>C34 - C40 Fraction	mg/L	0.1								
Sum of BTEX	mg/L	0.001								
C6 - C10 Fraction	mg/L	0.02								
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02								

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

			Location_Code	BH210	BH210	BH401	BH401	AECOM_BH62	AECOM_BH62	AECOM_BH68
			Field_ID	MW210	MW210_FILTRATE	MW401	MW401_FILTRATE	MW62	MW62_FILTRATE	MW68
			Well	MW210	MW210	MW401	MW401	MW62	MW62	MW68
			Sampled_Date_Time	24/02/2011	24/02/2011	24/02/2011	24/02/2011	24/02/2011	24/02/2011	24/02/2011
			SDG	ES1104095	ES1104095	ES1104161	ES1104161	ES1104095	ES1104095	ES1104095
			Sample Type	Standard	Filtrate	Standard	Filtrate	Standard	Filtrate	Standard
			SampleCode	ES1104095001	ES1104095013	ES1104161002	ES1104161026	ES1104095002	ES1104095014	ES1104095003
ChemName		Unit	EQL	ANZECC (2000) Ecosystems Marine Water (95%)						
Metals										
	Aluminium (Filtered)	mg/L	0.005		<0.01		<0.01		<0.01	<0.01
	Antimony (Filtered)	mg/L	2E-04		<0.0005		<0.0005		<0.0005	<0.0005
	Arsenic (Filtered)	µg/L	0.2		1.5		2.8		0.7	<0.5
	Barium (Filtered)	mg/L	5E-04		0.075		5.25		0.433	0.107
	Beryllium (Filtered)	µg/L	0.1		<0.1		<0.1		<0.1	<0.1
	Cadmium (Filtered)	µg/L	0.05	5.5	0.2		1.6		<0.2	<0.2
	Chromium (Filtered)	µg/L	0.2	4.4	<0.5		<0.5		<0.5	<0.5
	Chromium (hexavalent) (Filtered)	mg/L	0.01							
	Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274						
	Cobalt (Filtered)	µg/L	0.1	1	0.3		1.6		0.2	<0.2
	Copper (Filtered)	µg/L	0.5	1.3	<1		<1		<1	<1
	Manganese (Filtered)	mg/L	5E-04		1.81		0.406		0.0725	0.175
	Mercury (Filtered)	µg/L	0.1	0.1	<0.1		<0.1		<0.1	<0.1
	Nickel (Filtered)	µg/L	0.5	70	164		66.4		3	3
	Selenium (Filtered)	mg/L	2E-04		<0.002		<0.002		<0.002	<0.002
	Silver (Filtered)	mg/L	1E-04	0.0014	<0.0001		<0.0001		<0.0001	<0.0001
	Vanadium (Filtered)	µg/L	0.2	100	<0.5		0.5		0.7	<0.5
	Zinc (Filtered)	mg/L	0.001	0.015	0.016		0.016		<0.005	<0.005
TPH										
	TPH C6 - C9	µg/L	20		<20		350		<20	<20
	TPH C10 - C14	µg/L	50		80		790		<50	<50
	TPH C15-C36	mg/L			0.8		1.12		0.44	<0.15
	TPH C15-C28	µg/L	100		730		1070		390	<100
	TPH C29-C36	µg/L	50		70		<50		<50	<50
	TPH+C10 - C36 (Sum of total)	µg/L	50		880		1860 - 1910		390 - 490	<50
	TPH C10 - C40 (Sum of total)	µg/L	100							
BTEX										
	Total Xylene (ESDAT)	µg/L	2		<4		42		<4	<4
	Benzene	µg/L	1	700	2		127		<1	<1
	Ethylbenzene	µg/L	1		3		<5		<2	<2
	Toluene	µg/L	1		<5		108		<5	<5
	Xylene (m & p)	µg/L	2		<2		27		<2	<2
	Xylene (o)	µg/L	1		<2		15		<2	<2
PAH/Phenols										
	2,4-dimethylphenol	µg/L	0.1		<1	<0.2	108	50	<1	<0.2	<1
	2,4-dinitrophenol	mg/L	0.03								
	2-methylnaphthalene	µg/L	0.1			<0.1		2.1		<0.1	
	2-methylphenol	µg/L	0.1		<1	<0.2	63.4	27.8	<1	0.3	<1
	2-nitrophenol	µg/L	0.1		<1	<0.2	<4.9	<0.2	<1	<0.2	<1
	3-&4-methylphenol	µg/L	2		<2		111		<2		<2
	3-methylcholanthrene	µg/L	0.1			<0.1		<0.1		<0.1	
	3-Methylphenol	µg/L	0.1			<0.2		31.1		0.4	
	4,6-Dinitro-2-methylphenol	µg/L	30								
	4-chloro-3-methylphenol	µg/L	0.05		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	4-methylphenol	mg/L	1E-04			<0.0002		0.0187		<0.0002	
	4-nitrophenol	µg/L	0.1			<0.2		<0.2		<0.2	
	Acenaphthene	µg/L	0.01		<1	<0.1	10.5	1.2	<1	<0.1	<1
	Acenaphthylene	µg/L	0.01		3.1	0.3	12.8	1	<1	<0.1	<1
	Anthracene	µg/L	0.01		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Benz(a)anthracene	µg/L	0.01		1.1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Benzo(a) pyrene	µg/L	0.01		0.9	<0.05	<4.9	<0.05	<0.5	<0.05	<0.5
	Benzo(b)&(k)fluoranthene	µg/L	0.05								
	Benzo(b)fluoranthene	µg/L	0.1		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Benzo(g,h,i)perylene	µg/L	0.01		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Benzo(k)fluoranthene	µg/L	0.1		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Chrysene	µg/L	0.01		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Dibenz(a,h)anthracene	µg/L	0.01		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Fluoranthene	µg/L	0.01		2.6	<0.1	<4.9	<0.1	<1	<0.1	<1
	Fluorene	µg/L	0.01		<1	<0.1	9.4	<0.1	<1	<0.1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Naphthalene	µg/L	0.01	70	<1	0.5	195	47.7	<1	0.4	<1
	PAHs (Sum of total)	µg/L	0.05								
	Phenanthrene	µg/L	0.01		<1	<0.1	16.3	<0.1	<1	<0.1	<1
	Phenol	µg/L	0.1	400	<1	0.4	15	6.6	<1	0.3	<1
	Pyrene	µg/L	0.01		4.2	<0.1	5.2	<0.1	<1	<0.1	<1
	CPAH (ESDAT)	µg/L			8	<0.75	<39.2	<0.75	<7.5	<0.75	<7.5
	PAH (ESDAT TOTAL)	µg/L			22.9	2.15	298.2	51.15	<15.5	1.85	<15.5
Halogenated Phenols										
	2,3,4,6-tetrachlorophenol	µg/L	0.1			<0.2		<0.2		<0.2	
	2,4,5-trichlorophenol	µg/L	0.1		<1	<0.2	<4.9	<0.2	<1	<0.2	<1
	2,4,6-trichlorophenol	µg/L	0.1		<1	<0.2	<4.9	<0.2	<1	<0.2	<1
	2,4-dichlorophenol	µg/L	0.1		<1	<0.2	<4.9	<0.2	<1	<0.2	<1
	2,6-dichlorophenol	µg/L	0.1		<1	<0.2	<4.9	<0.2	<1	<0.2	<1
	2-chlorophenol	µg/L	0.05		<1	<0.1	<4.9	<0.1	<1	<0.1	<1
	Pentachlorophenol	µg/L	0.05	22	<2	<0.1	<9.8	<0.1	<2	<0.1	<2
	tetrachlorophenols	µg/L	30								
Herbicides										
	Dinoseb	µg/L	100								
Inorganics										
	Ammonia as N	mg/L	0.01								
	Cyanide (Free)	mg/L	0.004		<0.004		<0.004		<0.004		<0.004
	Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004		<0.004		<0.004		<0.004
	Cyanide (WAD)	mg/L	0.01								
Lead										
	Lead (Filtered)	µg/L	0.1	4.4	<0.2		0.2		<0.2		<0.2
MAH										
	Styrene	µg/L	5								
other										
	Scheduled chemicals (NSW Waste 2008)	mg/L			<0.002	<0.0005	<0.0098	<0.0005	<0.002	<0.0005	<0.002
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5								
	Total BTEX	mg/L	0.01								
PAH										
	7,12-dimethylbenz(a)anthracene	µg/L	0.1			<0.1		<0.1		<0.1	
Pesticides										
	Pesticides (total, NSW Waste 2008)	mg/L			<0.001	<0.0001	<0.0049	<0.0001	<0.001	<0.0001	<0.001
Phenolics										
	4,6-Dinitro-o-cyclohexyl phenol	µg/L	100								
	Phenols (Total Halogenated)	mg/L	0.01								
	Phenols (Total Non Halogenated)	mg/L	0.1								
SVOCs										
	2-(acetylamino) fluorene	µg/L	0.1			<0.1		<0.1		<0.1	
	Benzo(e)pyrene	µg/L	0.1			<0.1		<0.1		<0.1	
	Coronene	µg/L	0.1			<0.1		<0.1		<0.1	
	Dibenzofuran	µg/L	2								
	Hexachlorophene	µg/L	0.1			<0.2		<0.2		<0.2	
	Perylene	µg/L	0.1			<0.1		<0.1		<0.1	
	TPH C6-C10	mg/L	0.02								
Draft NEPM TPH fractions										
	>C10 - C16 Fraction	mg/L	0.1								
	>C10 - C40 Fraction (sum)	µg/L	100								
	>C16 - C34 Fraction	mg/L	0.1								
	>C34 - C40 Fraction	mg/L	0.1								
	Sum of BTEX	mg/L	0.001								
	C6 - C10 Fraction	mg/L	0.02								
	C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02								

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T8
Groundwater Filtrate Results

			Location_Code	AECOM_BH68	BH401	BH401	BH401	BH198	BH198
			Field_ID	MW68_FILTRATE	QC615	QC615 FILTRATE	QC616	QC618	QC618 FILTRATE
			Well	MW68	MW401	MW401	MW401	MW198	MW198
			Sampled_Date_Time	24/02/2011	24/02/2011	24/02/2011	24/02/2011	25/02/2011	25/02/2011
			SDG	ES1104095	ES1104161	ES1104161	292248	ES1104161	ES1104161
			Sample Type	Filtrate	Standard	Filtrate	Standard	Filtrate	Filtrate
			SampleCode	ES1104095015	ES1104161008	ES1104161032	S11-MA30474	ES1104161007	ES1104161031
ChemName	**Unit**	**EQL**	**ANZECC (2000) Ecosystems Marine Water (95%)**						
Metals									
Aluminium (Filtered)	mg/L	0.005			<0.01		<0.05	0.02	
Antimony (Filtered)	mg/L	2E-04			<0.0005		<0.005	<0.0002	
Arsenic (Filtered)	µg/L	0.2			3.1		3	3.7	
Barium (Filtered)	mg/L	5E-04			5.27		5.4	0.0517	
Beryllium (Filtered)	µg/L	0.1			<0.1		<1	<0.1	
Cadmium (Filtered)	µg/L	0.05	5.5		0.5		0.7	1.66	
Chromium (Filtered)	µg/L	0.2	4.4		<0.5		<1	1.1	
Chromium (hexavalent) (Filtered)	mg/L	0.01							
Chromium (Trivalent) (Filtered)	mg/L	0.01	0.0274						
Cobalt (Filtered)	µg/L	0.1	1		1.4		1	0.6	
Copper (Filtered)	µg/L	0.5	1.3		<1		<1	<0.5	
Manganese (Filtered)	mg/L	5E-04			0.394		0.31	0.102	
Mercury (Filtered)	µg/L	0.1	0.1		<0.1		<0.1	<0.1	
Nickel (Filtered)	µg/L	0.5	70		64.2		47	64.6	
Selenium (Filtered)	mg/L	2E-04			<0.002		0.003	<0.0002	
Silver (Filtered)	mg/L	1E-04	0.0014		<0.0001		<0.005	<0.0001	
Vanadium (Filtered)	µg/L	0.2	100		0.6		<5	0.7	
Zinc (Filtered)	mg/L	0.001	0.015		0.011		0.009	0.008	
TPH									
TPH C6 - C9	µg/L	20			400		330	<20	
TPH C10 - C14	µg/L	50			800		1000	<50	
TPH C15-C36	mg/L				1.1		1.52	<0.15	
TPH C15-C28	µg/L	100			1050		1300	<100	
TPH C29-C36	µg/L	50			<50		220	<50	
TPH+C10 - C36 (Sum of total)	µg/L	50			1850 - 1900		2500 - 2520	<50	
TPH C10 - C40 (Sum of total)	µg/L	100							
BTEX									
Total Xylene (ESDAT)	µg/L	2			44		46	<4	
Benzene	µg/L	1	700		138		140	<1	
Ethylbenzene	µg/L	1			<5		4	<2	
Toluene	µg/L	1			112		120	<5	
Xylene (m & p)	µg/L	2			30		31	<2	
Xylene (o)	µg/L	1			14		15	<2	
PAH/Phenols									
2,4-dimethylphenol	µg/L	0.1		0.2	95.3	48.4	180	<1	<0.2
2,4-dinitrophenol	mg/L	0.03					<0.03		
2-methylnaphthalene	µg/L	0.1		0.2		2.3			<0.1
2-methylphenol	µg/L	0.1		0.3	58.2	26.7	60	<1	<0.2
2-nitrophenol	µg/L	0.1		<0.2	<10	<0.2	<10	<1	<0.2
3-&4-methylphenol	µg/L	2			111		160	<2	
3-methylcholanthrene	µg/L	0.1		<0.1		<0.1			<0.1
3-Methylphenol	µg/L	0.1		0.8		29.3			0.2
4,6-Dinitro-2-methylphenol	µg/L	30					<30		
4-chloro-3-methylphenol	µg/L	0.05		<0.1	<10	<0.1	<10	<1	<0.1
4-methylphenol	mg/L	1E-04		0.0003		0.0179			<0.0002
4-nitrophenol	µg/L	0.1		<0.2		<0.2	<30		<0.2
Acenaphthene	µg/L	0.01		<0.1	10.5	1.4	11	<1	<0.1
Acenaphthylene	µg/L	0.01		<0.1	12.1	1.2	10	2.4	0.4
Anthracene	µg/L	0.01		<0.1	<10	0.1	2	<1	<0.1
Benz(a)anthracene	µg/L	0.01		<0.1	<10	<0.1	<1	<1	<0.1
Benzo(a) pyrene	µg/L	0.01		<0.05	<10	<0.05	<1	<0.5	<0.05
Benzo(b)&(k)fluoranthene	µg/L	0.05					<2		
Benzo(b)fluoranthene	µg/L	0.1		<0.1	<10	<0.1		<1	<0.1
Benzo(g,h,i)perylene	µg/L	0.01		<0.1	<10	<0.1	<1	<1	<0.1
Benzo(k)fluoranthene	µg/L	0.1		<0.1	<10	<0.1		<1	<0.1
Chrysene	µg/L	0.01		<0.1	<10	<0.1	<1	<1	<0.1
Dibenz(a,h)anthracene	µg/L	0.01		<0.1	<10	<0.1	<1	<1	<0.1
Fluoranthene	µg/L	0.01		<0.1	<10	<0.1	3	<1	<0.1
Fluorene	µg/L	0.01		<0.1	11.4	<0.1	11	<1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.01		<0.1	<10	<0.1	<1	<1	<0.1
Naphthalene	µg/L	0.01	70	0.8	184	39.6	270	<1	0.6
PAHs (Sum of total)	µg/L	0.05					330		
Phenanthrene	µg/L	0.01		0.2	15	<0.1	15	<1	<0.1
Phenol	µg/L	0.1	400	0.9	15.4	9.4	<50	<1	0.5
Pyrene	µg/L	0.01		<0.1	<10	<0.1	3	<1	<0.1
CPAH (ESDAT)	µg/L			<0.75	<80	<0.75	<6	<7.5	<0.75
PAH (ESDAT TOTAL)	µg/L			2.35	343	43.45	331	16.9	2.35
Halogenated Phenols									
2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.2		<0.2			<0.2
2,4,5-trichlorophenol	µg/L	0.1		<0.2	<10	<0.2	<10	<1	<0.2
2,4,6-trichlorophenol	µg/L	0.1		<0.2	<10	<0.2	<10	<1	<0.2
2,4-dichlorophenol	µg/L	0.1		<0.2	<10	<0.2	<3	<1	<0.2
2,6-dichlorophenol	µg/L	0.1		<0.2	<10	<0.2	<3	<1	<0.2
2-chlorophenol	µg/L	0.05		<0.1	<10	<0.1	<3	<1	<0.1
Pentachlorophenol	µg/L	0.05	22	<0.1	<20	<0.1	<10	<2	<0.1
tetrachlorophenols	µg/L	30					<30		
Herbicides									
Dinoseb	µg/L	100					<100		
Inorganics									
Ammonia as N	mg/L	0.01							
Cyanide (Free)	mg/L	0.004			<0.004		0.007	<0.004	
Weak Acid Dissociable Cyanide	mg/L	0.004			<0.004			<0.004	
Cyanide (WAD)	mg/L	0.01					0.01		
Lead									
Lead (Filtered)	µg/L	0.1	4.4		<0.2		<1	<0.1	
MAH									
Styrene	µg/L	5							
other									
Scheduled chemicals (NSW Waste 2008)	mg/L			<0.0005	<0.02	<0.0005	<0.01	<0.002	<0.0005
Polycylic aromatic hydrocarbons EPA448	µg/L	0.5							
Total BTEX	mg/L	0.01					0.31		
PAH									
7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1		<0.1			<0.1
Pesticides									
Pesticides (total, NSW Waste 2008)	mg/L			<0.0001	<0.01	<0.0001	<0.01	<0.001	<0.0001
Phenolics									
4,6-Dinitro-o-cyclohexyl phenol	µg/L	100					<100		
Phenols (Total Halogenated)	mg/L	0.01					<0.01		
Phenols (Total Non Halogenated)	mg/L	0.1					0.4		
SVOCs									
2-(acetylamino) fluorene	µg/L	0.1		<0.1		<0.1			<0.1
Benzo(e)pyrene	µg/L	0.1		<0.1		<0.1			<0.1
Coronene	µg/L	0.1		<0.1		<0.1			<0.1
Dibenzofuran	µg/L	2							
Hexachlorophene	µg/L	0.1		<0.2		<0.2			<0.2
Perylene	µg/L	0.1		<0.1		<0.1			<0.1
TPH C6-C10	mg/L	0.02							
Draft NEPM TPH fractions									
>C10 - C16 Fraction	mg/L	0.1							
>C10 - C40 Fraction (sum)	µg/L	100							
>C16 - C34 Fraction	mg/L	0.1							
>C34 - C40 Fraction	mg/L	0.1							
Sum of BTEX	mg/L	0.001							
C6 - C10 Fraction	mg/L	0.02							
C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02							

Notes

Shading indicates criteria exceedence
mg/L - milligrams pre litre
µg/L - micrograms per litre
LOR - Laboratory Limit of Reporting
- denotes not analysed
< denotes result less than the LOR
ANZECC (2000) Water Quality Guidelines - Marine (95%) trigger values
* ANZECC (2000) 99% trigger value
CPAH= Sum of 8 PAH Compounds (Benz(a)anthracene Benzo(a) pyrene; Benzo(b)fluoranthene; Benzo(g,h,i)perylene; Benzo(k)fluoranthene; Chrysene; Dibenz(a,h)anthracene; Indeno(1,2,3-c,d)pyrene)

Filtrate = sample double filtered prior to analysis
Standard = Unfiltered result

AECOM

Table T9
Filter Cake Results

		Field_ID	IT3D FP1	IT3M FP1	IT3M FP2	IT3S FP1	IT3S FP2	MW 69 FP1	MW 69 FP2	MW08 FP1
		SDG	ES1104161	ES1104161	ES1104161	ES1104161	ES1104161	ES1104161	ES1104161	ES1104220
		SampleCode	ES1104161017	ES1104161015	ES1104161016	ES1104161027	ES1104161027	ES1104161025	ES1104161025	ES1104220009
		Monitoring_Zone	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	Block 5	Block 5	Public Domain Blocks 4&5
		Location_Code	BH405	BH405	BH405	BH405	BH405	AECOM_BH69	AECOM_BH69	BH046
		Well	IT3D	IT3M	IT3M	IT3S	IT3S	MW69	MW69	MW08
		Sampled_Date_Time	02/25/2011	02/25/2011	02/25/2011	02/25/2011	02/25/2011	02/25/2011	02/25/2011	02/28/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName		output unit	EQL							
PAH										
	7,12-dimethylbenz(a)anthracene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<10
PAH/Phenols										
	m-Cresol	µg/Filter	10							
	o-Cresol	µg/Filter	10							
	p-Cresol	µg/Filter	10							
	2,4-dimethylphenol	µg/Filter	10							
	2-methylnaphthalene	µg/Filter	10	1870	<20	<20			30	<20
	2-methylphenol	µg/Filter	10							
	2-nitrophenol	µg/Filter	10							
	3-&4-methylphenol	µg/Filter	10							
	3-methylcholanthrene	µg/Filter	10	30	20	<20	<20	<20	<20	<10
	3-Methylphenol	µg/Filter	10							
	4-chloro-3-methylphenol	µg/Filter	10							
	4-methylphenol	µg/Filter	10							
	4-nitrophenol	µg/Filter	10							
	Acenaphthene	µg/Filter	10	280	30	<20	<20	<20	130	<20	20
	Acenaphthylene	µg/Filter	10	1090	70	<20	<20	<20	390	<20	<10
	Anthracene	µg/Filter	10	720	160	<20	40	<20	180	<20	<10
	Benz(a)anthracene	µg/Filter	10	690	690	<20	270	<20	260	<20	<10
	Benzo(a) pyrene	µg/Filter	10	700	1000	<20	630	<20	220	<20	<10
	Benzo(b)fluoranthene	µg/Filter	10	700	1040	<20	590	<20	200	<20	<10
	Benzo(g,h,i)perylene	µg/Filter	10	180	280	<20	230	<20	30	<20	<10
	Benzo(k)fluoranthene	µg/Filter	10	360	530	<20	300	<20	60	<20	<10
	Chrysene	µg/Filter	10	540	660	<20	230	<20	240	<20	<10
	Dibenz(a,h)anthracene	µg/Filter	10	30	30	<20	20	<20	<20	<20	<10
	Fluoranthene	µg/Filter	10	1090	890	<20	270	<20	330	<20	20
	Fluorene	µg/Filter	10	1080	60	<20	<20	<20	100	<20	20
	Indeno(1,2,3-c,d)pyrene	µg/Filter	10	160	210	<20	180	<20	20	<20	<10
	Naphthalene	µg/Filter	10	15800	90	<20	40	<20	1850	120	110
	Phenanthrene	µg/Filter	10	2550	560	<20	120	<20	800	<20	50
	Phenol	µg/Filter	10							
	Pyrene	µg/Filter	10	960	1110	<20	510	<20	480	<20	10
	N-2-Fluorenyl Acetamide	µg/Filter	100							
SVOCs										
	2-(acetylamino) fluorene	µg/Filter	10							
	Benzo(e)pyrene	µg/Filter	10						100	<20	
	Coronene	µg/Filter	10	<20	<20	<20		<20	<20	<20	<10
	Hexachlorophene	µg/Filter	10							
	Perylene	µg/Filter	10	130	250	<20	140	<20	40	<20	<10
Halogenated Phenols										
	2.3.4.6-Tetrachlorophenol	µg/Filter	10							
	2.4.5-Trichlorophenol	µg/Filter	10							
	2.4.6-Trichlorophenol	µg/Filter	10							
	2.4-Dichlorophenol	µg/Filter	10							
	2.6-Dichlorophenol	µg/Filter	10							
	2-Chlorophenol	µg/Filter	10							
	Pentachlorophenol	µg/Filter	10							

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Table T9
Filter Cake Results

		Field_ID	MW08 FP2	MW198 FP1	MW198 FP2	MW200 FP1	MW200 FP2	MW204SFP1	MW204S FP2	MW209 FP1
		SDG	ES1104220	ES1104161	ES1104161	ES1104220	ES1104220	ES1104220	ES1104220	ES1104220
		SampleCode	ES11042200010	ES11041610300	ES11041610300	ES11042200013	ES11042200014	ES11042200007	ES11042200008	ES11042200011
		Monitoring_Zone	Public Domain Blocks 4&5	VMP & PDA - Block 5	VMP & PDA - Block 5	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4	VMP & PDA - Block 4
		Location_Code	BH046	BH198	BH198	BH200	BH200	BH204	BH204	BH209
		Well	MW08	MW198	MW198	MW200	MW200	MW204S	MW204S	MW209
		Sampled_Date_Time	02/28/2011	02/25/2011	02/25/2011	02/28/2011	02/28/2011	02/25/2011	02/25/2011	02/28/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName	**output unit**	**EQL**								
PAH										
7,12-dimethylbenz(a)anthracene	µg/Filter	10	<10	<20	<20			<10	<10	<10
PAH/Phenols										
m-Cresol	µg/Filter	10								
o-Cresol	µg/Filter	10								
p-Cresol	µg/Filter	10								
2,4-dimethylphenol	µg/Filter	10								
2-methylnaphthalene	µg/Filter	10		<20	<20					
2-methylphenol	µg/Filter	10								
2-nitrophenol	µg/Filter	10								
3-&4-methylphenol	µg/Filter	10								
3-methylcholanthrene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	<10
3-Methylphenol	µg/Filter	10								
4-chloro-3-methylphenol	µg/Filter	10								
4-methylphenol	µg/Filter	10								
4-nitrophenol	µg/Filter	10								
Acenaphthene	µg/Filter	10	<10	<20	<20	40	<10	330	190	80
Acenaphthylene	µg/Filter	10	<10	<20	<20	140	30	140	90	460
Anthracene	µg/Filter	10	<10	<20	<20	10	<10	40	<10	200
Benz(a)anthracene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	590
Benzo(a) pyrene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	720
Benzo(b)fluoranthene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	500
Benzo(g,h,i)perylene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	190
Benzo(k)fluoranthene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	260
Chrysene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	420
Dibenz(a,h)anthracene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	40
Fluoranthene	µg/Filter	10	<10	<20	<20	<10	<10	40	<10	400
Fluorene	µg/Filter	10	<10	<20	<20	120	<10	460	90	100
Indeno(1,2,3-c,d)pyrene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	150
Naphthalene	µg/Filter	10	20	20	<20	11200	1810	13400	14400	210
Phenanthrene	µg/Filter	10	<10	<20	<20	80	<10	610	30	290
Phenol	µg/Filter	10								
Pyrene	µg/Filter	10	<10	<20	<20	<10	<10	20	<10	540
N-2-Fluorenyl Acetamide	µg/Filter	100								
SVOCs										
2-(acetylamino) fluorene	µg/Filter	10								
Benzo(e)pyrene	µg/Filter	10								
Coronene	µg/Filter	10	<10	<20	<20			<10	<10	<10
Hexachlorophene	µg/Filter	10								
Perylene	µg/Filter	10	<10	<20	<20	<10	<10	<10	<10	100
Halogenated Phenols										
2.3.4.6-Tetrachlorophenol	µg/Filter	10								
2.4.5-Trichlorophenol	µg/Filter	10								
2.4.6-Trichlorophenol	µg/Filter	10								
2.4-Dichlorophenol	µg/Filter	10								
2.6-Dichlorophenol	µg/Filter	10								
2-Chlorophenol	µg/Filter	10								
Pentachlorophenol	µg/Filter	10								

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Table T9
Filter Cake Results

		Field_ID	MW209 FP2	MW210 FP1	MW210 FP2	MW401 FP1	MW401 FP2	MW62_FP1	MW62_FP2	MW68_FP1
		SDG	ES1104220	ES1104095	ES1104095	ES1104161	ES1104161	ES1104095	ES1104095	ES1104095
		SampleCode	ES1104220012	ES1104094-007	ES1104094-007	ES1104161026	ES1104161026	ES1104095014	ES1104095014	ES1104095015
		Monitoring_Zone	VMP & PDA - Block 4	VMP & PDA - Proposed Southern Cove	IP & PDA - Proposed Southern Co	Block 5	Block 5	VMP & PDA - Block 5	VMP & PDA - Block 5	VMP & PDA - Block 5
		Location_Code	BH209	BH210	BH210	BH401	BH401	AECOM_BH62	AECOM_BH62	AECOM_BH68
		Well	MW209	MW210	MW210	MW401	MW401	MW62	MW62	MW68
		Sampled_Date_Time	02/28/2011	02/24/2011	02/24/2011	02/24/2011	02/24/2011	02/24/2011	02/24/2011	02/24/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName	**output unit**	**EQL**								
PAH										
7,12-dimethylbenz(a)anthracene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	
PAH/Phenols										
m-Cresol	µg/Filter	10								
o-Cresol	µg/Filter	10								
p-Cresol	µg/Filter	10								
2,4-dimethylphenol	µg/Filter	10			<1.0					
2-methylnaphthalene	µg/Filter	10		<10	<1.0	160	40			
2-methylphenol	µg/Filter	10			<1.0					
2-nitrophenol	µg/Filter	10			<1.0					
3-&4-methylphenol	µg/Filter	10			<2.0					
3-methylcholanthrene	µg/Filter	10	<10	<10	<1.0	<20	<20	<10	<10	
3-Methylphenol	µg/Filter	10						<10	<10	
4-chloro-3-methylphenol	µg/Filter	10			<1.0					
4-methylphenol	µg/Filter	10								
4-nitrophenol	µg/Filter	10								
Acenaphthene	µg/Filter	10	<10	<10	<10	50	<20	<10	<10	<10
Acenaphthylene	µg/Filter	10	<10	<10	<10	40	<20	<10	<10	<10
Anthracene	µg/Filter	10	<10	<10	<10	20	<20	<10	<10	<10
Benz(a)anthracene	µg/Filter	10	<10	10	<10	<20	<20	<10	<10	<10
Benzo(a) pyrene	µg/Filter	10	<10	10	<10	<20	<20	<10	<10	<10
Benzo(b)fluoranthene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Benzo(g,h,i)perylene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Benzo(k)fluoranthene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Chrysene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Dibenz(a,h)anthracene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Fluoranthene	µg/Filter	10	<10	20	<10	<20	<20	<10	<10	<10
Fluorene	µg/Filter	10	<10	<10	<10	60	<20	<10	<10	<10
Indeno(1,2,3-c,d)pyrene	µg/Filter	10	<10	<10	<10	<20	<20	<10	<10	<10
Naphthalene	µg/Filter	10	<10	<10	<10	620	270	<10	<10	<10
Phenanthrene	µg/Filter	10	<10	<10	<10	110	<20	<10	<10	<10
Phenol	µg/Filter	10		<10	<10			<10	<10	
Pyrene	µg/Filter	10	<10	20	<10	<20	<20	<10	<10	<10
N-2-Fluorenyl Acetamide	µg/Filter	100								
SVOCs										
2-(acetylamino) fluorene	µg/Filter	10								
Benzo(e)pyrene	µg/Filter	10								
Coronene	µg/Filter	10	<10					<10	<10	
Hexachlorophene	µg/Filter	10								
Perylene	µg/Filter	10	<10							
Halogenated Phenols										
2.3.4.6-Tetrachlorophenol	µg/Filter	10								
2.4.5-Trichlorophenol	µg/Filter	10								
2.4.6-Trichlorophenol	µg/Filter	10								
2.4-Dichlorophenol	µg/Filter	10								
2.6-Dichlorophenol	µg/Filter	10								
2-Chlorophenol	µg/Filter	10								
Pentachlorophenol	µg/Filter	10								

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Table T9
Filter Cake Results

		Field_ID	MW68_FP2	IT04S FP1	IT04M FP1	IT04D FP1	IT05S FP1	IT05M FP1	IT05D FP1	Filter Paper Blank	IT04S FP2	IT04M FP2	IT04D FP2
		SDG	ES1104095	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584	ES1110584
		SampleCode	ES1104095015	ES1110584014	ES1110584015	ES1110584016	ES1110584017	ES1110584018	ES1110584019	ES1110584020	ES1110584021	ES1110584022	ES1110584023
		Monitoring_Zone	VMP & PDA - Block 5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5
		Location_Code	AECOM_BH68	FP1	FP1	FP1	FP1	FP1	FP1	FP1	FP2	FP2	FP2
		Well	MW68	IT04S	IT04M	IT04D	IT05S	IT05M	IT05D	Filter Paper Blank	IT04S	IT04M	IT04D
		Sampled_Date_Time	02/24/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011	20/05/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName		**output unit**	**EQL**										
PAH													
	7,12-dimethylbenz(a)anthracene	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
PAH/Phenols													
	m-Cresol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	o-Cresol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	p-Cresol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2,4-dimethylphenol	µg/Filter	10		<10	<10	60	<10	<20	<10	<10	<10	<10	<10
	2-methylnaphthalene	µg/Filter	10		<10	20	<20	<10	<20	<10	<10	<10	<10	<10
	2-methylphenol	µg/Filter	10											
	2-nitrophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	3-&4-methylphenol	µg/Filter	10											
	3-methylcholanthrene	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	3-Methylphenol	µg/Filter	10											
	4-chloro-3-methylphenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	4-methylphenol	µg/Filter	10											
	4-nitrophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	Acenaphthene	µg/Filter	10	<10	<10	20	<20	<10	<20	<10	<10	<10	<10	<10
	Acenaphthylene	µg/Filter	10	<10	<10	60	<20	40	<20	<10	<10	<10	<10	<10
	Anthracene	µg/Filter	10	<10	<10	110	<20	80	<20	<10	<10	<10	<10	<10
	Benz(a)anthracene	µg/Filter	10	<10	<10	390	<20	260	<20	<10	<10	<10	<10	<10
	Benzo(a) pyrene	µg/Filter	10	<10	<10	540	<20	360	<20	<10	<10	<10	<10	<10
	Benzo(b)fluoranthene	µg/Filter	10	<10	<10	740	<20	380	<20	<10	<10	<10	<10	<10
	Benzo(g,h,i)perylene	µg/Filter	10	<10	<10	120	<20	100	<20	<10	<10	<10	<10	<10
	Benzo(k)fluoranthene	µg/Filter	10	<10	<10	380	<20	220	<20	<10	<10	<10	<10	<10
	Chrysene	µg/Filter	10	<10	<10	440	<20	290	<20	<10	<10	<10	<10	<10
	Dibenz(a,h)anthracene	µg/Filter	10	<10	<10	10	<20	20	<20	<10	<10	<10	<10	<10
	Fluoranthene	µg/Filter	10	<10	<10	640	<20	470	<20	<10	<10	<10	<10	<10
	Fluorene	µg/Filter	10	<10	<10	30	<20	<10	<20	<10	<10	<10	<10	<10
	Indeno(1,2,3-c,d)pyrene	µg/Filter	10	<10	<10	110	<20	80	<20	<10	<10	<10	<10	<10
	Naphthalene	µg/Filter	10	<10	<10	70	40	20	<20	270	<10	<10	<10	<10
	Phenanthrene	µg/Filter	10	<10	<10	280	<20	260	<20	<10	<10	<10	<10	<10
	Phenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	Pyrene	µg/Filter	10	<10	<10	770	<20	480	<20	<10	<10	<10	<10	<10
	N-2-Fluorenyl Acetamide	µg/Filter	100		<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
SVOCs														
	2-(acetylamino) fluorene	µg/Filter	10											
	Benzo(e)pyrene	µg/Filter	10		<10	280	<20	170	<20	<10	<10	<10	<10	<10
	Coronene	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	Hexachlorophene	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	Perylene	µg/Filter	10		<10	170	<20	110	<20	<10	<10	<10	<10	<10
Halogenated Phenols														
	2.3.4.6-Tetrachlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2.4.5-Trichlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2.4.6-Trichlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2.4-Dichlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2.6-Dichlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	2-Chlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10
	Pentachlorophenol	µg/Filter	10		<10	<10	<20	<10	<20	<10	<10	<10	<10	<10

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Table T9
Filter Cake Results

		Field_ID	IT05S FP2	IT05M FP2	IT05D FP2	Filter Paper Blank	IT07_Shallow FP1	IT07_Shallow FP2	IT07_Mid FP1	IT07_Mid FP2	IT07_Deep FP1	IT07_Deep FP2
		SDG	ES1110584	ES1110584	ES1110584	ES1110584	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663
		SampleCode	ES1110584024	ES1110584025	ES1110584026	ES1110584027	ES1108663007	ES1108663008	ES1108663009	ES1108663010	ES1108663011	ES1108663012
		Monitoring_Zone	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	Pub Domain - 4&5	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS
		Location_Code	FP2	FP2	FP2	FP2	FP1	FP2	FP1	FP2	FP1	FP2
		Well	IT05S	IT05M	IT05D	Filter Paper Blank	IT07_Shallow	IT07_Shallow	IT07_Mid	IT07_Mid	IT07_Deep	IT07_Deep
		Sampled_Date_Time	20/05/2011	20/05/2011	20/05/2011	20/05/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName		output unit	EQL									
PAH												
	7,12-dimethylbenz(a)anthracene	µg/Filter	10	<10	<20	<10	<10	<20	<20	<20	<20	<20	<20
PAH/Phenols												
	m-Cresol	µg/Filter	10	<10	<20	<10	<10						
	o-Cresol	µg/Filter	10	<10	<20	<10	<10						
	p-Cresol	µg/Filter	10	<10	<20	<10	<10						
	2,4-dimethylphenol	µg/Filter	10	<10	<20	<10	<10						
	2-methylnaphthalene	µg/Filter	10	<10	<20	<10	<10	<20	<20	<20	<20	<20	<20
	2-methylphenol	µg/Filter	10										
	2-nitrophenol	µg/Filter	10	<10	<20	<10	<10						
	3-&4-methylphenol	µg/Filter	10										
	3-methylcholanthrene	µg/Filter	10	<10	<20	<10	<10	<20	<20	<20	<20	<20	<20
	3-Methylphenol	µg/Filter	10										
	4-chloro-3-methylphenol	µg/Filter	10	<10	<20	<10	<10						
	4-methylphenol	µg/Filter	10										
	4-nitrophenol	µg/Filter	10	<10	<20	<10	<10						
	Acenaphthene	µg/Filter	10	<10	<20	<10	<10	<20	<20	<20	<20	<20	<20
	Acenaphthylene	µg/Filter	10	<10	<20	<10	<10	30	<20	<20	<20	<20	<20
	Anthracene	µg/Filter	10	<10	<20	<10	<10	50	<20	40	<20	<20	<20
	Benz(a)anthracene	µg/Filter	10	<10	<20	<10	<10	250	<20	120	<20	60	<20
	Benzo(a) pyrene	µg/Filter	10	<10	<20	<10	<10	430	<20	180	<20	80	<20
	Benzo(b)fluoranthene	µg/Filter	10	<10	<20	<10	<10	310	<20	120	<20	60	<20
	Benzo(g,h,i)perylene	µg/Filter	10	<10	<20	<10	<10	200	<20	60	<20	30	<20
	Benzo(k)fluoranthene	µg/Filter	10	<10	<20	<10	<10	290	<20	140	<20	60	<20
	Chrysene	µg/Filter	10	<10	<20	<10	<10	260	<20	120	<20	60	<20
	Dibenz(a,h)anthracene	µg/Filter	10	<10	<20	<10	<10	60	<20	<20	<20	<20	<20
	Fluoranthene	µg/Filter	10	<10	<20	<10	<10	440	<20	230	<20	110	<20
	Fluorene	µg/Filter	10	<10	<20	<10	<10	<20	<20	<20	<20	<20	<20
	Indeno(1,2,3-c,d)pyrene	µg/Filter	10	<10	<20	<10	<10	170	<20	60	<20	20	<20
	Naphthalene	µg/Filter	10	<10	<20	280	<10	<20	<20	<20	<20	<20	<20
	Phenanthrene	µg/Filter	10	<10	<20	<10	<10	160	<20	100	<20	50	<20
	Phenol	µg/Filter	10	<10	<20	<10	<10						
	Pyrene	µg/Filter	10	<10	<20	<10	<10	530	<20	350	<20	120	<20
	N-2-Fluorenyl Acetamide	µg/Filter	100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200
SVOCs													
	2-(acetylamino) fluorene	µg/Filter	10										
	Benzo(e)pyrene	µg/Filter	10	<10	<20	<10	<10	260	<20	120	<20	60	<20
	Coronene	µg/Filter	10	<10	<20	<10	<10	40	<20	<20	<20	<20	<20
	Hexachlorophene	µg/Filter	10	<10	<20	<10	<10						
	Perylene	µg/Filter	10	<10	<20	<10	<10	120	<20	<20	<20	20	<20
Halogenated Phenols													
	2.3.4.6-Tetrachlorophenol	µg/Filter	10	<10	<20	<10	<10						
	2.4.5-Trichlorophenol	µg/Filter	10	<10	<20	<10	<10						
	2.4.6-Trichlorophenol	µg/Filter	10	<10	<20	<10	<10						
	2.4-Dichlorophenol	µg/Filter	10	<10	<20	<10	<10						
	2.6-Dichlorophenol	µg/Filter	10	<10	<20	<10	<10						
	2-Chlorophenol	µg/Filter	10	<10	<20	<10	<10						
	Pentachlorophenol	µg/Filter	10	<10	<20	<10	<10						

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Table T9
Filter Cake Results

		Field_ID	IT06_Shallow FP1	IT06_Shallow FP2	IT06_Mid FP1	IT06_Mid FP2	IT06_Deep FP1	IT06_Deep FP2	FP1 Blank	FP2 Blank
		SDG	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663	ES1108663
		SampleCode	ES1108663013	ES1108663014	ES1108663015	ES1108663016	ES1108663017	ES1108663018	ES1108663026	ES1108663027
		Monitoring_Zone	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS	ORWS
		Location_Code	FP1	FP2	FP1	FP2	FP1	FP2		
		Well	IT06_Shallow	IT06_Shallow	IT06_Mid	IT06_Mid	IT06_Deep	IT06_Deep	FP1 Blank	FP2 Blank
		Sampled_Date_Time	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011	27/04/2011
		SampleComments	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake	Filtercake
ChemName		output unit	EQL							
PAH										
	7,12-dimethylbenz(a)anthracene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
PAH/Phenols										
	m-Cresol	µg/Filter	10							
	o-Cresol	µg/Filter	10							
	p-Cresol	µg/Filter	10							
	2,4-dimethylphenol	µg/Filter	10							
	2-methylnaphthalene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	2-methylphenol	µg/Filter	10							
	2-nitrophenol	µg/Filter	10							
	3-&4-methylphenol	µg/Filter	10							
	3-methylcholanthrene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	3-Methylphenol	µg/Filter	10							
	4-chloro-3-methylphenol	µg/Filter	10							
	4-methylphenol	µg/Filter	10							
	4-nitrophenol	µg/Filter	10							
	Acenaphthene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Acenaphthylene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Anthracene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Benz(a)anthracene	µg/Filter	10	<20	<20	30	<20	<20	<20	<20
	Benzo(a) pyrene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Benzo(b)fluoranthene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Benzo(g,h,i)perylene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Benzo(k)fluoranthene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Chrysene	µg/Filter	10	<20	<20	40	<20	<20	<20	<20
	Dibenz(a,h)anthracene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Fluoranthene	µg/Filter	10	<20	<20	40	<20	<20	<20	<20
	Fluorene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Indeno(1,2,3-c,d)pyrene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Naphthalene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Phenanthrene	µg/Filter	10	<20	<20	30	<20	<20	<20	<20
	Phenol	µg/Filter	10							
	Pyrene	µg/Filter	10	<20	<20	50	<20	<20	<20	<20
	N-2-Fluorenyl Acetamide	µg/Filter	100	<200	<200	<200	<200	<200	<200	<200
SVOCs										
	2-(acetylamino) fluorene	µg/Filter	10							
	Benzo(e)pyrene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Coronene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
	Hexachlorophene	µg/Filter	10							
	Perylene	µg/Filter	10	<20	<20	<20	<20	<20	<20	<20
Halogenated Phenols										
	2.3.4.6-Tetrachlorophenol	µg/Filter	10							
	2.4.5-Trichlorophenol	µg/Filter	10							
	2.4.6-Trichlorophenol	µg/Filter	10							
	2.4-Dichlorophenol	µg/Filter	10							
	2.6-Dichlorophenol	µg/Filter	10							
	2-Chlorophenol	µg/Filter	10							
	Pentachlorophenol	µg/Filter	10							

Notes
FP - filter paper
< denotes result less than LOR
ug/Filter = micrograms per filter paper

Appendix C

Data Quality Objectives

1.0 Data Quality Objectives

In determining the type, quantity and quality of data needed to support decisions relating to the environmental condition of the Site, AECOM has adopted the seven-step process to develop the DQOs in accordance with NSW DEC (2006). In developing the DQOs for the investigation an initial phase of review was necessary to appraise relevant and available background information and to develop a preliminary conceptual site contamination model identifying the areas of the Site that required investigation for the purpose of assessing the requirements for either the management and/or remediation during the re-development of the Site. These matters are addressed in the DQOs presented below.

1.1 Step 1 - State the Problem

The Site is proposed to be remediated to remove the NSW Environment Protection Authority (EPA) Declaration.

The Site (refer Figure F2) was used to manufacture gas from approximately 1840 to 1921 and it is understood that some of the former gas works infrastructure remains in place underlying the current slab and adjacent roadway (Hickson Road). Contamination has been reported in fill material, soil and groundwater underlying the Site, the remainder of Barangaroo and adjacent portions of Hickson Road, and sediment in the adjacent Darling Harbour. The Site has been the subject of reclamation activities over the years, which appears to have consisted of placement of up to 10 metres of fill material.

Past site environmental and geotechnical investigations were reviewed by AECOM and based on data gaps identified, AECOM undertook three DGI's across the Barangaroo development area, which are listed below:

- AECOM, 2010a. Data Gap Investigation, EPA Declaration Area (Parts of Barangaroo Site and Hickson Road), Millers Point, NSW. 23 September;
- AECOM, 2010b. Data Gap Investigation, Other Remediation Works North, Hickson Road, Millers Point, NSW. 20 September;
- AECOM, 2010b. Data Gap Investigation, Other Remediation Works (South) Area, Hickson Road, Millers Point, NSW. 27 May.

AECOM was concurrently undertaking Human Health and Ecological Risk Assessments (HHERA) and Remediation Action Plans (RAP) for the various development areas of Barangaroo.

The RAP for the NSW EPA Declaration Area requires further input of additional data to improve the delineation of the vertical and lateral extent of identified contaminated materials around (both within and outside) the DECCW Declaration Area and to assess whether these impacts will require remediation to facilitate removal of the DECCW Declaration. Additionally the HHERA required further data to refine determine site specific criteria.

Additionally, spatial data closer to the DECCW Declaration Area are required for the Groundwater Discharge Study (DGS) to build on the current data and support the assumptions made for the VMP HHERA regarding the conceptual fate and transport of contamination.

Specifically the following data gaps that need to be addressed and supporting rationale are summarised in the table below:

New Boreholes and Monitoring Wells	Rationale
BH400	Delineate soil impacts (vertically & horizontally) around BH70 and adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH401/MW401	Delineate soil impacts (vertically & horizontally) and groundwater impacts around BH70. Note the existing data set lacks information at depth.
BH402	Delineate soil impacts (vertically & horizontally) around BH70 and adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH403	Fill data gap and assess soil impacts (vertically & horizontally) adjacent to DECCW boundary. Note the existing data set lacks information at depth.

New Boreholes and Monitoring Wells	Rationale
BH404	Fill data gap and assess soil conditions (vertically & horizontally) adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH405/IT03 [2]	Fill data gap and assess soil impacts (vertically & horizontally) adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH406	Fill data gap and assess soil impacts (vertically & horizontally) adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH407	Fill data gap and assess soil impacts (vertically & horizontally) adjacent to DECCW boundary. Note the existing data set lacks information at depth.
BH408	Fill data gap (access previously not possible due to location of former building) and assess potential contaminant migration to north east corner of Block 3 from historic gas work structures
BH409	Fill data gap (access previously not possible due to location of former building) and assess potential contaminant migration to north east corner of Block 3 from historic gas work structures
BH410/IT04	Delineate soil impacts (vertically & horizontally) west of BH60 and install nested multilevel piezometer. Note the existing data set lacks information at depth.
BH411/IT05	Delineate soil impacts (vertically & horizontally) and install nested multilevel piezometer. Note the existing data set lacks information at depth.
BH412/IT06	Install nested multilevel piezometer adjacent to PAH impacted area (BH347). Note the existing data set lacks information at depth.
BH413/IT07	Install nested multilevel piezometer adjacent to PAH impacted area (BH353). Note the existing data set lacks information at depth.

1.2 Step 2 - Identify the Decisions

The decisions to be made based on the results of the investigation program are as follows:

- Is there sufficient information on the distribution and characteristics of soil and fill requiring remediation and/or management to allow detailed remedial planning to progress?
- Do the findings of the investigation provide a data set that will be able to be used to assess the risk of material that will remain in-situ and the potential future liability of this material?
- Are there sufficient and definitive Site data to enable remedial cost estimates to be refined?
- What additional data are required to determine and support a preferred remedial solution?
- Are there sufficient data to enable the completion of the quantitive human health and ecological risk assessment?

1.3 Step 3 - Identify Inputs to the Decisions

The inputs required to make the above decisions are as follows:

- Geological data and information relevant to subsurface structures;
- Hydrogeological data;
- Concentrations of chemicals of concern in different fill/soil types;
- Concentrations of chemicals of concern in soil vapour near the former gas works;
- Concentrations of chemicals of concern in groundwater;
- Observation data for presence of building materials or other waste materials including materials potentially containing asbestos, non-aqueous phase liquids, staining, odours and discolouration of the soil media;

- Observation data for presence of separate phase liquids, odours and discolouration of the groundwater and surface water media;
- Distribution of identified contamination both laterally and vertically; and
- Identification of potential contamination below permanent structures.

1.4 Step 4 - Define the Study Boundaries

The boundaries of the investigation have been identified as follows:

- Spatial boundaries – The investigation boundary is limited to the investigation borehole locations shown on Figure F2 within the study area (refer Figure F2) of the Overall Barangaroo Site in Hickson Road, Millers Point, NSW.
- For the purposes of the investigation AECOM has adopted the same boundaries as listed above and as presented on Figure F2.
- Temporal boundaries – The temporal boundaries of the investigation are limited to data collected within the 2011 Supplementary VMP DGI, between February and May 2011. Consideration has also been given to groundwater fluctuations associated with tidal variations resulting from the proximity of the Site to the adjacent harbour.
- Constraints within the study boundaries – Location of underground services and sub-surface structures (e.g. caissons, sea walls, blocky fill etc.).

1.5 Step 5 - Develop a Decision Rule

The decision rules for this investigation are as follows:

1 If a review of the data obtained from this and previous investigations indicate a degree of uncertainty on contamination delineation and distribution, then the proposed remedial strategies will be refined to provide remediation and/or management of those uncertainties and limitations with respect to the proposed redevelopment.

2 If it is determined that additional information is required to further reduce the uncertainties associated with the distribution and characteristics of soil and fill requiring remediation and/or management, with respect to the proposed redevelopment, then appropriate recommendations for further technical assessment or investigation will be provided.

1.6 Step 6 - Specify Limits on Decision Errors

The acceptable limits on decision errors to be applied in the investigation and the manner of addressing possible decision errors have been developed based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness (PARCC) and are presented in Appendix H.

The tolerable limits on decision errors are as follows:

- Probability that 95% of data will satisfy the DQIs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect.
- In applying statistical analysis of a data set:
  - No individual sample result should have a concentration that exceeds 250% of Site assessment criteria;
  - A normal distribution will only be used if the coefficient of variance is not greater than 1.2; and
  - The standard deviation of a sample population should not exceed 50% of the Site assessment criteria.
- The potential for significant decision errors are to be minimised by completing a robust Quality Assurance/Quality Control (QA/QC) program and by completing an investigation that has an appropriate sampling and analytical density for the purposes of the investigation and that the representative sampling is undertaken.

1.7 Step 7 - Optimise the Design for Obtaining Data

The historical use of the Site for various industrial and commercial activities, including the presence of a former gas works facility in the Site and extensive filling and land reclamation works, present the potential for contamination to be present on the Site. Given the history of the Site, and based on information from previous environmental investigations and the general contamination history the chemicals of potential concern include, but may not be limited to, heavy metals, PAHs, TPH, BTEX, cyanide and asbestos. Many of these chemicals may be mobile within the unconsolidated fill materials and able to migrate vertically to the bedrock and laterally to the waters of Darling Harbour. AECOM notes that the presence of contaminated sediment identified in the harbour adjacent to the Site (ERM, 2008b) supports this assertion. The overall design of the investigation on the Site requires considerations of these factors.

Information provided in the previous steps has been considered during the design of the investigation program and are further detailed in the scope of work section of the report.

Appendix D

Borelogs

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH400

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD Grab / Hand Auger / SPT
SURFACE ELEVATION 2.610 m AHD

DATE 14 Feb 11

LOGGED BY K. O'Brien
COMMENTS

NORTHING 6251763.541
EASTING 333686.28

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0		ASPHALT	ASPHALT	0.08
				0.2		FILL	Sandy Gravel FILL. Grey/brown, medium to coarse grained, loose to medium dense, dry. Contains road base gravels (50-60%). No odour, staining or fibre cement material noted.	0.30
0.2		BH400_0.5-0.6		0.4		FILL		
				0.6				
				0.8			Gravelly Sand FILL. Brown, fine to medium grained, medium dense, dry. Contains medium sized basalt and sandstone gravels (40%). No odour, staining or fibre cement material noted.	1.00
0.5				1.0		FILL		
				1.2			Gravelly Sand and Clay FILL. Orange/brown/white, medium dense, dry to slightly moist. Contains clay (50%), gravelly sand (50%). No odour, staining or fibre cement material noted.	
				1.4				
				1.6			Air knifing terminated at 1.1m bgs on 08/02/2011.	
				1.8				
				2.0		FILL		2.00
0.6		BH400_2.0-2.4		2.2			Gravelly Sand FILL. White/yellow, medium dense, very moist to saturated. Contains medium grained sand/crushed sandstone (80%), sandstone gravels (20%). No odour. Minor black staining. No fibre cement material noted. Groundwater encountered at 2.2 m bgs.	
				2.4				
				2.6				
				2.8				
				3.0			Becoming brown/white/yellow, dense, saturated from 3.0 m bgs. Contains coarse basalt gravels. No odour, staining or fibre cement material noted.	
0.5		BH400_3.0-3.4		3.2				
				3.4				
				3.6				
				3.8				
				4.0			Becoming dark grey and black, medium dense from 4.0 m bgs. Contains medium grained sand with silt(60%), sub angular gravels of bitumen and sandstone with traces of brick (40%). No odour, staining or fibre cement material noted.	
1.1		BH400_4.0-4.4		4.2				
				4.4				
				4.6				
				4.8				
				5.0		FILL		5.00
1.2		BH400_5.0-5.4		5.2			Gravelly Sand and Clay FILL. Brown/grey and black, loose, saturated, low plasticity. Contains clay (60%), sand, sandstone gravels and bitumen fragments (40%). Recovery 150 mm. No odour. Minor black staining. No fibre cement material noted.	
				5.4				
				5.6				
				5.8				
				6.0			Becoming grey/brown, medium dense from 6.0 m bgs. Contains sandy clay (70%), sandstone gravels (30%). Very mild hydrocarbon odour. No staining or fibre cement material noted.	
0.6		BH400_6.0-6.4	✳	6.2				
				6.4				
				6.6				
				6.8				
				7.0		FILL		7.00
0.3		BH400_7.0-7.4		7.2			Gravelly Sand FILL. Grey, medium dense, saturated. Contains medium to fine grained sand (70%), sandstone and brick gravels (30%). Mild hydrocarbon odour and black staining. No fibre cement material noted.	
				7.4				
				7.6				
				7.8				
				8.0			Becoming dark grey from 8.0 m bgs. Contains fine to medium grained sand (70%), gravels of brick, concrete and sandstone (30%). Recovery 150 mm. Mild hydrocarbon odour. No staining or fibre cement material noted.	
0.3		BH400_8.0-8.4		8.2				
				8.4				
				8.6				
				8.8				
				9.0			Becoming fine to medium grained sand with minor clay (60%), sub angular sandstone gravels (40%) from 9.0 m bgs. Very mild hydrocarbon odour. No staining or fobre cement material noted.	
0.3		BH400_9.0-9.4	✳	9.2				
				9.4				
				9.6				
				9.8				

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH400

PROJECT NUMBER 60153531 **DATE** 14 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		BH400_10.0-10.4		10.2		FILL *(Continued)*	Gravelly Sand FILL. Grey, medium dense, saturated. Contains medium to fine grained sand (70%), sandstone and brick gravels (30%). Mild hydrocarbon odour and black staining. No fibre cement material noted. *(Continued)*	
				10.4			Becoming grey from 10.0 m bgs. Contains sub angular gravels of basalt, sandstone and concrete (50%), fine to medium grained sand (50%). Recovery 150 mm. No odour, staining or fibre cement material noted.	
				10.6				
				10.8				
				11.0				11.00
0.2		BH400_11.0-11.4		11.2		FILL	Gravelly Clay and Sand FILL. Grey/brown, medium dense, saturated. Contains clay and sand (60%), gravels of brick, sandstone and basalt (40%). Recovery 150 mm. No odour, staining or fibre cement material noted.	
				11.4				
				11.6				
				11.8				
				12.0				12.00
0.2		BH400_12.0-12.4	✳	12.2		FILL	Sand FILL. Pale grey, medium dense, saturated. Contains medium grained sand (90%), sandstone and brick gravels (10%). No odour, staining or fibre cement material noted.	
				12.4				12.40
				12.6		OH	SILTY CLAY. Grey to black, organic clay, soft, saturated, high plasticity. Contains minor shell fragments. No odour, staining or fibre cement material noted.	
				12.8			Becoming hard at 12.5 m bgs to 13.2 m bgs	
				13.0				
				13.2				13.20
0.1		BH400_13.2-13.4	✳	13.4		CL-CH	SILTY CLAY. Mottled orange/grey, medium stiff, saturated, medium to high plasticity. Clay ribboned in SPT. No odour, staining or fibre cement material noted.	
				13.6			Becoming saturated, dark brown from 13.4 m bgs. Contains wood/plant fibres (1-2 mm), semi-decayed. No odour, staining or fibre cement material noted.	
				13.8				
				14.0				14.00
17.4		BH400_14.0-14.2	✳	14.2		CL	SANDY CLAY. Pale grey, medium stiff, saturated, low plasticity. Contains fine grained sand, highly weather sandstone, minor tar staining (<5%), black inclusion of piece of wood (30 mm). Hydrocarbon odour and staining. No fibre cement material noted.	
				14.4			Becoming mottled yellow, brown and red from 14.2 m bgs. Hydrocarbon odour. No staining or fibre cement material noted.	
				14.6				
				14.8				
				15.0				15.00
1.7		BH400_15.0-15.4	✳	15.2		SC	CLAYEY SAND. Orange, medium dense, saturated. Contains highly weather sandstone, fine grained sand. Hydrocarbon odour. No staining or fibre cement material noted.	
				15.4				
				15.6				
				15.8				
				16.0			Very strong hydrocarbon odour and black staining noted at 16.0 m bgs.	
526		BH400_16.0-16.4	✳	16.2				
				16.4				
				16.6				
				16.8			Sheen throughout (>10% tar content)	16.80
							SPT/Drilling refusal at 16.8 m bgs. Total Depth: 16.80 m	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

MONITORING WELL LOG BH401 / MW401

PROJECT NUMBER	60153531	**DATE**	11 Feb 11
PROJECT NAME	VMP Additional DGI	**BLANK**	0.0 to 14.5 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	14.5 to 20.0 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	14.5 to 20.0 m bgs
SAMPLING METHOD	Hand Auger / SPT	**SANITARY SEAL/BENTONITE**	14.0 to 14.5 m bgs and 20.0 to 20.5 m bgs
SURFACE ELEVATION	2.910 m AHD	**STABILISED WATER LEVEL**	2.440 m BTOC
WELL HEAD/TOC	2.83 m AHD	**GROUND WATER ELEVATION**	0.390 m AHD
LOGGED BY	K. O'Brien	**NORTHING**	6251757.5
COMMENTS	Monitoring well 401	**EASTING**	333666.65

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				0.0		ASPHALT	ASPHALT	0.05	
				0.2		FILL	Gravelly Sand FILL. Pale brown, loose, dry. Contains fine to medium grained sand with minor coarse grains (70%), concrete gravels (30%). No odour, staining or fibre cement material noted.		
0.2		BH401_0.5-0.6		0.4					
				0.6					
				0.8					
0.5		BH401_1.0-1.15		1.0			Becoming medium dense from 1.0 m bgs.		
				1.2					
				1.4					
				1.6					
				1.8					
				2.0		FILL	Sandy Gravel FILL. Pale orange/brown, very dense, slightly moist. Contains weathered sandstone and sandstone boulders (80%), concrete, charcoal and traces of timber (20%). No odour, staining or fibre cement material noted.	2.00	
0.6		BH401_2.0-2.4		2.2					
				2.4			Groundwater encountered at 2.5 m bgs.		
				2.6					
				2.8					
				3.0		FILL	Silty Sand FILL. Dark grey, medium dense, saturated. Contains fine sand and silt (70%), brick and concrete gravels, grass and timber and one copper nut. No odour, staining or fibre cement material noted.	3.00	
0.4		BH401_3.0-3.4	✳	3.2					
				3.4					
				3.6					
				3.8					
				4.0		FILL	Gravel FILL. Red, medium dense, saturated. Contains medium to coarse sand (20%), traces of glass and timber fragments, red brick rubble (80%). No odour, staining or fibre cement material noted.	4.00	Blank Casing
1.5		BH401_4.0-4.4		4.2					
				4.4					
				4.6					
				4.8					
				5.0		FILL	Sandy Clay/Gravel FILL. Dark grey, medium dense, saturated, low plasticity. Contains fine sub angular/angular gravels consisting of basalt, brick, sandstone, bitumen (50%), dark grey sandy clay (50%), traces of timber and glass. Recovery 100 mm. No odour, staining or fibre cement material noted.	5.00	
1.9		BH401_5.0-5.4	✳	5.2					
				5.4					
				5.6					
				5.8					
				6.0		FILL	Silty Sand/Gravel FILL. White/dark grey, medium dense, saturated. Contains medium to coarse crushed white brick gravels with minor basalt (70%), fine to coarse grained sand and silt (30%), traces of timber fragments. Recovery 100 mm. No odour, staining or fibre cement material noted.	6.00	
1		BH401_6.0-6.4		6.2					
				6.4					
				6.6					
				6.8					
				7.0		FILL	Gravelly Sand FILL. Dark grey, medium dense, saturated. Contains fine to medium grained sand with silt (60%), gravels of brick, concrete, sandstone, quartz and terracotta tiles (40%). Recovery 100 mm. No odour, staining or fibre cement material noted.	7.00	Cement
0.9		BH401_7.0-7.4		7.2					
				7.4					
				7.6					
				7.8					

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

MONITORING WELL LOG BH401 / MW401

PROJECT NUMBER 60153531 **DATE** 11 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.47 m

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.6		BH401_8.0-8.4		8.2		FILL *(Continued)*	Gravelly Sand FILL. Dark grey, medium dense, saturated. Contains fine to medium grained sand with silt (60%), gravels of brick, concrete, sandstone, quartz and terracotta tiles (40%). Recovery 100 mm. No odour, staining or fibre cement material noted. *(Continued)*		
				8.4			Becoming grey/brown with red brick inclusions from 7.0 m bgs. Contains fine to medium sand (60%), gravels of crushed brick with sandstone (40%). Recovery 100 mm. No odour, staining or fibre cement material noted.		
		BH401_9.0-9.4	✳	8.6			Becoming gravels of brick, concrete, bitumen, rubble (50%), medium to fine grained sand (50%) from 9.0 m bgs. Mild hydrocarbon odour. No staining or fibre cement material noted.		
				8.8					
				9.0					
				9.2					
				9.4					
				9.6					
				9.8					
				10.0				10.00	
1.5		BH401_10.0-10.4	✳	10.2		FILL	Clayey Sandy Gravel FILL. Grey brown, medium dense, saturated. Contains angular gravels (60%), medium grained sand (30%), minor clay (10%). Contains brick, concrete, sandstone and bitumen rubble. Recovery 100 mm. Mild hydrocarbon odour. No staining or fibre cement material noted.		
				10.4					
				10.6					
				10.8					
				11.0				11.00	
1.5		BH401_11.0-11.4	✳	11.2		FILL	Gravelly Sand FILL. Dark grey/brown, very dense, saturated. Contains fine/medium grained sand (50%), gravels of angular basalt, crushed concrete and brick, quartz, river pebbles and sandstone (50%). Very mild hydrocarbon odour. No staining or fibre cement material noted.		
				11.4					
				11.6					
				11.8					
				12.0					
1.4		BH401_12.0-12.4		12.2			Becoming medium dense, brown/grey and black from 12.0 m bgs. Contains medium grained sand, sub angular basalt gravels, weathered sandstone, trace clays. Recovery 100 mm. No odour, staining or fibre cement material noted.		
				12.4					
				12.6					
				12.8					
				13.0				13.00	
1.4		BH401_13.0-13.4	✳	13.2		FILL	Sand FILL. Dark grey/brown, medium dense, saturated. Contains fine to medium grained sand with minor sub angular gravels. Very mild hydrocarbon odour. No staining or fibre cement material noted.		
				13.4					
				13.6					
				13.8					
				14.0				14.00	
1.6		BH401_14.0-14.2	✳	14.2		OH	SILTY CLAY. Grey/black, soft, saturated. Contains shells and has a spongy texture. No odour, staining or fibre cement material noted.	14.20	Bentonite
2.4		BH401_14.2-14.4				SC	CLAYEY SAND. Dark orange, dense, saturated. Contains highly weathered sandstone, fine to medium grained sand, minor clay. No odour, staining or fibre cement material noted.		
				14.4					
				14.6					
				14.8					
				15.0				15.00	
4.2		BH401_15.0-15.4		15.2		SC	CLAYEY SAND - CLAY. Mottled dark orange/red/pale grey, medium dense, saturated, low plasticity. Contains fine to medium grained sand with clay, highly weathered sandstone and bands of sandy clay. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				15.4					
				15.6					
				15.8					
				16.0				16.00	
1.5		BH401_16.0-16.4		16.2		SC	CLAYEY SAND. Dark orange and pale grey, medium dense, saturated. Contains fine to medium grained sand and highly weathered sandstone. No odour, staining or fibre cement material noted.		
				16.4					
				16.6					

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

MONITORING WELL LOG BH401 / MW401

PROJECT NUMBER 60153531 **DATE** 11 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.47 m

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				17.0		SC *(Continued)*	CLAYEY SAND. Dark orange and pale grey, medium dense, saturated. Contains fine to medium grained sand and highly weathered sandstone. No odour, staining or fibre cement material noted. *(Continued)*		
15.4		BH401_17.0-17.4	✳	17.2			Mild hydrocarbon odour noted and one small circle (10 mm) of black staining at 17.0 m bgs		38 mm Slotted Screen
				17.4					
				17.6					
				17.8					
				18.0			Becoming pale grey/pink-orange, with sandy clay bands from 18.0 m bgs.		
7		BH401_18.0-18.4 QC663 QC664		18.2					
				18.4					
				18.6					
				18.8					
				19.0					
				19.2		CL	SANDY CLAY. Pale grey/yellow, stiff, saturated, low plasticity. Contains fine to medium grained sand, clay with weathered sandstone. Hydrocarbon odour. Black tar veins increasing with depth. No fibre cement material noted.	19.20	
112.4		BH401_19.2-19.4	✳	19.4					
				19.6					
				19.8					
				20.0		SC	CLAYEY SAND. White/yellow, medium dense-dense, saturated. Contains slightly weather sandstone. Very mild hydrocarbon odour. No staining of fibre cement material noted.	20.00	
5		BH401_20.0-20.15	✳				Refusal of SPT at 20.15 m bgs on sandstone bedrock. Total Depth: 20.15 m	20.15	Bentonite

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH402

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD Hand Auger / SPT
SURFACE ELEVATION 2.610 m AHD

DATE 9 - 10 Feb 2011

LOGGED BY K. O'Brien / L. Kontus
COMMENTS

NORTHING 6251734.066
EASTING 333674.472

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0		ASPHALT	ASPHALT	0.10
				0.2		FILL	Gravelly Sand FILL. Pale brown, loose to medium dense, dry. Contains fine to medium grained sand with some coarse grained sand (50%), sandstone and basalt gravels (50%). No odour, staining or fibre cement material noted.	
0	☒	BH402_0.5-0.6		0.4			Traces of crushed tile, brick and glass encountered at 0.5 m bgs	
				0.6				
0	☒	BH402_1.0-1.1 QC650 QC651		0.8			Becoming dark yellow/brown and loose from 1.0 m bgs. Contains inclusions of broken tile, glass and brick (40%) with a piece of copper wire, tag and a glass bottle neck. No odour, staining or fibre cement material noted.	
				1.0				
				1.2				
				1.4				
				1.6				
				1.8				
				2.0 ▽				2.00
				2.2		FILL	Silty Clay FILL. Brown, medium stiff to stiff, saturated, medium plasticity. Contains minor sand, inclusions of brick rubble, road base gravels and shale fragments. Recovery 70 mm, not enough to sample. No odour, staining or fibre cement material noted.	
				2.4				
				2.6			Groundwater encountered at 2.0 m bgs.	
				2.8				
				3.0			Becoming red/brown, very moist from 3.0 m bgs. Contains brick rubble (95%), silty sand (5%) trace road base gravels, trace bark. Insufficient recovery to sample. No odour, staining or fibre cement material noted.	
				3.2				
				3.4				
				3.6				
				3.8				
				4.0				4.00
4.9	■	BH402_4.0-4.2	✳	4.2		FILL	Silty Sand FILL. Dark grey, saturated. Contains minor clay (10%), sandstone and brick rubble (40 mm). Recovery 200 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				4.4				
				4.6				
				4.8				
0.9	■	BH402_5.0-5.2		5.0			Becoming brown, medium dense from 5.0 m bgs. Contains brick rubble (60%) and weathered sandstone. No odour, staining or fibre cement material noted.	
				5.2				
				5.4				
				5.6				
				5.8				
				6.0			Recovery of 70 mm at 6.0 m bgs comprises bricks and gravels, concrete chunks (95%), silty sand (5%). Not enough recovery to sample.	
				6.2				
				6.4				
				6.6				
				6.8				
				7.0			Not indicative of conditions - no sample recovery at 7.0 m bgs due to nature of fill, i.e. sandstone/brick in fill.	
				7.2				
				7.4				
				7.6				
				7.8				
				8.0				
1	■	BH402_8.0-8.2		8.2			Becoming dark brown to black, dense to very dense, very moist from 8.0 m bgs. Contains fine grained sand (60%), brick rubble (40%). No odour, staining or fibre cement material noted.	
				8.4				
				8.6				
				8.8				
				9.0				9.00
1.6	■	BH402_9.0-9.3	✳	9.2		FILL	Gravelly Silty Sand FILL. Red coloured brick, dark brown soil, dense to very dense, moist. Contains fine grained sand, road base gravels, large red brick fragments, shale fragments and a piece of hard white plastic. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				9.4				
				9.6				
				9.8				10.00

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH402

PROJECT NUMBER 60153531 **DATE** 9 - 10 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.8		BH402_10.0-10.2		10.0		FILL	Silty Sand FILL. Dark brown, medium dense, moist. Contains medium grained sand, concrete gravels, weathered sandstone, minor brick rubble, minor road base gravels, a yellow terracotta fragment (30mm). No odour, staining or fibre cement material noted.	
0.9		BH402_11.0-11.2	✳	11.0			Becoming light grey grading to light brown, fine to medium grained from 11.0 m bgs. Contains sandstone (30 mm), brick rubble, weathered sandstone, minor clay (<10%). Recovery 250 mm. No odour, staining or fibre cement material noted.	
1.2		BH402_12.0-12.1		12.0			Becoming red grading to brown/yellow from 12.0 m bgs. Contains brick and concrete rubble (50%), red sand (40%), minor silt (10%). Recovery 250 mm. No odour, staining or fibre cement material noted.	
3.6		BH402_13.0-13.2		13.0			Becoming brown grading to black from 13.0 m bgs. Contains brick and concrete rubble (80%), soil (20%). Recovery 200 mm. Hydrocarbon odour. No staining or fibre cement material noted.	
106.5		BH402_14.0-14.5 QC604 QC605	✳	14.0		CL-CH	SILTY SANDY CLAY. Mottled grey and yellow, medium stiff, moist, medium plasticity. Contains weathered sandstone/reworked clay. Hydrocarbon odour. Sheen observed on soil, ~10% tar content, black staining (50%). No fibre cement material noted.	14.00
959		BH402_15.0-15.5	✳	15.0		SP-SC	CLAYEY SILTY SAND. Mottled, medium stiff, moist, medium plasticity. Contains weathered sandstone, residual clay. Hydrocarbon odour. ~30% black staining with ~10% tar content. No fibre cement material noted. Becoming dark yellow/red weathered sandstone from 15.4 m bgs.	15.00
2297		BH402_16.0-16.3	✳	16.0			Becoming mottled grey and brown, stiff, medium dense from 16.0 m bgs. Contains weathered sandstone, residual clay. Tar through matrix of sample. 300mm recovery, first 250 mm <10% tar containing material, last 50 mm >10% tar containing material. Hydrocarbon odour, black staining and sheen observed on soil. No fibre cement material noted.	
2047		BH402_17.0-17.4 QC606 QC607	✳	17.0			Becoming light to dark grey/black at base of SPT, dense from 17.0 m bgs. Contains residual clay and weathered sandstone. 400 mm recovery >10% tar containing material. Very strong hydrocarbon odour. No fibre cement material noted.	
829		BH402_18.1-18.3		18.0			Becoming mottled brown/grey to black (70% tar containing material) to brown, very dense from 18.0 m bgs. 450mm recovery comprising 18.1-18.3 >70%tar containing material, 18.4 ~40% tar containing material. Very strong hydrocarbon odour and slight sheen observed on soil. No fibre cement material noted.	
101.2		BH402_19.1-19.4	✳	19.0		CL	SILTY CLAY. Mottle red/yellow, stiff, moist, low plasticity. Contains residual clay with some weathered sandstone. Recovery 500 mm. <10% tar containing material with large globules in matrix. Strong hydrocarbon odour and sheen observed on soil. No fibre cement material noted.	19.00
				19.8			Refusal on sandstone bedrock at 19.8 m bgs, borehole terminated. Total Depth: 19.80 m	19.80

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH403

PROJECT NUMBER 60153531 **DATE** 9 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD Grab / Hand Auger / SPT
SURFACE ELEVATION 2.360 m AHD

LOGGED BY K. O'Brien **NORTHING** 6251700.264
COMMENTS **EASTING** 333673.623

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.0		ASPHALT	ASPHALT	0.09
				0.2		FILL	Gravelly Sand FILL. Grey/brown, medium dense, dry. Contains fine to medium grained sand (50%), minor silt (10%), sandstone, brick and road base gravels, sandstone cobbles (40%), minor black bituminous gravels. No odour, staining or fibre cement material noted.	
0.4		BH403_0.4-0.5		0.4				
				0.6				
				0.8				
0.9		BH403_1.0-1.1		1.0			Becoming white with brown, medium dense to dense, medium grained sand and sandstone gravels from 1.0 m bgs. No odour, staining or fibre cement material noted.	
				1.2				
				1.4				
				1.6				
				1.8				
				2.0				
0		BH403_2.0-2.4		2.2			Becoming dark grey and dark orange, medium dense, saturated, medium to coarse sand with silt and traces of shell (70%), sub rounded sandstone gravel from 2.0 m bgs. No odour, staining or fibre cement material noted.	
				2.4				
				2.6				
				2.8				
0		BH403_3.0-3.4		3.0			Becoming dark grey, loose, angular basalt gravel (50%), fine to coarse sand with traces of shell from 3.0 m bgs. Mild hydrocarbon odour. No staining or fibre cement material noted.	
				3.2				
				3.4				
				3.6				
				3.8				
				4.0				
1.9		BH403_4.0-4.4		4.2			Becoming medium dense, medium to coarse sand (60%), sub angular gravels (40%) with clear glass fragments and timber shards from 4.0 m bgs. Mild hydrocarbon odour and black staining. No fibre cement material noted.	
				4.4				
				4.6				
				4.8				
				5.0		FILL	Sand FILL. Dense, saturated. Contains medium to coarse grained sand (basalt like rock) and crushed brick fragments. Mild hydrocarbon odour and black staining. No fibre cement material noted.	5.00
0.7		BH403_5.0-5.4		5.2				
				5.4				
				5.6				
				5.8				
				6.0		FILL	Sandy Gravel/Sandy Clay FILL. Grey/orange brown/pink/black, medium dense, saturated. Contains fine grained crushed weathered sandstone (70%), sandy clay (30%). Mild hydrocarbon odour. No staining or fibre cement material noted.	6.00
0.6		BH403_6.0-6.4		6.2				
				6.4				
				6.6				
				6.8				
				7.0			No recovery of SPT sample at 7.0 m bgs.	
				7.2				
				7.4				
				7.6				
				7.8				
				8.0		OH	SILTY SAND. Very dark to grey, very soft, saturated, high plasticity. Contains organic marine sediment (peaty, spongy texture), shells, wood. Mild hydrocarbon odour. No staining or fibre cement material noted.	8.00
8.2		BH403_8.0-8.4 QC656		8.2				
				8.4				
				8.6				
				8.8				
								9.00

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH403

PROJECT NUMBER 60153531 **DATE** 9 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
125.4		BH403_9.0-9.4 QC657		9.2		CL	SANDY CLAY. Orange, stiff, saturated with low plasticity. Contains fine grained sand, tar veins and globules (>10%). Strong hydrocarbon odour with black and olive green staining. No fibre cement material noted.	
				9.4				
				9.6				
				9.8				
				10.0				
256		BH403_10.0-10.4	✳	10.2			Becoming dark orange with yellow and black from 10.0 m bgs. Strong hydrocarbon odour. Greater than 10% tar and increasing with depth. No fibre cement material noted.	
				10.4				
				10.6				
				10.8				
				11.0				
239		BH403_11.0-11.4 QC658 QC659		11.2			Very strong hydrocarbon odour at 11.0 m bgs with increasing tar content.	
				11.4				
				11.6				
				11.8				
				12.0				
1239		BH403_12.0-12.4	✳	12.2			Tar content greater than 30% at 12.0 m bgs	
				12.4				
				12.6				
				12.8				
				13.0		CLS	CLAYEY SAND to SANDY CLAY. Dark orange/red, very moist, low plasticity. Contains fine sand (50%). Greater than 20% tar. Strong hydrocarbon odour. Black and grey staining. No fibre cement material noted.	13.00
438		BH403_13.0-13.4 QC660 QC661		13.2				
				13.4				
				13.6				
				13.8				
				14.0		CL	SANDY CLAY. Pale grey, very moist, low plasticity. Contains fine grained sand (50%), >20% tar with veins and globules. Strong hydrocarbon odour and black staining. No fibre cement material noted.	14.00
422		BH403_14.0-14.4		14.2				
				14.4				
				14.6				
				14.8				
				15.0			Becoming pale grey/orange and black from 15.0 m bgs.	
509		BH403_15.0-15.4	✳	15.2				
				15.4				
				15.6				
				15.8				
				16.0		CLS	SILTY SANDY CLAY. Brown and red mottled, saturated, low plasticity. Contains sand (40%), tar (>20%) with veins and globules. Strong hydrocarbon odour and staining. No fibre cement material noted.	16.00
1120		BH403_16.0-16.4	✳	16.2				
				16.4				
				16.6				
				16.8				
				17.0		SANDSTONE	SANDSTONE. White/pink slightly weathered fine grained sandtone. Contains tar veins finer than above. Hydrocarbon odour and staining. No fibre cement material noted.	17.00
440		BH403_17.0-17.3	✳	17.2				17.30
							Refusal of SPT on bedrock at 17.3 m bgs. Total Depth: 17.30 m	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH404

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD Grab / Hand Auger / SPT
SURFACE ELEVATION 2.070 m AHD

DATE 9 Feb 11

LOGGED BY K. O'Brien
COMMENTS

NORTHING 6251676.484
EASTING 333666.503

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.2		ASPHALT	ASPHALT.	0.11
				0.4		FILL	Gravelly Sand FILL. Grey brown, medium dense, dry, Contains fine to medium grained sand with silt (60%), sub angular sandstone, brick and roadbase gravels (40%). Mild hydrocarbon odour. No staining or fibre cement material noted.	
0.5		BH404_0.4-0.5	✳	0.6				
				0.8				
0.9		BH404_1.0-1.1		1.0			As above. No odour, staining or fibre cement material noted from 1.0 m bgs. Contains sandstone cobbles and boulders from 1.15 m bgs.	
				1.2				
				1.4				
				1.6				
				1.8				
				2.0 ▽				
0.1		BH404_2.0-2.4		2.2			Becoming dark grey, saturated from 2.0 m bgs. Contains fine to medium grained sand with silt (50%), angular/sub angular gravels (50%) with one cobble sized basalt gravel. No odour, staining or fibre cement material noted.	
				2.4				
				2.6				
				2.8				
				3.0		FILL	Gravel FILL. Dark grey/orange, loose, saturated. Contains gravel of brick and metallic grey slag. No odour, staining or fibre cement material noted.	3.00
		BH404_3.0-3.4		3.2				
				3.4				
				3.6				
				3.8				
				4.0		FILL	Gravelly Sand FILL. Dark orange, medium dense, saturated. Contains fine to medium dark grey sand (50%), sub angular roadbase/slag gravels (50%). No odour, staining or fibre cement material noted.	4.00
0.1		BH404_4.0-4.4	✳	4.2				
				4.4				
				4.6				
				4.8				
				5.0		FILL	Gravel FILL. Grey/brown, loose, saturated. Contains sub angular gravels of basalt, concrete, sandstone and brick. No odour, staining or fibre cement material noted.	5.00
				5.2				
				5.4				
				5.6				
				5.8				
				6.0		FILL	Gravelly Sand FILL. Very dark grey, dense, saturated. Contains medium to coarse grained sand, sandstone gravel, concrete, slag . No odour, staining or fibre cement material noted.	6.00
0.2		BH404_6.0-6.4		6.2				
				6.4				
				6.6				
				6.8				
				7.0		FILL	Clayey Sandy Gravel FILL. Very dark grey, very dense, saturated. Contains angular dark grey gravel (50%), fine to medium grained sand with minor clay. Hydrocarbon odour and sheen. No fibre cement material noted.	7.00
0.4		BH404_7.0-7.4	✳	7.2				
				7.4				
				7.6				
				7.8				
				8.0		FILL	Sample washed out at 8.0 m bgs. Poor recovery of 20 mm clay and two pieces of coarse sandstone gravel. No odour, staining or fibre cement material noted.	8.00
				8.2				
				8.4				
				8.6				
				8.8				9.00

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH404

PROJECT NUMBER 60153531 **DATE** 9 Feb 11
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2		BH404_9.0-9.4		9.2		FILL	Gravelly Sand FILL. Dark yellow/brown, dense, saturated. Contains fine to medium grained sand (70%), sandstone gravel (30%). No odour, staining or fibre cement material noted.	
				9.4				
				9.6				
				9.8				
				10.0				
		BH404_10.0-10.4		10.2			Becoming dark yellow/orange/grey, medium dense from 10.0 m bgs. Contains medium grained sand (60%), coarse sandstone gravel (40%). No odour, staining or fibre cement material noted.	
				10.4				
				10.6				
				10.8				
				11.0				
				11.2			Becoming grey brown from 11.0 m bgs. Contains fine to medium grained sand with minor sub angular sandstone gravels. No odour, staining or fibre cement material noted.	
				11.4				
				11.6				
				11.8				
				12.0				12.00
0.2		BH404_12.0-12.4 QC652	✳	12.2		FILL	Sand FILL. Dark grey, loose, saturated. Contains medium grained marine sand (80%) and sandstone gravel fragments (20%). Hydrogen sulphide odour. No staining or fibre cement material noted.	
				12.4				
				12.6				
				12.8				
				13.0				13.00
0.5		BH404_13.0-13.4		13.2		FILL	Gravelly Sand FILL. Dark grey, medium dense, saturated. Contains medium grained sand (50%) with sandstone, brick and basalt gravels (50%). No odour, staining or fibre cement material noted.	
				13.4				
				13.6				
				13.8				
				14.0				14.00
0.4		BH404_14.0-14.4 QC653 QC654	✳	14.2		FILL	Sandy Silty Clay FILL. Very dark grey to black, medium stiff, saturated, high plasticity. Contains minor shell, fine grained sand (decreasing in content with depth), marine sediment. Hydrocarbon odour and staining. No fibre cement material noted.	
				14.4				
				14.6				
				14.8				
				15.0				15.00
20.1		BH404_15.0-15.4	✳	15.2		FILL	Silty Clay FILL. Very pale grey to white, very stiff, very moist, medium plasticity. Contains bands of residual sandy silty clay and residual clay. Hydrocarbon odour and inclusions of tar (<10 %) in residual clay. No fibre cement material noted.	
				15.4				
				15.6				
				15.8				
				16.0				16.00
							SPT refusal at 16.0 m bgs in sandstone bedrock. Total Depth: 16.00 m	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH405 / IT03

PROJECT NUMBER	60153531	**DATE**	3, 10 - 11 Feb 2011
PROJECT NAME	VMP Additional DGI	**BLANK**	0.0 to 2.5 m bgs, 0.0 to 7.9 m bgs, 0.0 to 13.5 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	3.5 to 4.5 m bgs, 7.9 to 8.9 mbgs, 13.5 to 14.5 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	2.0 to 4.1 m bgs, 7.5 to 9.1 m bgs, 12.9 to 14.5 m bgs
SAMPLING METHOD	SPT	**SANITARY SEAL/BENTONITE**	0.0 to 2.0 m bgs, 7.0 to 7.5 m bgs, 12.3 to 12.9 m
SURFACE ELEVATION	2.590 m AHD	**STABILISED WATER LEVEL**	2.320 m BTOC
WELL HEAD/TOC	2.48 m AHD	**GROUND WATER ELEVATION**	0.160 m AHD
LOGGED BY	L. Kontus	**NORTHING**	6251645.5
COMMENTS	IT03 - nested intertidal monitoring well	**EASTING**	333677.2

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.0		CONCRETE	Concrete Slab	0.07
				0.2		FILL	Sandy Gravel FILL. Brown, very dense. Roadbase gravels. No odour, staining or fibre cement material noted. Large sandstone boulder at 0.6 m bgs.	
1.5		BH405_1.1-1.4		1.0		FILL	Silty Sand FILL. Mottled white/red/grey, loose, dry. Contains fine grained weathered sandstone. No odour, staining or fibre cement material noted.	1.00
				2.0		FILL	Gravelly Silty Sand FILL. Brown, loose, saturated. Contains sandstone and roadbase gravels. Recovery 100 mm. No odour staining or fibre cement material noted.	2.00
0.5		BH405_3.0-3.1		3.0		FILL	Silty Sand FILL. Light and dark grey, medium dense, saturated. Contains minor clay and sandstone gravels. Recovery 150 mm. No odour, staining or fibre cement material noted.	3.00
1.6		BH405_4.0-4.3	✳	4.0			Becoming grey/brown from 4.0 m bgs. Contains wood, sandstone gravels (40%, <30 mm), roadbase gravels (5-40 mm) and minor brick gravels (<30 mm). No odour, staining or fibre cement material noted.	
				5.0		FILL	Sand FILL. Brown, loose, saturated. Contains minor silt and sandstone gravels, timber chunks, and brick rubble (60%). Recovery 80 mm. No odour, staining or fibre cement material noted.	5.00
		BH405_6.0-6.1		6.0		FILL	Silty Sand FILL. Brown, loose, saturated. Contains sandstone gravels, concrete and brick rubble, shale fragments. No odour, staining or fibre cement material noted.	6.00
1.2		BH405_7.0-7.3	✳	7.0			Becoming mottled red/white/grey, medium dense, moist from 7.0 m bgs. Contains (80%) weathered sandstone and sandstone gravels. Recovery 30 mm. No odour, staining or fibre cement material noted.	8.00

WELL DIAGRAM: Cement; Bentonite; Graded Sand Filter Pack; IT03S - Shallow Sampling Point; Bentonite; Graded Sand Filter Pack; Bentonite; Graded Sand Filter Pack; PVC casing; Bentonite; Graded Sand Filter Pack

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH405 / IT03

PROJECT NUMBER 60153531 **DATE** 3, 10 - 11 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.27 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.8		BH405_8.0-8.2		8.2		FILL	Sand FILL. Brown, medium dense, moist. Contains medium grained sand, brick rubble (<20%), rounded pebble fragments. Recovery 200 mm. No odour, staining or fibre cement material noted.		38 mm Slotted Screen; IT03M - Mid Sampling Point
				8.4					
				8.6					
				8.8					
				9.0				9.00	
0.8		BH405_9.1-9.3		9.2		FILL	Silty Sand FILL. Dark brown, dense, moist. Contains (20%) brick rubble and sandstone gravels. No odour, staining or fibre cement material noted.		Bentonite
				9.4					
				9.6					Graded Sand Filter Pack
				9.8					
				10.0			SPT refusal at 10.0 m bgs.		
				10.2					
				10.4					Bentonite
				10.6					
				10.8					
				11.0			Recovery of 200 mm comprises red crushed brick material from 11.0 m bgs. No odour, staining or fibre cement material noted. Not enough recovery for sample.		
				11.2					
				11.4					Graded Sand Filter Pack
				11.6					
				11.8					
				12.0				12.00	
0.1		BH405_12.0-12.2	✳	12.2		FILL	Silty Sand FILL. Dark brown, medium dense, moist. Contains (20%) silty sand with (80%) red brick and light grey sandstone gravels. No odour, staining or fibre cement material noted.		Bentonite
				12.4					
				12.6					
				12.8					
				13.0				13.00	
197.7		BH405_13.0-13.2	✳	13.2		SM	SAND. Dark grey, medium dense, moist. Contains sand with minor silt. Recovery 250 mm. Strong hydrocarbon odour. No staining or fibre cement material noted.		Graded Sand Filter Pack
				13.4					
				13.6					
				13.8					
				14.0				14.00	
467.2		BH405_14.0-14.4 QC609	✳	14.2		SW-SC	SILTY SANDY CLAY. Grey grading to orange, dense, moist. Contains residual clay with weathered sandstone. Recovery 400 mm. Hydrocarbon odour. No staining or fibre cement material noted.		IT03D - Deep Sampling Point
				14.4			Increased hardness in weathered orange sandstone at 14.15 m bgs.	14.45	
							SPT refusal on sandstone bedrock at 14.45 m bgs. Total Depth: 14.45 m		

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH406

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD SPT
SURFACE ELEVATION 2.720 m AHD

DATE 3, 8 - 9 Feb 2011

LOGGED BY L. Kontus
COMMENTS

NORTHING 6251630.583
EASTING 333656.536

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.0		CONCRETE	Concrete Slab	0.10
				0.2		FILL	Sandy Gravel FILL. Brown, medium dense, very moist (due to coring). Roadbase gravels. No odour, staining or fibre cement material noted.	
				0.4				
				0.6		CONCRETE	Solid concrete at 0.6 m bgs.	0.60
				0.8				
1.1		BH406_1.0-1.1		1.0		FILL	Silty Clay Gravel FILL. Brown, very dense, very moist. Contains minor sand in silty clay, concrete and roadbase gravels. Sample is (~60%) gravels and concrete due to lack of recovery. No odour, staining or fibre cement material noted.	1.00
				1.2				
				1.4				
				1.6				
				1.8				
				2.0 ▽				2.00
0.6		BH406_2.0-2.2		2.2		FILL	Silty Sandy Gravel FILL. Brown, very dense, saturated. Contains silty sand, brick and concrete rubble, sandstone and roadbase gravels. No odour, staining or fibre cement material noted.	
				2.4				
				2.6				
				2.8				
0.6		BH406_3.0-3.2		3.0			Becoming brown and grey, medium dense, very moist to saturated from 3.0 m bgs. Sample is mainly gravels. No odour, staining or fibre cement material noted.	
				3.2				
				3.4				
				3.6				
				3.8				
0.8		BH406_4.0-4.2	✳	4.0			Becoming dark grey from 4.0 m bgs. Silty clay inclusions, medium stiff, medium dense, very moist to saturated, medium plasticity. Containsbrick rubble (<60 mm) and roadbase gravels. Slight Hydrogen sulphide odour. No staining or fibre cement material noted.	
				4.2				
				4.4				
				4.6				
				4.8				
				5.0		FILL	Silty Gravel FILL. Brown/grey, very dense, very moist to saturated. Contains minor sand, gravels (<15 mm), wood chunks and roadbase gravels. No odour, staining or fibre cement material noted. Not enough recovery for sample. No odour, staining or fibre cement material noted.	5.00
				5.2				
				5.4				
				5.6				
				5.8				
				6.0		FILL	Silty Sandy Gravel FILL. Brown, medium dense, saturated. Contains organic material (wood), roadbase gravel and brick rubble. No odour, staining or fibre cement material noted. Not enough recovery to sample.	6.00
				6.2				
				6.4				
				6.6				
				6.8				
0.8		BH406_7.0-7.2	✳	7.0			Becoming very dense from 7.0 m bgs. Contains roadbase gravel and brick rubble.	
				7.2				
				7.4				
				7.6				
				7.8				
				8.0		FILL	Sand FILL. Dark grey, loose, very moist. Contains medium to coarse grained sands, rounded sandstone gravels. No odour, staining or fibre cement material noted.	8.00
0.8		BH406_8.0-8.5 QC600 QC601		8.2				
				8.4				
				8.6				
				8.8				

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH406

PROJECT NUMBER 60153531 **DATE** 3, 8 - 9 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				9.2		FILL *(Continued)*	Sand FILL. Dark grey, loose, very moist. Contains medium to coarse grained sands, rounded sandstone gravels. No odour, staining or fibre cement material noted. *(Continued)*	
				9.4			Becoming medium dense from 9.0 m bgs. Contains medium to coarse grained marine sands, rounded grey/brown sandstone gravels (<35 mm) and metal shard. No odour staining or fibre cement material noted.	
				9.6				
				9.8				
				10.0				
1.2		BH406_10.0-10.3	✳	10.2			Becoming light grey grading to dark grey (last 30 mm dark grey) from 10.0 m bgs. Contains (<20%) marine sands, sandstone cobbles and weathered sandstone. No odour, staining or fibre cement material noted.	
				10.4				
				10.6				
				10.8				
				11.0				11.00
				11.2		FILL	Silty Sand FILL. Brown, medium dense, saturated. Contains marine sand with (80%) red brick and white sandstone gravels. Recovery 130 mm, not enough to sample. No odour, staining or fibre cement material noted.	
				11.4				
				11.6				
				11.8				
				12.0				
1.4		BH406_12.0-12.1		12.2			As above, with (60%) red brick and sandstone gravels (<40 mm) from 12.0 m bgs. Recovery 100 mm, sample jar only 50% full (headspace filled with sand and brick gravels). No odour, staining or fibre cement material noted.	
				12.4				
				12.6				
				12.8				
				13.0				
1		BH406_13.0-13.2		13.2			Becoming light and dark grey, dense, very moist from 13.0 m bgs. Contains weathered sandstone with (~50%) sandstone and brick gravels. Recovery 250 mm. No odour, staining or fibre cement material noted.	
				13.4				
				13.6				
				13.8				
				14.0				14.00
				14.2		FILL	Silty Clay FILL. Dark grey/black, soft, very moist to saturated, medium to high plasticity. Contains minor sands with some tree roots, brick and sandstone gravels (20%). Recovery 450 mm. Hydrocarbon odour and band of tar noted at 14.29 - 14.50 m bgs. No fibre cement material noted.	
24.4		BH406_14.0-14.4	✳	14.4				
				14.6				
				14.8				
				15.0				15.00
				15.2		CL-CH	SILTY CLAY. Mottled brown/red/grey, soft, very moist, medium to high plasticity. Contains reworked, natural residual clay with minor sand. Very strong hydrocarbon odour. Tar observed (~20%) throughout matrix. No fibre cement material noted.	
946		BH406_15.0-15.4 QC602 QC603	✳	15.4				
				15.6				
				15.8				
				16.0				16.00
				16.2		SP-SM	SILTY SAND. Mottled red/brown/yellow, medium dense, very moist. Contains weathered sandstone with minor clay content. Very strong hydrocarbon odour and sheen observed on soil. Tar observed (~30%) throughout matrix. No fibre cement material noted.	
3010		BH406_16.0-16.5	✳	16.4				
				16.6				
				16.8				16.80
							SPT refusal on sandstone bedrock at 16.8 m bgs. Total Depth: 16.80 m	

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH407

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD SPT
SURFACE ELEVATION 2.120 m AHD

DATE 3, 11, 14 Feb 2011

LOGGED BY L. Kontus
COMMENTS

NORTHING 6251583.373
EASTING 333653.625

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.0		CONCRETE	Concrete Slab	0.13
				0.2		FILL	Sandy Gravel FILL. Brown, very dense, very moist (from coring). Roadbase gravels. No odour, staining or fibre cement material noted.	
				0.4				
				0.6			Large sandstone boulders at 0.65 m bgs.	
				0.8				
				1.0			Sandstone rubble from 0.9 m bgs	1.00
1.2		BH407_1.0-1.3		1.2		FILL	Silty Sand FILL. Brown/grey medium dense, dry. Contains (40%) hard sandstone, some shale. No odour, staining or fibre cement material noted.	
				1.4				
				1.6				
				1.8				
				2.0				2.00
				2.2		FILL	Gravelly Silty Sand FILL. Light grey, medium dense, saturated. Contains (30%) sandstone gravels with minor clay content. Recovery 50 mm, not enough for sample. No odour, staining or fibre cement material noted.	
				2.4				
				2.6				
				2.8				
				3.0			Becoming sandstone gravels (95%) from 3.0 m bgs. Recovery 100 mm, too high proportion of gravel to sample. No odour, staining or fibre cement material noted.	
				3.2				
				3.4				
				3.6				
				3.8				
				4.0			Becoming brown sandstone gravels (95%, 2-30 mm) from 4.0 m bgs. Recovery 100 mm, too high proportion of sandstone to sample. No odour, staining or fibre cement material noted.	
				4.2				
				4.4				
				4.6				
				4.8				
0.8		BH407_5.0-5.1		5.0			Becoming light grey, dense, moist from 5.0 m bgs. Contains weathered sandstone and sandstone gravels. Recovery 100 mm. No odour, staining or fibre cement material noted.	
				5.2				
				5.4				
				5.6				
				5.8				
				6.0				6.00
				6.2		FILL	Gravelly Sand FILL. White/light grey, medium dense, saturated. Contains sand (50%) and sandstone gravels (50%). Recovery 80 mm, not enough for sample. No odour, staining or fibre cement material noted.	
				6.4				
				6.6				
				6.8				
				7.0			Becoming sandstone (95%) from 7.0 m bgs. Contains silty sand (5%). Too high proportion of sandstone to sample. No odour, staining or fibre cement material noted.	
				7.2				
				7.4				
				7.6				
				7.8				
0.3		BH407_8.0-8.1	✳	8.0			Becoming weathered sandstone (50%) from 8.0 m bgs. Contains sandstone gravels (50%). No odour, staining or fibre cement material noted.	
				8.2				
				8.4				
				8.6				
				8.8				
0.3		BH407_9.0-9.1		9.0			As above. No odour, staining or fibre cement material noted.	
				9.2				
				9.4				
				9.6				
				9.8				

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH407

PROJECT NUMBER 60153531 **DATE** 3, 11, 14 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION**

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				10.2		FILL *(Continued)*	Gravelly Sand FILL. White/light grey, medium dense, saturated. Contains sand (50%) and sandstone gravels (50%). Recovery 80 mm, not enough for sample. No odour, staining or fibre cement material noted. *(Continued)*	
				10.4			Becoming sandstone gravels (95%), very moist to saturated from 10.0 m bgs. Contains weathered sandstone (5%). Too high proportion of sandstone to sample. No odour, staining or fibre cement material noted.	
				10.6				
				10.8				
				11.0			As above. Recovery less than 100 mm. No odour, staining or fibre cement material noted.	
				11.2				
				11.4				
				11.6				
				11.8				
0.6		BH407_12.0-12.18	✳	12.0			Becoming saturated sandstone gravels (50%) with minor silt from 12.0 m bgs. Recovery 180 mm. No odour, staining or fibre cement material noted.	
				12.2				
				12.4				
				12.6				
				12.8				
				13.0				13.00
0.5		BH407_13.0-13.2		13.2		CL-CH	SILTY CLAY. Mottled brown/grey with black staining, medium stiff, moist, medium plasticity. Contains residual clay. Hydrocarbon odour. No staining or fibre cement material noted.	
				13.4				
				13.6				
				13.8				
				14.0				14.00
4		BH407_14.0-14.5 QC610 QC611	✳	14.2		SC-SM	SILTY CLAY SAND. Grey, moderately dense, saturated. Contains sand and residual clay. Recovery 200 mm with last 200 mm very soft. Hydrocarbon odour. No staining or fibre cement material noted.	
				14.4				
				14.6				
				14.8				
				15.0			Becoming mottled yellow/red/grey with increasing proportion of clay from 15.0 m bgs. Recovery 450 mm. Hydrocarbon odour. No staining or fibre cement material noted.	
10.1		BH407_15.1-15.45	✳	15.2				
				15.4				
				15.6				
				15.8				
				16.0			Becoming grey and red with increasing proportion of sand from 16.0 m bgs. Recovery 550 mm. Hydrocarbon odour. No odour, staining or fibre cement material noted.	
				16.2				
33.2		BH407_16.3-16.5	✳	16.4				
				16.6				
				16.8				
				17.0				17.00
				17.2		SP	SAND. Orange, dense to very dense, saturated. Contains sand (100%). Recovery 600 mm. Hydrocarbon odour. No staining or fibre cement material noted.	
				17.4				
20.1		BH407_17.4-17.6	✳	17.6				
				17.8				
				18.0			Becoming mottled grey/red/yellow from 18.0 m bgs. Contains sand with minor clays. Recovery 400 mm. Strong hydrocarbon odour. No staining or fibre cement material noted.	
238.8		BH407_18.0-18.3	✳	18.2				
				18.4				
				18.6				18.60
							SPT refusal on bedrock at 18.6 m bgs. Total Depth: 18.60 m	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH408

PROJECT NUMBER	60153531	**DATE**	3, 14 - 15 Feb 2011
PROJECT NAME	VMP Additional DGI		
LOCATION	Hickson Road, Millers Point NSW 2000		
DRILLING METHOD	Mud Rotary		
SAMPLING METHOD	SPT		
SURFACE ELEVATION	2.360 m AHD		
LOGGED BY	K. O'Brien / L. Kontus	**NORTHING**	6251561.644
COMMENTS		**EASTING**	333720.559

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.2		CONCRETE	Concrete Slab	0.13
				0.4		FILL	Sandy Gravel FILL. Brown, very dense, very moist (from coring). Contains roadbase gravels. No odour, staining or fibre cement material noted.	
				0.6				
				0.8			Solid brick at 0.8 m bgs.	
				1.0				1.00
0.2		BH408_1.0-1.4		1.2		FILL	Sandy Gravel FILL. Grey/yellow/reddish brown, dense, saturated. Contains crushed sandstone (50% fine-medium sand, 50% sandstone gravel). No odour. Minor black staining at 1.2 m bgs. No fibre cement material noted.	
				1.4				
				1.6				
				1.8				
				2.0				2.00
0.3		BH408_2.0-2.4	✳	2.2		FILL	Gravelly Sand FILL. Pale grey, loose, saturated. Contains fine to medium grained sand (60%), sandstone gravel (40%). No odour, staining or fibre cement material noted.	
				2.4				
				2.6				
				2.8				
				3.0				3.00
				3.2		FILL	Sandstone FILL. Pale grey, hard, saturated. Recovery 100 mm, not enough to sample. No odour, staining or fibre cement material noted.	
				3.4				
				3.6				
				3.8				
				4.0				4.00
0.3		BH408_4.0-4.4		4.2		FILL	Clayey Sandy Gravel FILL. Pale grey, medium dense, saturated. Contains (80%) fine to medium sub angular/angular shale and sandstone gravels with clayey sand (20%). No odour, staining or fibre cement material noted.	
				4.4				
				4.6				
				4.8				
				5.0				5.00
1.1		BH408_5.0-5.18		5.2		FILL	Silty Sandy Gravel FILL. Light brown/light grey, dense to very dense, saturated. Contains sandstone gravels (50%) and sand. Recovery 180 mm with majority sandstone gravels, not enough to sample. No odour, staining or fibre cement material noted.	
				5.4				
				5.6				
				5.8				
				6.0			Poor SPT Recovery, only sandstone gravels at 6.0 m bgs.	
				6.2				
				6.4				
				6.6				
				6.8				
				7.0				
				7.2				
				7.4				
				7.6				
				7.8				
				8.0				8.00
29.1		BH408_8.0-8.3 QC613 QC614	✳	8.2		CL-CH	SILTY SANDY CLAY. Brown with dark grey/black staining, soft, saturated, medium plasticity. Contains residual clay, weathered sandstone. Hydrocarbon odour. Tar containing material observed through ~20% of sample. No fibre cement material noted.	
				8.4				
				8.6				
				8.8				
				9.0		SC-SM		9.00
549.7		BH408_9.0-9.4	✳	9.2			SILTY CLAY SAND. Brown with black staining, loose, saturated. Contains residual clay, weathered sandstone. Strong hydrocarbon odour. Tar containing material ~30% through sample. No fibre cement material noted.	9.23
				9.4			Pure black tar layer with sheen at 9.23 m bgs.	9.70
				9.6			SPT refusal on bedrock at 9.7 m bgs. Total Depth: 9.70 m	

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH409

PROJECT NUMBER 60153531
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000
DRILLING METHOD Mud Rotary
SAMPLING METHOD SPT
SURFACE ELEVATION 2.630 m AHD

DATE 3, 14 - 15 Feb 2011

LOGGED BY L. Kontus
COMMENTS

NORTHING 6251555.937
EASTING 333738.101

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.0		CONCRETE	Concrete Slab	0.07
				0.2		FILL	Gravelly Sand FILL. Light brown, medium dense, moist. Contains medium grained sand and roadbase gravels. No odour, staining or fibre cement material noted.	
				0.4				
				0.6				
				0.8			Gravelly Sand FILL. Brown, medium dense, moist. Contains sandstone, brick and concrete gravels (70%, <50 mm) and minor roadbase gravels. No odour, staining or fibre cement material noted.	1.00
				1.0		FILL		
0.7		BH409_1.0-1.3		1.2			Solid asphalt boulder at 0.85 m bgs.	
				1.4			Silty Sand FILL. Brown/grey/white medium dense, dry. Contains minor clays, sandstones and roadbase gravels. No odour, staining or fibre cement material noted.	
				1.6				
				1.8				
				2.0			SPT refusal at 2.0 m bgs. Recovery consists of yellow sandstone. No odour, staining or fibre cement material noted.	
				2.2				
				2.4				
				2.6				
				2.8				
				3.0			SPT refusal at 3.0 m bgs. Coring recovery of 160 mm ironstone and sandstone. No odour, staining or fibre cement material noted.	
				3.2				
				3.4			Layer of sand with minor roadbase and sandstone gravels from 3.16 m bgs. No odour, staining or fibre cement material noted.	
				3.6				3.70
10.2		BH409_3.7-4.0	✳	3.8		FILL	Silty Clay FILL. Brown, medium stiff to stiff, saturated, medium to high plasticity. Contains minor sandstone gravels. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				4.0		FILL		4.00
2.1		BH409_4.1-4.3		4.2		SP	Silty Sand FILL. Dark grey, very loose, saturated. Contains weathered sandstone. Recovery 300 mm. No odour, staining or fibre cement material noted.	4.20
				4.4			SAND. Dark grey, very loose, saturated. Contains marine sands, 40% white shells and fine fibres (looks like hair). Organic/hydrogen sulphide odour. No staining or fibre cement material noted.	
				4.6				
				4.8				
				5.0			As above with 30% white shells from 5.0 m bgs. Recovery 300 mm. Hydrocarbon odour noted.	
107.2		BH409_5.0-5.3	✳	5.2		CL-CH		5.20
				5.4			SILTY SANDY CLAY. Grey/brown, very stiff, saturated, high plasticity. Hydrocarbon odour. No staining or fibre cement material noted.	
				5.6				
				5.8				
				6.0			SILTY SANDY CLAY. Orange/brown, medium stiff, saturated, medium plasticity. Contains residual clay/weathered sandstone, minor rootlets, trace ironstone gravels (<5 mm). Recovery 400 mm. Hydrocarbon odour. No staining or fibre cement material noted.	
23.8		BH409_6.0-6.4	✳	6.2				
				6.4				
				6.6				
				6.8				
				7.0		SC-SM	SILTY CLAY SAND. Mottled grey/brown/red, medium dense, saturated. Contains residual clay/weathered sandstone with minor ironstone gravels. Recovery 300 mm. Hydrocarbon/chemical odour. No staining or fibre cement material noted.	7.00
228.5		BH409_7.0-7.3	✳	7.2				
				7.4				
				7.6				
				7.8				7.90
							Drilling refusal on bedrock at 7.9 m bgs. Total Depth: 7.90 m	

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH410 / IT04

PROJECT NUMBER	60153531	**DATE**	10 Feb 12
PROJECT NAME	VMP Additional DGI	**BLANK**	0.1 to 2.0 m bgs, 0.1 to 16.5 m bgs, 0.1 to 31.2 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	2.0 to 3.0 m bgs, 16.5 to 17.5 m bgs, 31.2 to 32.2 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	1.5 to 3.5 m bgs, 16.0 to 17.5 m bgs, 30.5 to 32.2 m bgs
SAMPLING METHOD	SPT	**SANITARY SEAL/BENTONITE**	0.2 to 1.5 m bgs, 15.5 to 16.0 m bgs, 30.0 to 30.
SURFACE ELEVATION	2.390 m AHD	**STABILISED WATER LEVEL**	2.200 m BTOC
WELL HEAD/TOC	2.33 m AHD	**GROUND WATER ELEVATION**	0.130 m AHD
LOGGED BY	D. Sanderson	**NORTHING**	6251749.96
COMMENTS	Public Domain, IT04 - nested intertidal monitoring well	**EASTING**	333558.53

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				0.2		CONCRETE	Concrete slab	0.20	Cement
0.2		BH410_0.2-0.4		0.4		FILL	Gravelly Sand FILL. Brown, loose, moist. Contains medium grained sand (60%), sub angular roadbase gravels (30%, 5-50 mm), minor clays (10%). No odour, staining or fibre cement material noted. Hand auger refusal on sandstone at 0.75 m bgs.		Bentonite
0.2		BH410_1.2-1.4		1.2		FILL	Gravelly Sand FILL. Grey with orange/brown mottling (40%). Contains medium/course grained sand (50%), weathered sandstone and roadbase gravels (40%, 10-30 mm), minor clays (10%). Recovery 420 mm. No odour, staining or fibre cement material noted.	1.20	
0.3		BH410_2.0-2.2	✳	2.0					Graded Sand Filter Pack
				2.2					IT04S - Shallow Sampling Point
				3.0			SPT refusal at 3.0 m bgs. No recovery.		
0.3		BH410_4.0-4.1		4.0		FILL	Gravel FILL. Black, very loose, saturated. Contains angular gravels (95%, 5-40 mm), trace sands and trace silts. Recovery 100 mm. No odour, staining or fibre cement material noted.	4.00	Bentonite
		BH410_5.0-5.1		5.0			Becoming dark grey, very loose, saturated from 5.0 m bgs. Contains sub rounded gravels (80%, 5-40 mm), minor coarse sands (10%), minor silts (10%). Contains brick rubble (90%). Recovery 100 mm. No odour staining or fibre cement material noted.		
				6.0			SPT refusal at 6.0 m bgs. No recovery.		Graded Sand Filter Pack
		BH410_7.0-7.2	✳	7.0			Becoming dark grey to black, very loose, saturated from 6.0 m bgs. Contains sub angular/angular gravels (80%, 5-40 mm), minor coarse sands (10%), minor silts (10%). Contains brick rubble (60%), sandstone rubble (10%), soil (30%). Recovery 200 mm. No odour, staining or fibre cement material noted.		

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH410 / IT04

PROJECT NUMBER 60153531 **DATE** 10 Feb 12
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.19 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				8.2		FILL *(Continued)*	Gravel FILL. Black, very loose, saturated. Contains angular gravels (95%, 5-40 mm), trace sands and trace silts. Recovery 100 mm. No odour, staining or fibre cement material noted. *(Continued)*		
				8.4			No recovery of SPT sample from 8.0 m bgs. Possible voids or boulder deflection.		Bentonite
				8.6					
				8.8					
				9.0			No recovery of SPT sample from 9.0 m bgs. Possible voids or boulder deflection.		
				9.2					
				9.4					
				9.6					
				9.8					
				10.0			Recovery consists of 2 pieces of brick rubble (20-40 mm) and a small piece of white plastic with copper wire (30 mm) at 10.0 m bgs. No soil in recovery.		PVC casing
				10.2					
				10.4					
				10.6					
				10.8					
				11.0					
		BH410_11.0-11.2		11.2			Becoming brown, very loose, saturated from 11.0 m bgs. Contains sub rounded/sub angular gravels (80%, 5-40 mm), coarse grained sand (20%). Contains brick rubble (90%), soil (10%). Recovery 200 mm. No odour, staining or fibre cement material noted.		
				11.4					
				11.6					
				11.8					
				12.0			Recovery consists of 1 piece of brick rubble (40 mm) at 12.0 m bgs. No soil in recovery.		
				12.2					Graded Sand Filter Pack
				12.4					
				12.6					
				12.8					
0		BH410_13.0-13.2		13.0			Recovery consists of gravels (10-40 mm) from 13.0 m bgs. Contains brick rubble. No odour, staining or fibre cement material noted.		
				13.2					
				13.4					
				13.6					
				13.8					
				14.0			No recovery of SPT sample at 14.0 m bgs. Lithology assumed as above based on trace fragments.		
				14.2					
				14.4					
				14.6					
				14.8					
0.2		BH410_15.0-15.2		15.0			Becoming red/brown, light grey, black, loose, saturated from 15.0 m bgs. Contains pieces of brick and cemented gravels (60%, 10-40 mm), fine to medium grained sand (40%). Recovery 200 mm. No odour, staining or fibre cement material noted.		
				15.2					
				15.4					
				15.6					Bentonite
				15.8					
				16.0			No recovery. SPT bent and broken during hammering. No sampling possible at 16.0 m bgs.		
				16.2					
				16.4					
				16.6					Graded Sand Filter Pack

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH410 / IT04

PROJECT NUMBER 60153531 **DATE** 10 Feb 12
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.19 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				17.0		FILL *(Continued)*		17.00	38 mm Slotted Screen
0.7		BH410_17.0-17.5 QC639 QC640	✳	17.2		CL-CH	SILTY CLAY. Dark grey with red/orange mottling (20%), soft, very moist, medium plasticity. Contains clay (50%), silt (40%), minor sands (10%). Recovery 500 mm. Hydrocarbon odour and minor black staining. No fibre cement material noted.		IT04M - Mid Sampling Point
				17.4					
				17.6					Bentonite
				17.8					
				18.0		CLS		18.00	
0.1		BH410_18.0-18.2		18.2			SANDY CLAY. Orange/brown with grey mottling (40%), very stiff, saturated, low plasticity. Contains clay (60%), medium grained sand (30%), minor silts (10%). Recovery 200 mm. No odour, staining or fibre cement material noted.		
				18.4					
				18.6					
				18.8					
				19.0		CL-CH		19.00	
0.3		BH410_19.0-19.2		19.2			SILTY CLAY. Red with orange mottling (20%), stiff, very moist, medium plasticity. Contains clay (50%), silt (45%), trace fine sands (5%). Recovery 450 mm. No odour, staining or fibre cement material noted.		
				19.4					
				19.6					
				19.8					
				20.0		SC		20.00	
0.4		BH410_20.0-20.2		20.2			CLAY SAND. Grey, loose, very moist. Contains medium grained sand (70%), clay (20%), minor silts (10%). Recovery 400 mm. No odour, staining or fibre cement material noted.		
				20.4					
				20.6					Graded Sand Filter Pack
				20.8					
				21.0		SP		21.00	
0.2		BH410_21.0-21.2		21.2			SAND. Grey, very loose, saturated. Contains fine/medium grained poorly graded sand (90%), trace clay (5%), trace silts (5%). Recovery 400 mm. No odour, staining or fibre cement material noted.		
				21.4					
				21.6					
				21.8					
				22.0		SW		22.00	
0.2		BH410_22.0-22.2		22.2			SAND. Light brown, very loose, saturated. Contains graded fine to medium grained sand (95%), trace clays (5%). Recovery 450 mm. No odour, staining or fibre cement material noted.		
				22.4					
				22.6					
				22.8					
				23.0					
0.5		BH410_23.0-23.2	✳	23.2			Becoming brown with grey mottling (20%), very loose, saturated from 23.0 m bgs. Contains graded fine to medium grained sand (90%), minor clays (10%). Recovery 500 mm. No odour, staining or fibre cement material noted.		
				23.4					
				23.6					
				23.8					Bentonite
				24.0		CL-CH		24.00	
0.3		BH410_24.0-24.2		24.2			SILTY CLAY. Red with orange (30%) and grey (30%) mottling, very stiff, slightly moist, medium plasticity. Contains clay (60%), silt (40%). Recovery 450 mm. No odour, staining or fibre cement material noted.		
				24.4					
				24.6					
				24.8					
				25.0		CH		25.00	
0.2		BH410_25.0-25.2		25.2			SILTY CLAY. Orange with grey mottling (40%), very stiff, slightly moist, high plasticity. Contains clay (70%), silt (30%). Recovery 200 mm. No odour, staining or fibre cement material noted.		
				25.4					

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH410 / IT04

PROJECT NUMBER 60153531 **DATE** 10 Feb 12
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.19 m

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				25.8		CH *(Continued)*			
				26.0				26.00	
0		BH410_26.0-26.2	✳	26.2		SP	SAND. Grey, very loose, saturated. Contains fine/medium grained poorly graded sand (90%), minor clays (10%). Recovery 200 mm. No odour, staining or fibre cement material noted.	26.20	
				26.4		CH	SILTY CLAY. Brown with grey (20%) and orange (10%) mottling, very stiff, moist, high plasticity. Contains clay (60%), silt (30%), minor sands (10%). Recovery 250 mm. No odour, staining or fibre cement material noted.		
				26.6					
				26.8					
				27.0				27.00	Graded Sand Filter Pack
0		BH410_27.0-27.2		27.2		SC-SM	SILTY CLAY SAND. Brown with grey mottling (10%), loose, moist. Contains graded fine to medium grained sand (50%), clay (20%), silt (20%), minor sub rounded gravels (10%, 5-10 mm). Recovery 400 mm. No odour, staining or fibre cement material noted.		
				27.4					
				27.6					
				27.8					
				28.0					
0		BH410_28.0-28.1		28.2			Very small recovery (30 mm) at 28.0 m bgs. Lithology as above with sub rounded gravels (20%, 5-15 mm). Drillers believe core sample slipped out at base.		
				28.4					
				28.6					
				28.8					
				29.0				29.00	
0		BH410_29.0-29.2		29.2		CLS	SANDY CLAY. Grey with red/orange mottling (10%), very stiff, slightly moist, low plasticity. Contains clay (60%), fine grained sand (40%). Recovery 450 mm. No odour, staining or fibre cement material noted.		
				29.4					
				29.6					
				29.8					
				30.0					
		BH410_30.0-30.2		30.2			Becoming red with grey (10%) and orange (10%) mottling from 30.0 m bgs. Recovery 450 mm. No odour, staining or fibre cement material noted.		Bentonite
				30.4					
				30.6					
				30.8					
				31.0					
		BH410_31.0-31.2		31.2			Becoming brown with grey (30%) and orange/red (30%) mottling from 31.0 m bgs. Recovery 450 mm. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				31.4					
				31.6					IT04D - Deep Sampling Point
				31.8					
				32.0				32.00	
		BH410_32.0-32.2	✳	32.2		SP-SC	CLAY SAND. Grey with brown mottling (20%), very dense, slightly moist. Contains fine grained poorly graded sand (80%), clay (20%). Recovery 200 mm. No odour, staining or fibre cement material noted.	32.20	
							SPT refusal after 25 blows at 32.2 m bgs. Assumed soil/bedrock interface encountered. Total Depth: 32.20 m		

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH411 / IT05

PROJECT NUMBER	60153531	**DATE**	12 - 14 Feb 2011
PROJECT NAME	VMP Additional DGI	**BLANK**	0.1 to 2.0 m bgs, 0.1 to 13.5 m bgs, 0.1 to 26.0 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	2.0 to 3.0 m bgs, 13.5 to 14.5 m bgs, 26.0 to 27.0 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	1.5 to 3.5 m bgs, 13.0 to 15.0 m bgs, 25.5 to 27.0 m bgs
SAMPLING METHOD	SPT	**SANITARY SEAL/BENTONITE**	0.2 to 1.5 m bgs, 12.5 to 13.0 m bgs, 25.0 to 25.
SURFACE ELEVATION	2.430 m AHD	**STABILISED WATER LEVEL**	2.130 m BTOC
WELL HEAD/TOC	2.31 m AHD	**GROUND WATER ELEVATION**	0.180 m AHD
LOGGED BY	D. Sanderson	**NORTHING**	6251671.82
COMMENTS	Public Domain, IT05 - nested intertidal monitoring well	**EASTING**	333561.19

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.2	CONCRETE	Concrete Slab	0.20
					FILL	Sandy Gravel FILL. Grey/dark grey, medium dense, moist. Contains sub angular/angular gravels (70%), medium to coarse grained sand (20%), minor silts (10%). Insufficient soil to sample. No odour, staining or fibre cement material noted.	
3.2		BH411_1.0-1.1		1.0	FILL	Hand auger refusal at 0.36 m bgs on granite boulder.	1.00
						Clayey Sand FILL. Grey with orange mottling, very dense, dry. Contains fine to medium grained sand (70%), soft low plasticity clay (20%), minor sandstone gravels (10%, <10 mm). Recovery 240 mm. No odour, staining or fibre cement material noted.	
4.3		BH411_2.0-2.1	✳	2.0	FILL		2.00
				2.2		Silty Sandy Gravel FILL. Brown, very loose, saturated. Contains sub angular/angular roadbase gravels (60%, 10-30 mm), fine to medium grained sand (30%), minor silts (10%). Recovery 200 mm. No odours, staining or fibre cement material noted.	
				3.0		Concrete boulder encountered at 2.5 m bgs.	3.10
4.1		BH411_3.1-3.2	✳	3.2	FILL	Silty Sandy FILL. Grey, loose, saturated. Contains sub angular roadbase gravels (60%), medium grained sand (30%), minor silts (10%). Recovery 200 mm. No odour, staining or fibre cement material noted.	
		BH411_4.0-4.1	✳	4.0	FILL	Sandy Gravel FILL. Grey, loose, saturated. Contains red/white angular gravels (70%, <10 mm), medium to coarse grained sand (30%). Recovery 150 mm. No odour staining or fibre cement material noted.	4.00
0.3		BH411_5.0-5.1		5.0		Becoming dark grey, very loose, saturated from 5.0 m bgs. Contains sub angular/angular roadbase gravels (60%, 10-40 mm), fine to medium grained sand (20%), minor clays (10%), minor silts (10%). Contains brick material. Recovery 100 mm. No odour, staining or fibre cement material noted.	
				6.0		SPT refusal at 6.0 m bgs.	
1.8		BH411_7.0-7.1		7.0		Becoming grey, very loose, saturated from 7.0 m bgs. Contains red/white sub angular gravels (70%), medium to coarse grained sand (20%), minor silts (10%). Contains brick material. Recovery 120 mm. No odour, staining or fibre cement material noted.	
0.3		BH411_8.0-8.1	✳	8.0		Becoming dark grey/black, very loose, saturated from 8.0 m bgs. Contains sub angular/sub rounded gravels (70%, 5-30 mm), medium to coarse grained sand (20%), minor silts (10%). Contains brick material. Recovery 200 mm. No odour, staining or fibre cement material noted.	

WELL DIAGRAM: Cement; Bentonite; Graded Sand Filter Pack; IT05S - Shallow Sampling Point; Bentonite; Graded Sand Filter Pack; Bentonite

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH411 / IT05

PROJECT NUMBER 60153531 **DATE** 12 - 14 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.30 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				9.2		FILL *(Continued)*	Sandy Gravel FILL. Grey, loose, saturated. Contains red/white angular gravels (70%, <10 mm), medium to coarse grained sand (30%). Recovery 150 mm. No odour staining or fibre cement material noted. *(Continued)*		PVC casing
				9.4			SPT refusal at 9.0 m bgs. Recovery of 1 piece of brick/sandstone material (50 mm).		
				9.6					
				9.8					
		BH411_10.0-10.1	✳	10.0			Becoming sub rounded gravels (70%), coarse grained sand (20%), minor silts (10%) from 10.0 m bgs. Contains terracotta rubble, brick material, roadbase gravels. Recovery 150 mm. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				10.2					
				10.4					
				10.6					
				10.8					
				11.0			No recovery of SPT sample at 11.0 m bgs. Possible voids or boulder deflection.		
				11.2					
				11.4					
				11.6					
				11.8					
				12.0		FILL	Gravel FILL. Grey/yellow/red, very loose. Contains angular roadbase gravels (60%, 10-20 mm), sub rounded sandstone gravels (40%, 20-40 mm). Recovery 60 mm, insufficient soil to sample. No odour, staining or fibre cement material noted.	12.00	
				12.2					
				12.4					
				12.6					Bentonite
				12.8					
				13.0			No recovery of SPT sample at 13.0 m bgs. Possible voids or boulder deflection.		
				13.2					
				13.4					Graded Sand Filter Pack
				13.6					
				13.8					
				14.0			No recovery of SPT sample at 14.0 m bgs. Possible voids or boulder deflection.		38 mm Slotted Screen
				14.2					
				14.4					IT05M - Mid Sampling Point
				14.6					
				14.8					
1.8		BH411_15.0-15.1	✳	15.0		FILL	Silty Sandy FILL. Grey, loose to medium dense, saturated. Contains medium to coarse grained red/yellow/white sand (80%), silt (20%). Recovery 300 mm. No odour, staining or fibre cement material noted.	15.00	
				15.2					Bentonite
				15.4					
				15.6					
				15.8					
2.7		BH411_16.0-16.1		16.0		FILL	Sandy Gravel FILL. Dark grey, very loose, saturated. Contains angular sandstone gravels (80%), medium to coarse grained sand (20%). Recovery 100 mm. No odour, staining or fibre cement material noted.	16.00	
				16.2					
				16.4					
				16.6					
				16.8					
				17.0			SPT refusal at 17.0 m bgs. Recovery of 5 angular basalt fragments (20-40 mm).		
				17.2					
				17.4					
				17.6					Graded Sand Filter Pack
				17.8					
0.4		BH411_18.0-18.1 QC631 QC632	✳	18.0		CL-CH	SILTY CLAY. Dark grey, stiff, very moist, medium to high plasticity. Contains clay (60%), silt (40%). Recovery 400 mm. No odour, staining or fibre cement material noted.	18.00	
				18.2					
				18.4					
				18.6					
				18.8					

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH411 / IT05

PROJECT NUMBER 60153531 **DATE** 12 - 14 Feb 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.30 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.8		BH411_19.0-19.1	✳	19.0		CL-CH *(Continued)*	SILTY CLAY. Dark grey, stiff, very moist, medium to high plasticity. Contains clay (60%), silt (40%). Recovery 400 mm. No odour, staining or fibre cement material noted. *(Continued)*		
				19.2			Becoming brown with red/yellow/grey mottling, very stiff, very moist, medium to high plasticity from 19.0 m bgs. Contains (75%) clay, (25%) silts. Recovery 450 mm. No odour, staining or fibre cement material noted.		Bentonite
0.5		BH411_20.0-20.1		20.0		CLS	SANDY CLAY. Grey, Stiff, saturated, low plasticity. Contains clay (70%), fine to medium grained sand (20%), minor silt (10%). Recovery 250 mm. No odour, staining or fibre cement material noted.	20.00	
				20.2					
0.5		BH411_21.0-21.1		21.0			Becoming grey, stiff, very moist, low plasticity from 21.0 m bgs. Contains clay (80%), fine to medium grained sand (20%). Recovery 350 mm. No odour, staining or fibre cement material noted.		
				21.2					
0.6		BH411_22.0-22.1		22.0		SC	CLAYEY SAND. Orange/brown with red/grey mottling (20%), dense, moist. Contains fine to medium grained sand (80%), clay (20%). Recovery 250 mm. No odour, staining or fibre cement material noted.	22.00	
				22.2			SPT refusal at 22.3 m bgs.		Graded Sand Filter Pack
0.9		BH411_23.0-23.1	✳	23.0			Becoming red/orange with grey and brown mottling (30%), medium dense, saturated from 23.0 m bgs. Contains fine to medium grained sand (80%), clay (20%). Recovery 400 mm. No odour, staining or fibre cement material noted.		
				23.2					
0.7		BH411_24.0-24.1 QC634		24.0		CLS	SANDY CLAY. Grey with yellow/red mottling (5%), very stiff, very moist, low plasticity. Contains clay (80%), fine to medium grained sand (20%). Recovery 350 mm. No odour, staining or fibre cement material noted.	24.00	
				24.2					
0.4		BH411_25.0-25.1		25.0		SC	CLAYEY SAND. Grey, very dense, very moist. Contains fine to medium grained sand (80%), clay (20%). Recovery 300 mm. No odour, staining or fibre cement material noted.	25.00	Bentonite
				25.2					
0.9		BH411_26.0-26.1	✳	26.0			Becoming fine to medium grained sand (60%), clay (40%) from 26.0 m bgs. Recovery 250 mm. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				26.2					IT05D - Deep Sampling Point
				27.0			Target depth reached at 27.0 m bgs. Total Depth: 27.00 m	27.00	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH412 / IT06

PROJECT NUMBER	60153531	**DATE**	29 Mar, 6 - 8 Apr 2011
PROJECT NAME	VMP Additional DGI	**BLANK**	0.1 to 2.5 m bgs, 0.1 to 10.0 m bgs, 0.1 to 22.5 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	2.5 to 3.5 m bgs, 10.0 to 11.0 m bgs, 22.5 to 23.5 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	2.0 to 4.0 m bgs, 9.5 to 12.0 m bgs, 22.0 to 23.5 m bgs
SAMPLING METHOD	Grab / SPT	**SANITARY SEAL/BENTONITE**	0.4 to 2.0 m bgs, 9.0 to 9.5 m bgs, 21.5 to 22.0 m
SURFACE ELEVATION	2.380 m AHD	**STABILISED WATER LEVEL**	1.880 m BTOC
WELL HEAD/TOC	2.27 m AHD	**GROUND WATER ELEVATION**	0.390 m AHD
LOGGED BY	K. O'Brien / L. Kontus	**NORTHING**	6251476.89
COMMENTS	Public Domain, IT06 - nested intertidal monitoring well	**EASTING**	333595.17

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				0.1		CONCRETE	Concrete Slab	0.10	Cement
0		BH412_0.5-0.6		0.2 – 0.8		FILL	Silty Sandy Gravel FILL. Dark brown, medium dense, moist. Contains fine to coarse sand with a minor clay pockets. No odour, staining or fibre cement material noted. Sandstone boulder encountered at 0.65 m bgs.		
		BH412_1.1-1.3		1.0 – 1.8		FILL	Sandy Clay FILL. Brown/white, medium stiff, very moist, low plasticity. Contains sandstone and weathered sandstone. Recovery 300 mm. No odour, staining or fibre cement material noted.	1.00	Bentonite
0.3		BH412_2.0-2.2		2.0 – 2.8		FILL	Sandstone FILL. Pale grey, dry. Contains crushed sandstone. Recovery 250 mm. No odour staining or fibre cement material noted.	2.00	Graded Sand Filter Pack
0		BH412_3.0-3.1	✳	3.0 – 3.8		FILL	Silty Sandy FILL. Dark grey, medium dense, saturated. Contains (90%) crushed red brick. Recovery 100 mm. Hydrocarbon odour. No staining or fibre cement material noted.	3.00	IT06S - Shallow Sampling Point
		BH412_4.0-4.1	✳	4.0 – 5.8		FILL	Sandstone FILL. Brown/pale and dark grey, very dense, moist. Contains weathered sandstone with minor clays. Recovery 100 mm. Hydrocarbon odour. No staining or fibre cement material noted. No recovery of SPT sample at 5.0 m bgs. Sediment too soft, unconsolidated and saturated.	4.00	Bentonite
0.5		BH412_6.0-6.1		6.0 – 6.8		FILL	Silty Clay FILL. Grey, soft, moist, medium plasticity. Contains brick and sandstone rubble (70%, 30 mm), soil (30%). Recovery 100 mm. Hydrocarbon odour. No staining or fibre cement material noted.	6.00	PVC casing
0		BH412_7.0-7.2		7.0 – 7.8		FILL	Silty Clay Gravel FILL. Dark grey, dense, moist. Contains crushed brick, sandstone, siltstone and roadbase gravels, minor sands. Recovery 250 mm. No odour staining or fibre cement material noted.	7.00	Graded Sand Filter Pack
								8.00	

60153531_DGI_1JUNE2011.GPJ 6/3/12

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH412 / IT06

PROJECT NUMBER 60153531 **DATE** 29 Mar, 6 - 8 Apr 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.50 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.2		BH412_8.0-8.1	✳	8.0		FILL	Silty Clay FILL. Grey/red/white, soft, moist, low plasticity. Contains red brick (40%), weathered sandstone (30%), soil (30%). Recovery 150 mm. No odour, staining or fibre cement material noted.		
				8.2					
				8.4					
				8.6					
				8.8					
				9.0			SPT refusal at 9.0 m bgs.		
				9.2					Bentonite
				9.4					
				9.6					
				9.8					Graded Sand Filter Pack
				10.0				10.00	
0		BH412_10.0-10.1		10.0		FILL	Sandstone FILL. Red and pale grey, medium dense, moist. Contains (50%) weathered sandstone and (50%) crush red brick. Recovery 100 mm. No odour, staining or fibre cement material noted.		
				10.2					
				10.4					38 mm Slotted Screen
				10.6					
				10.8					IT06M - Mid Sampling Point
				11.0					
0.3		BH412_11.0-11.2	✳	11.0			Becoming white/pale grey/red, medium dense, moist. Contains weathered sandstone (80%) and red crushed brick (20%). Recovery 200 mm. No odour, staining or fibre cement material noted.		
				11.2					
				11.4					
				11.6					
				11.8					
				12.0			No recovery of SPT sample at 12.0 m bgs. Unconsolidated fill material only.		
				12.2					
				12.4					
				12.6					Bentonite
				12.8					
				13.0				13.00	
				13.0		FILL	Gravel FILL. Brown/red, moist. Contains brick material (90%), sandstone (5%), grey silty sand (5%). Too high proportion of rubble in recovery (200 mm) to sample. No odour, staining or fibre cement material noted.		
				13.2					
				13.4					
				13.6					
				13.8					
				14.0				14.00	
		BH412_14.0-14.1		14.0		FILL	Silty Clay FILL. Brown, soft, moist, medium plasticity. Contains minor sands. Recovery 100 mm. No odour, staining or fibre cement material noted.		
				14.2					
				14.4					
				14.6					
				14.8					
				15.0			Becoming dark grey/brown, soft, moist, medium plasticity. Contains siltstone gravels and minor sandstone gravels. Recovery less than 50 mm, not enough to sample. No odour, staining or fibre cement material noted.		
				15.2					
				15.4					
				15.6					
				15.8					Graded Sand Filter Pack
				16.0					
				16.2			SPT refusal at 16.2 m bgs.		
				16.4					
				16.6			Drilling refusal at 16.5 m bgs. Core drilling recovery of 500 mm of solid grey basalt. No		

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH412 / IT06

PROJECT NUMBER 60153531 **DATE** 29 Mar, 6 - 8 Apr 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** 0.50 m

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PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				17.0		FILL *(Continued)*	odour, staining or fibre cement material noted. Silty Clay FILL. Brown, soft, moist, medium plasticity. Contains minor sands. Recovery 100 mm. No odour, staining or fibre cement material noted. *(Continued)* SPT refusal at 17.0 m bgs. Small recovery of 100 mm of grey basalt. No odour, staining or fibre cement material noted. Drilling refusal at 17.1 m bgs. Core drilling recovery of 400 mm of solid grey basalt. No odour, staining or fibre cement material noted.	18.00	
0.4		BH412_18.0-18.1		18.0		CL-ML	SILTY CLAY. Grey, medium dense, moist, medium plasticity. Recovery less than 100 mm, not enough to sample. No odour, staining or fibre cement material noted.		Bentonite
1.3		BH412_19.0-19.3 QC627 QC628	✳	19.0		CL-CH	SILTY CLAY. Dark grey, very soft, very moist, medium to high plasticity. Recovery 500 mm. No odour, staining or fibre cement material noted. Clay Sand lens encountered within Silty Clay at 19.3 m bgs.	19.00	
0		BH412_20.0-20.2		20.0		SW-SC	SILTY SANDY CLAY. Brown/pale grey, soft, saturated, medium to high plasticity. Recovery 560 mm. No odour, staining or fibre cement material noted. Becoming brown/pale grey Sand with minor clays. No odour, staining or fibre cement material noted.	20.00	Graded Sand Filter Pack
0		BH412_21.0-21.2		21.0		SP	SAND. Pale grey, saturated. Contains sand (100%) with minor black staining. Trace glass inclusions (5 mm). Recovery 250 mm. No odour or fibre cement material noted.	21.00	
									Bentonite
0		BH412_22.0-22.2	✳	22.0		SC	CLAY SAND. Pale grey/cream, saturated. Contains fine to medium grained sand. with Recovery 350 mm. No odour. Minor organic staining. No fibre cement material noted.	22.00	
							SPT refusal at 23.0 m bgs. Recovery less than 30 mm of grey Clay Sand. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				23.0					IT06D - Deep Sampling Point
				23.5			SPT refusal on bedrock at 23.5 m bgs. Total Depth: 23.50 m	23.50	

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH413 / IT07

PROJECT NUMBER	60153531	**DATE**	29 Mar, 1 and 4 Apr 2011
PROJECT NAME	VMP Additional DGI	**BLANK**	0.1 to 2.0 m bgs, 0.1 to 9.0 m bgs, 0.1 to 16.7 m bgs
LOCATION	Hickson Road, Millers Point NSW 2000	**SCREEN**	2.0 to 3.0 m bgs, 9.0 to 10.0 m bgs, 16.7 to 17.7 m bgs
DRILLING METHOD	Mud Rotary	**GRAVEL PACK**	1.4 to 3.2 m bgs, 7.3 to 9.6 m bgs, 16.3 to 17.7 m bgs
SAMPLING METHOD	Grab / SPT	**SANITARY SEAL/BENTONITE**	0.4 to 1.4 m bgs, 6.7 to 7.3 m bgs, 15.9 to 16.3 m
SURFACE ELEVATION	2.400 m AHD	**STABILISED WATER LEVEL**	2.420 m BTOC
WELL HEAD/TOC	2.32 m AHD	**GROUND WATER ELEVATION**	-0.100 m AHD
LOGGED BY	K. O'Brien / L. Kontus	**NORTHING**	6251358.96
COMMENTS	Public Domain, IT07 - nested intertidal monitoring well	**EASTING**	333607.32

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
				0.2	CONCRETE	Concrete Slab	0.08
				0.4	FILL	Silty Sandy Gravel FILL. Brown, medium dense, moist. Contains sub angular roadbase gravels with sandstone gravels. No odour, staining or fibre cement material noted.	
0		BH413_0.5-0.6		0.6			
				0.8			
				1.0			1.10
0		BH413_1.1-1.3	✳	1.2	FILL	Gravelly Silty Clay FILL. Brown, medium stiff, moist, medium plasticity. Contains sandstone gravels (30 mm) and small black rock (like charcoal). Recovery 300 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				1.4			
				1.6			
				1.8			
				2.0 ▽			2.00
0		BH413_2.0-2.3		2.2	FILL	Silty Sandy Gravel FILL. Brown, very loose, saturated. Contains minor clays and sandstone gravels (30 mm). Recovery 300 mm. No odour, staining or fibre cement material noted.	
				2.4 ▼			
				2.6			
				2.8			
				3.0		Becoming loose, saturated from 3.0 m bgs. Contains brick, roadbase, sandstone and concrete gravels (80%, 5 - 25 mm), soil (20%). Recovery 150 mm. Not enough soil to sample. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				3.2			
				3.4			
				3.6			
				3.8			
				4.0			4.00
0		BH413_4.0-4.2	✳	4.2	FILL	Gravel FILL. Dark grey/yellow, very dense, moist sandstone gravels. Recovery 200 mm. Hydrocarbon odour. No staining or fibre cement material noted.	
				4.4			
				4.6			
				4.8			
				5.0			
0		BH413_5.0-5.15		5.2		Becoming yellow, very dense, moist weathered sandstone. Contains roadbase gravels. Recovery 150 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				5.4			
				5.6			
				5.8			
				6.0			
0		BH413_6.0-6.15	✳	6.2		Becoming red/white, very dense, moist. Contains weathered and unweathered sandstone with siltstone gravels. Recovery 150 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				6.4			
				6.6			
				6.8			
				7.0			7.00
				7.2	FILL	Gravel FILL. Contains dark grey, large siltstone gravels (40 mm) with minor sandstone gravels. Some recovery of dark grey silty sand occurred around gravels. Too high proportion of gravels to sample. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				7.4			
				7.6			
				7.8		Solid sandstone boulder (80 x 200 mm) recovered at 7.8 m bgs.	
				8.0			8.00
0		BH413_8.0-8.1		8.2	FILL	Silty Sand FILL. Dark grey/red, medium dense, moist. Contains weathered sandstone and sandstone gravels (20 mm). Recovery 200 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	
				8.4			
				8.6			
				8.8			
							9.00

WELL DIAGRAM: Cement; Bentonite; Graded Sand Filter Pack; IT07S - Shallow Sampling Point; Bentonite; Graded Sand Filter Pack; PVC casing; Bentonite; Graded Sand Filter Pack; 38 mm Slotted Screen; IT07M - Mid Sampling Point

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW 2000

BOREHOLE LOG BH413 / IT07

PROJECT NUMBER 60153531 **DATE** 29 Mar, 1 and 4 Apr 2011
PROJECT NAME VMP Additional DGI
LOCATION Hickson Road, Millers Point NSW 2000 **GROUND WATER ELEVATION** -0.02 m

- Continued from Previous Page -

PID (ppm)	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGS)	GRAPHIC LOG	USCS CLASS	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		BH413_9.0-9.2	✳	9.2		FILL	Gravel FILL. Red brick, white/yellow sandstone, very dense, moist. Contains brick gravels (70%), sandstone gravels (30%). Recovery 200 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.		Bentonite
				9.4					
				9.6					
				9.8					
				10.0				10.00	
0		BH413_10.0-10.2		10.2		FILL	Gravel FILL. Red/grey, very dense, moist. Contains sandstone gravels with minor quartz and granite gravels. Recovery 200 mm. No odour, staining or fibre cement material noted.		Graded Sand Filter Pack
				10.4					
				10.6					
				10.8					
				11.0			SPT shoe and spoons warped and broken. No recovery of SPT sample at 11.0 m bgs.		
				11.2					
				11.4					
				11.6					Bentonite
				11.8					
				12.0			No recovery of SPT sample at 12.0 m bgs.		
				12.2					
				12.4					
				12.6					
				12.8					
				13.0			No recovery of SPT sample at 13.0 m bgs on first attempt. Second attempt, no soil recovery only unconsolidated black/red slag fragments (10 mm) with vitreous appearance.		
				13.2					
				13.4					
				13.6					
				13.8					Graded Sand Filter Pack
				14.0			As above		
				14.2					
				14.4					
				14.6					
				14.8					
				15.0		CH	SILTY CLAY. Dark grey, very soft, saturated, high plasticity. Contains bark and root organic matter. Recovery 600 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	15.00	
1.1		BH413_15.0-15.5 QC622 QC623	✳	15.2			Becoming fine grained silty sandy clay from 15.3 m bgs. Slight hydrocarbon odour. No staining or fibre cement material noted.		
				15.4					
				15.6					
				15.8					
				16.0		CL-CH	SILTY SANDY CLAY. Dark grey, very soft, saturated, high plasticity. Recovery 600 mm. Slight hydrocarbon odour. No staining or fibre cement material noted.	16.00	Bentonite
0.4		BH413_16.0-16.2		16.2					
				16.4		SANDSTONE		16.40	
0.4		BH413_16.4-16.6	✳	16.6			Weathered SANDSTONE. White/dark yellow, very stiff, moist. Contains weathered sandstone. Slight hydrocarbon odour. No staining or fibre cement material noted.		Graded Sand Filter Pack
				16.8					
				17.0					IT07D - Deep Sampling Point
				17.2					
				17.4					
				17.6				17.70	
							Drilling refusal on bedrock at 17.7 m bgs. Total Depth: 17.70 m		

Appendix E

Calibration

Lauren's PID-

28/01/2011

PID Calibration Certificate

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument PhoCheck Tiger
Serial No. T-105511

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 ev			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

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

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		103ppm Isobutylene	NATA	828SY		103 ppm

Calibrated by: Anne Rutlidge

Calibration date: 28/01/2011

Next calibration due: 27/02/2011

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105429

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6 eV			
Alarms	Beeper	✓	Low	High	TWA	STEL
	Settings	✓	50ppm	100ppm		
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

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

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		103ppm Isobutylene	NATA	828SY		103ppm

Calibrated by: **Anne Rutlidge**

Calibration date: **24/01/2011**

Next calibration due: **23/02/2011**

Testwell Interface Meter

Instrument Testwell (50M)
Serial No. 9300-163

airmet
Air-Met Scientific Pty Ltd
1300 137 067

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

Certificate of Calibration

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

Calibrated by: Carly Hanrahan

Calibration date: 28/01/2011

Next calibration due: 29/03/2011

AFCOM

model : YSI Quatro Pro Plus

Water Quality Meter – Calibration Fo

Serial Number: 10E101052

Frequency : Daily on use

Model No.	Date/Time	pH 4	pH 7	Conductivity (µS/cm)	Redox (mV)	Signature
10E101052	25/2/11 13:15	3.99	7.00	2763	230.2@26°c	DS
" "	28/2/11 06:50	4.00	6.96	2708@23.7°c	233.7@23.5°c	DS

AECOM

CPFO471q (ENV) Contaminated Land - PID Calibration Form

Project Name	BARANGAROO VMP DG1
Project Number	60153531 / 6.1
Frequency	☑ Daily on User ☐ Twice Daily

PID Serial No.	Date/Time	Hired Equipment Y/N (if yes, attach calibration sheet)	Fresh Air Cal. OK Y/N	Gas	Calibrate OK Y/N	Filter Change Required Y/N	Pump Clean Required Y/N	Charging Required Y/N	Comments	Name (print)	Signature
T-105429	8.2.11 a.30am	Y	Y	Isobutylene 100ppm	Y 101.7ppm	N	N	Y		KATE OBRIEN	
"	9.2.11 7.45	Y	Y	"	Y 103.4ppm	N	N	Y		"	
"	10.2.11 9.00	Y	Y	"	103.0ppm	Y	~~Y~~ N	Y	Filter changed and nozzle cleaned	"	
"	11.2.11 8:50	Y	Y		101.9ppm	N	N	Y		"	
"	14.2.11	Y	Y	"	102.8ppm	N	N	N		"	

AECOM

CPFO472a (ENV) Photoionization Detector (Hire Unit)

Job Number/Name: 60153531-6.1 / Barangaroo VMP DAI

Frequency: Daily on Use or Twice Daily

PID Serial Number	Date/Time	Fresh Air Cal.	Span Gas concentration (e.g.101 ppm Isobutylene)	Span Gas Cal.	Name (print)	Signature
T-105511	8/2/2011 - 7:30	0.0 ppm	Isobutene 100ppm	100.3 ppm	Lauren Kontus	
T-105511	9/2/2011 - 7:50	0.0 ppm	Isobutene 100ppm	102.4ppm	Lauren Kontus	
T-105511	10/2/2011 - 8:00	0.0 ppm	Isobutene 100ppm.	99.3 ppm	Lauren Kontus	
T-105511	11/2/2011 - 7:40	0.0 ppm	Isobutene 100ppm	100.3 ppm	Lauren Kontus	
T-105511	14/2/2011 - 7:40	0.0 ppm	Isobutene 100ppm	98.9 ppm	Lauren Kontus	
T-105511	15/2/2011 - 7:20	0.0 ppm	Isobutene 100ppm	99.8 ppm	Lauren Kontus	

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 10E101052

airmet
Air-Met Scientific Pty Ltd
1300 137 067

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

Certificate of Calibration

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

Diffusion mode Aspirated mode

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		IE1340	pH 7.00
2. pH 4.00		pH 4.00		IE1288	pH 4.00
3. mV		235 mV		HK1412/3	235 mV
4. EC		2.76 mS		IG1988	2.77 Ms
5. D.O		0ppm		753	0ppm
6. Temp		22.4°C		MultiTherm	22.0°C

Calibrated by: AR **Anne Rutlidge**

Calibration date: **21/02/2011**

Next calibration due: **23/03/2011**

Oil / Water Interface Meter

Instrument Solinst Interface Meter (30M)
Serial No. 122 009772-1

Air-Met Scientific Pty Ltd
1300 137 067

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

Certificate of Calibration

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

Calibrated by: **Amy Jones**

Calibration date: **24/02/2011**

Next calibration due: **25/04/2011**

Appendix F

Data Validation

D R A F T

1.0 Introduction

The following sections describe the components of the Quality Assurance and Control Plan that assess the achievement of the DQOs set out in **Appendix A**, by consideration of the data quality indicators – DQIs (precision, accuracy, representativeness, completeness and comparability).

1.1 Data Quality Indicators

The project DQIs have been established to set acceptance limits on field and laboratory data collected as part of this investigation. For both field and laboratory procedures acceptance limits are set at different levels for different projects and by the laboratories.

Non-compliances with acceptance limits are to be documented and discussed in the report. The DQIs are as follows:

Table 1 Data Quality Indicators

DQI	Field	Laboratory	Acceptability Limits
Completeness	All critical locations sampled All samples collected (from grid and depth) Standard Operating Procedures (SOPs) appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to Sampling and Analysis Plan (SAQP) Appropriate methods Appropriate Limits of Reporting (LORs) Sample documentation complete Sample holding times complied with	As per NEPC (1999) < nominated criteria As per NEPC (1999)
Comparability	Sample SOPs used on each occasion Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used Sample LORs (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (1999) < nominated criteria
Representativeness	Appropriate media sampled according to SAQP	All samples analysed to meet SAQP	
Precision	SOPs appropriate and complied with Collection of blind and split duplicate samples	Analysis of: Field intra-laboratory duplicate samples (1 in 10 samples) Field inter-laboratory duplicate samples (1 in 20 samples) Laboratory duplicate samples	RPD <50%

DQI	Field	Laboratory	Acceptability Limits
Accuracy	SOPs appropriate and complied with Collection of rinsate blanks	Analysis of: Field/trip blanks (1/day) Rinsate blanks (1/day/equipment) Inter-laboratory duplicate samples (1 in 20 samples) Method blanks Matrix spikes Matrix spike duplicates Surrogate spikes Laboratory control samples Laboratory prepared spikes Reagent blanks Reference materials	 Non-detect for CoPC Non-detect for CoPC RPD <50% Non-detect for CoPC %R 70 to 130%* RPD of <30% %R 70 to 130%* %R 70 to 130 %* %R 70 to 130%* Non-detect for CoPC Varies

*If laboratory matrix spike, surrogate or laboratory control sample recoveries were outside the set acceptable limit of 70 to 130%, the results were compared to the Laboratory Analyte Specific Acceptance Criteria (ASAC).

All reporting must comply with NSW EPA (2000) *Guidelines for Consultants Reporting on Contaminated Sites*.

2.0 Field QA/QC

2.1 Sampling Team

Soil samples were collected between 8 February and 12 May 2011 by Lauren Kontus, Kate O'Brien and Dirk Sanderson, suitably qualified and experienced AECOM Environmental Engineers/Scientists Groundwater samples were collected between 24 February and 19 May 2011 by Lauren Kontus, Dirk Sanderson and Kate O'Brien.

2.2 Sample Collection

Soil and groundwater were collected in accordance with **Section 7.0** in the body of the report.

2.3 Sample Handling and Preservation

A new pair of disposable nitrile sampling gloves was donned between collection of each soil and groundwater sample. Soil samples were immediately placed into laboratory prepared and supplied acid washed and solvent jars with screw top Teflon-lined lids. Sample jars were filled so that no headspace remained (where practical).

Soil and groundwater samples were placed either in a chilled, insulated container with ice or in a sample refrigerator between sampling and analysis. Soil and groundwater samples were preserved for the various contaminants of concern in accordance with the requirements of NEPC (1999) as detailed in the table below:

Table 2 Sample Preservation

Matrix	Analyte	Container	Preservation
Soil	All analytes	250 mL Glass screw top jar	Unpreserved, 4ºC
	Asbestos	Zip lock plastic bag	Nil
Water	Metals (Ultra Trace)	125 ml Clear Plastic Bottle	Field Filtered , Ultra Pure Nitric Acid, 4ºC
	TPH(C_{10}-C_{36}), PAH	500 ml Amber Bottle	Unpreserved, 4ºC
	TPH(C_6-C_9), BTEX	2 x 40 ml Amber Vials	Hydrochloric Acid, 4ºC
	Free & WAD Cyanide	250 ml White Plastic Bottle	$Cd(NO_3)_2$, NaOH, 4ºC

Sample numbers, depths, preservation and analytical requirements were recorded on the chain-of-custody documentation (signed copies provided with the laboratory reports in **Appendix I**), which accompanied the samples to the laboratory.

Samples were placed in eskies with crushed ice immediately after collection and the laboratory reported that all batches were received with ice; AECOM therefore considers that the samples were appropriately stored and preserved.

2.4 Calibration

During the field investigation calibration of the photoionisation detector (PID) was undertaken in accordance with manufacturer's instructions. The PID was calibrated prior to delivery by the supplier, and at least once daily (at the start of each sampling day) with 100 parts per million (ppm) of isobutylene.

The water quality meters (TPS 90 FLMV and YSI Quatro Pro Plus) were calibrated to delivery by the supplier and at least once daily (at the start of each sampling day) in the field with the required calibration solutions.

All calibration results were satisfactory. Details of calibration are provided in **Appendix D**.

2.5 Field Intra and Inter-laboratory Duplicate Samples

The purpose of duplicate samples are to estimate the variability of a given characteristic or contaminant associated with a population. For this assessment, intra-laboratory duplicate soil samples were collected in the field at a rate of at least one in ten primary samples. Inter-laboratory duplicate soil samples were collected at a rate of at least one in twenty primary samples.

The field duplicate soil samples were obtained from similar soils of an identical depth and immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into two sample jars. Samples were not homogenised due to potential loss of volatiles.

Duplicate samples were labelled so as to conceal their relationship to the primary sample from the laboratory and the key to the duplicate samples was recorded in the field note book.

It is common that significant variation in duplicate results is often observed (particularly for solid matrix samples) due to sample heterogeneity or low reported concentrations near the LOR. The overall precision of field intra-laboratory duplicates, inter-laboratory duplicate samples and laboratory duplicates is generally assessed by their Relative Percent Difference (RPD), given by:

$$RPD = \frac{|D1-D2|}{(D1+D2)/2} \times 100$$

Where D1 is the primary sample measurement

D2 is the duplicate sample measurement

RPDs for soil duplicate samples were compared to criteria presented in the DQI table above. The field duplicate and corresponding primary sample results and calculated RPDs are presented in **Table T1** at the end of this appendix.

The following table provides summary of the field duplicate samples analytes and the RPD results which were above the DQIs.

Table 3 Soil Duplicate Results Summary

QA/QC Sample ID	Primary Sample			Duplicate Type	Analytes	RPD Exceedences
	Loc	Depth	Soil Type			
QC656	BH403	8.0-8.4	SILTY SAND	Intra-laboratory	TPH, BTEX, Metals, PAHs	Total Xylene (106.8%), Ethylbenzene (56.7%), Toluene (139.0%), Xylene (m & p) (110.6%), Xylene (o) (100.0%), PAH (Sum of Total) (96.4%), Acenaphthene (140.0%), Acenaphthylene (81.9%), Anthracene (132.8%), Benz(a)anthracene (82.1%), Benzo(a)pyrene (62.8%), Benzo(b)fluoranthene (68.2%), Benzo(k)fluoranthene (62.6%), Chrysene (77.4%), Dibenz(a,h)anthracene (56.1%) ,, Fluoranthene (80.3%), Fluorene (166.4%), Indeno(1,2,3-c,d)pyrene (50.3%), Naphthalene (178.5%), Phenanthrene (137.0%), TPH C10-C14 (121.0%), TPH C6-C9 (69.6%)
QC613	BH408	9.0-9.4	SILTY CLAYEY SAND with layer of tar	Intra-laboratory	TPH, BTEX, Metals, PAHs	Total Xylene (120.7%), Benzene (123.1%), Ethylbenzene (56.7%), Xylene (m & p) (123.8%), Xylene (o) (116.7%), PAH (Sum of Total) (112.9%), Acenaphthene (117.0%), Acenaphthylene (110.5%), Anthracene (104.9%), Benz(a)anthracene (118.0%), Benzo(a)pyrene (120.0%), Benzo(b)fluoranthene (122.8%), Benzo(k)fluoranthene (125.0%), Chrysene (120.0%), Fluoranthene (110.2%), Fluorene (110.3%), Naphthalene (116.2%), Phenanthrene (107.3%), TPH C15-C36 (82.0%), TPH C10-C14 (106.4%), TPH C15-C28 (92.8%), TPH C10-C36 (Sum of Total) (88.8%)
QC653	BH404	14.0-14.4	FILL	Intra-laboratory	TPH, BTEX, Metals, PAHs	Lead (82.6%), Cadmium (66.7%), Chromium (58.5%), Copper (53.3%), Mercury (63.2%), Benzo(k)fluoranthene (66.7%), Fluorene (50.6%)
QC609	BH405	14.0-14.4	SILTY SANDY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	Total Xylene (173.7%), Benzene (163.1%) Toluene (169.7%), Xylene (m & p) (173.9%), Xylene (o) (173.1%), Chromium (76.9%), TPH C6-C9 (175.9%)
QC610	BH407	14.0-14.5	SILTY CLAYEY SAND	Intra-laboratory	TPH, BTEX, Metals, PAHs	No exceedences
QC611	BH407	14.0-14.5	SILTY CLAYEY SAND	Inter-laboratory	TPH, BTEX, Metals, PAHs	No exceedences
QC602	BH406	15.0-15.4	SILTY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	Total Xylene (71.3%), Benzene (81.3%), Ethylbenzene (72.0%), Toluene (75.5%), Xylene (m & p) (70.0%), Xylene (o) (74.9%), PAH (Sum of Total) (51.1%), Acenaphthylene (65.2%), Benzo(k)fluoranthene (90.5%), Chrysene (52.0%), Fluorene (62.7%), Naphthalene (51.8%), Phenanthrene (52.3%), TPH C6-C9 (90.6%)

QA/QC Sample ID	Primary Sample			Duplicate Type	Analytes	RPD Exceedences
	Loc	Depth	Soil Type			
QC603	BH406	15.0-15.4	SILTY CLAY	Inter-laboratory	TPH, BTEX, Metals, PAHs	Indeno(1,2,3-c,d)pyrene (50%), TPH C6-C9 (89%)
QC622	BH413	15.0-15.5	SILTY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	No exceedences
QC623	BH413	15.0-15.5	SILTY CLAY	Inter-laboratory	TPH, BTEX, Metals, PAHs	Lead (64.4%), Arsenic (78.3%), Chromium (98%), Copper (67.9%), Mercury (87.8%), Nickel (64.5%), Zinc (69.6%), Benz(a)anthracene (144.2%), Benzo(a)pyrene (144.1%), Benzo(g,h,i)perylene (120%), Chrysene (146.3%), Fluoranthene (131.4%), Indeno(1,2,3-c,d)pyrene (133.3%), Phenanthrene (126.3%), Pyrene (132.6%)
QC606	BH402	17.0-17.4	CLAYEY SILTY SAND	Intra-laboratory	TPH, BTEX, Metals, PAHs	Total Xylene (72.5%), Benzene (65.8%), Ethylbenzene (74.8%), Toluene (74.7%), Xylene (m & p) (72.3%), Xylene (o) (72.8%), PAH (Sum of Total) (64.6%), Acenaphthene (63.8%), Acenaphthylene (62.7%), Anthracene (66.9%), Benz(a)anthracene (53.5%), Benzo(a)pyrene (62.1%), Benzo(b)fluoranthene (61.1%), Benzo(g,h,i)perylene (63.2%), Chrysene (58.5%), Fluoranthene (62.9%), Fluorene (61.8%), Indeno(1,2,3-c,d)pyrene (63.8%), Naphthalene (70.7%), Phenanthrene (61.9%), Pyrene (62.8%),TPH C6-C9 (72.1%)
QC607	BH402	17.0-17.4	CLAYEY SILTY SAND	Inter-laboratory	TPH, BTEX, Metals, PAHs	Zinc (52.6%), Acenapthene (72.2%), Acenaphthylene (66.7%), Anthracene (61.2%), Dibenz(a,h)anthracene (102.0%), Fluoranthene (53.9%), Pyrene (56.8%)
QC639	BH410	17.0-17.5	SILTY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	Cyanide Total (66.7%), Dibenzofuran (159.2%)
QC632	BH411	18.0-18.1	SILTY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	Arsenic (59.5%), Mercury (72.0%)
QC627	BH412	19.0-19.3	SILTY CLAY	Intra-laboratory	TPH, BTEX, Metals, PAHs	No exceedences
QC628	BH412	19.0-19.3	SILTY CLAY	Inter-laboratory	TPH, BTEX, Metals, PAHs	Lead (86.8%), Nickel (58.1%)

The majority of the above soil RPD exceedences indicate variability of metal, PAH and TPH concentrations in fill material and can be attributed to either the sample heterogeneity of the fill material or to low detected concentrations (<10x LOR). In some instances (QC656/BH403, QC613/BH408, QC653/BH404, QC609/BH405, QC602/BH402 and QC606/QC607/BH402) high RPDs were calculated for one or more of the TPH, PAH or BTEX results where there were elevated concentration of these analytes. Given the elevated concentrations of the analytes in the samples, the high RPDs for these samples are not considered affect the overall the assessment of this data.

The actual soil intra-laboratory duplicate sample frequency for this investigation was 13% (i.e. at least 1 duplicate sample per 10 primary samples). The actual soil inter-laboratory duplicate sample frequency for this investigation was 7% (i.e.at least 1 duplicate sample per 20 primary samples).

RPDs for groundwater duplicate samples have been compared to criteria presented in the DQI table above and exceedences are summarised below in Table 4 and presented in Table T2 at the end of this appendix.

Table 4 Groundwater Duplicate Results Summary

QA/QC Sample ID	Primary Sample	Duplicate Type	Analytes	RPD Exceedences
QC644	IT04M	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Nickel (filtered) (57.1%) Sum of 5 PAHs (58.8%) Anthracene (66.7%) Fluoranthene (50%) Fluorene (100%) Phenanthrene (57.1%)
QC645	IT04M	Inter-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Arsenic (filtered) (169.2%) Cobalt (filtered) (96.3%) Nickel (filtered) (188.9%) Vanadium (filtered) (170.4%) PAH (Total) (182.1%) Fluoranthene (187.4%) Fluorene (133.3%) Phenanthrene (156.5%)
QC643	IT05D	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Acenaphthylene (66.7%)
QC618	MW198	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	No exceedences
QC618 FILTRATE	MW198 FILTRATE	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Phenol (50%)
QC615	MW401	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Cadmium (filtered) (104.8%)
QC616	MW401	Inter-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	Cadmium (filtered) (78.3%) Zinc (filtered) (56%) Sum of 10 PAHs (121.7%) 2,4-dimethylphenol (50%) Pyrene (53.7%)
QC615 FILTRATE	MW401 FILTRATE	Intra-laboratory	TPH, BTEX, Metals, Phenols, PAHs, SVOCs, Pesticides, Inorganics	No exceedences

With the exception of RPDs for the primary sample and inter-laboratory triplicate QC645, the RPD exceedences were generally in sample pairs with low reported concentrations. The RPDs for the primary and intra-laboratory duplicate laboratory paid associated with QC645 were acceptable and therefore it is considered that the RPDs for the primary sample and QC645 reflect an error in either the secondary laboratory's analysis or a different sample was analysed. The remaining inter-laboratory triplicate RPDs were considered acceptable. It is also noted that volatile compounds were within the acceptable RPDs.

The actual groundwater intra-laboratory duplicate sample frequency for this investigation was 16% (i.e. at least 1 duplicate sample per 10 primary samples). The actual groundwater inter-laboratory duplicate sample frequency for this investigation was 8% (i.e.at least 1 duplicate sample per 20 primary samples).

2.6 Decontamination Procedure

Sampling equipment (including SPT split spoon, interface meter and Micropurge submersible pump) was cleaned in phosphate free detergent ("Decon" 90) solution, rinsed in potable water and then finally rinsed in laboratory supplied water prior to use and between each sampling location.

A total of 19 rinsate blank samples were collected using laboratory supplied rinse water, which was run over the decontaminated sampling equipment at the end of each day's fieldwork. The samples were used to evaluate whether contaminants were likely to have been introduced by contact of the sample medium with sampling equipment.

The rinsate results are presented in **Table 2** in **Appendix F**.

The table below presents a summary of the results of the blank samples collected and analysed:

Table 5 Summary of Rinsate Sample Results

Rinsate Sample ID	Date	Equipment	Results
QC655	08/02/2011	SPT Split Spoon	<LOR
QC662	09/02/2011	SPT Split Spoon	<LOR
QC608	10/02/2011	SPT Split Spoon	<LOR
QC665	11/02/2011	SPT Split Spoon	<LOR
QC612	15/02/2011	SPT Split Spoon	TPH C15-C28 (140 µg/L) TPH C29-C36 (90 µg/L) TPH C10-C36 (Sum of Total) (230 µg/L)
QC617	24/02/2011	Submersible pump	<LOR
QC619	25/02/2011	Submersible pump	<LOR
QC620	28/02/2011	Submersible pump	<LOR
QC621	01/04/2011	SPT Split Spoon	TPH C15-C28 (110 µg/L) TPH C29-C36 (100 µg/L) TPH C10-C40 (Sum of Total) (170 µg/L)
QC624	05/04/2011	SPT Split Spoon	<LOR
QC625	06/04/2011	SPT Split Spoon	<LOR
QC626	07/04/2011	SPT Split Spoon	<LOR
QC629	08/04/2011	SPT Split Spoon	<LOR
QC630	12/04/2011	SPT Split Spoon	<LOR
QC633	13/04/2011	SPT Split Spoon	<LOR
QC635	14/04/2011	SPT Split Spoon	<LOR

Rinsate Sample ID	Date	Equipment	Results
QC636	19/04/2011	Submersible pump	Zinc (filtered) (0.001 mg/L)
QC637	20/04/2011	Submersible pump	Zinc (filtered) (0.003 mg/L)
QC646	19/05/2011	Submersible pump	Zinc (filtered) (0.004 mg/L) Phenol (0.1 µg/L)

In summary, there were very low concentrations of TPH reported in two rinsate samples out of a total of twelve rinsates for soil sampling equipment rinsates. As the concentrations were very low, they are not considered to be an indicator of a significant source of cross contamination between samples from sampling equipment

Concentrations of zinc were reported in three out of the six groundwater sampling equipment rinsate samples and phenol was detected in one rinsate sample. The results indicate that in some instances the decontamination procedures may not have been adequate enough, however as the concentrations reported in the rinsate samples were in most cases much lower than the groundwater samples they are not considered to be an indicator of a significant source of cross contamination between samples from sampling equipment.

2.7 Trip Blanks

A trip blank and trip spike assesses the potential for cross contamination during transit from the investigation site to the laboratory. Samples are typically analysed for the same contaminants targeted as part of the investigation.

Two trip soil blank samples and one water trip blank sample were utilised during storage and transport of the samples. One groundwater trip spike was utilised and analysed during storage and transport of the samples.

The trip blank and trip spike results are in laboratory reports in **Appendix H.** The samples and results are summarised in the table below.

Table 6 Summary of Trip Blank and Spike Sample Results

Batch	Field_ID	Sampled_Date	Matrix	Results
ES1102973	TB01	9/02/2011	Soil	<LOR
ES1105190	TRIP BLANK	6/04/ 2011	Soil	<LOR
ES1110584	Filtrate Blank	19/05/2011	Water	<LOR
ES1104095	TRIP BLANK	23/02/2011	Water	<LOR
ES1104095	TRIP SPIKE	23/02/2011	Water	All recoveries greater than 85%

The results indicate that there was no significant loss or gain of volatile constituents from soil and groundwater samples whilst in transit from the investigation site to the laboratory.

3.0 Laboratory QA/QC

3.1 Analytical Laboratory

Samples were submitted to the following laboratories:

- ALS Laboratory Group (ALS) in Smithfield, NSW (primary laboratory); and
- LabMark Environmental Laboratories (LabMark) in Asquith, NSW (secondary laboratory).

The ALS NATA accreditation number is 825, and its analytical procedures are based on established internationally-recognised procedures such as those published by the US EPA, APHA, AS and NEPM (1999). In house procedures are employed by ALS in the absence of documented standards.

ALS subcontracted some asbestos samples to Australian Safer Environment and Technology Pty Ltd (ASET) for analysis. ASET's NATA accreditation number is 14448.

The Labmark NATA accreditation number is 13542, and its analytical procedures are based on methods referenced from NEPC, ASTM, modified USEPA / APHA.

3.2 Analytical Methods

The laboratory analysis methods for soil and groundwater are provided on the laboratory certificates in **Appendix H** and summarised in following two tables:

Table 7 Soil Analytical Methods

Analysis	ALS Limit of Reporting	ALS Reference method	Labmark Limit of Reporting	Labmark Reference method
Metals suite comprising arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu),manganese (Mn), nickel (Ni), lead (Pb), vanadium (V) and zinc (Zn).	1 - 5 mg/kg, Ba 10 mg/kg, Al 50 mg/kg,	Acid Digestion/ICPAES (Alpha 20th 3120-(USEPA SW846, 6010)	0.1 - 5.0 mg/kg (Ba 10 mg/kg)	Acid Digestion/ICPAES (Alpha 20th 3120-(USEPA SW846, 6010)
Mercury (Hg)	0.1 mg/kg	Acid Digestion/CV-FIMS (Alpha 20th 3120-USEPA SW846, 6010)	0.1 mg/kg	Acid Digestion/CV-FIMS (Alpha 20th 3120-USEPA SW846, 6010)
Chromium VI	0.5 mg/kg	Alkaline Digestion (USEPA SW846)	1 mg/kg	Buffered Alkali Digestion/colourimetry – diphenylcarbazide (APHA 21st –USEPA 3060a)
Cyanide Total	1 mg/kg	APHA 4500-CN C&N	1 mg/kg	Neutral extraction, diffusion and colour metric determination. (ASTM Designation: D4282 and ALHA 21St Ed)
pH	0.1 pH	Electrode	0.1 pH	Electrode
PAHs/Phenols	0.5 mg/kg	Mechanical Agitation/GCMS (USEPA 8270)	0.5-1.0 mg/kg	Mechanical Agitation/GCMS (USEPA 8270)
TPH C_6-C_9	2 mg/kg	P&T/GC/MS (USEPA 5030/8260)	0.2 – 10 mg/kg	PT-GC/FID (USEPA 5030/3510/8015)
TPH C_{10}-C_{36}	50 -100 mg/kg	GC/FID (USEPA 3510/8015)	50 – 100 mg/kg	GC/FID (USEPA 3510/8015)

Analysis	ALS Limit of Reporting	ALS Reference method	Labmark Limit of Reporting	Labmark Reference method
BTEX	0.2 – 0.4 mg/kg	GC/MS (USEPA 5030/8260)	0.2-1 mg/kg	Methanol Extraction/P&T/GC/MS (USEPA5030/8260) (USEPA8015)
SVOCs	0.2 – 5 mg/kg	USEPA 5030/8260 P&T/GC/MS	0.5 – 10 mg/kg	Analysis by GC/MS (SCAN)
Asbestos*	NA	NA	ND/D	PLM & Disp Staining

Table 8 Water Analytical Results

Analysis	ALS Limit of Reporting	ALS Reference method	Labmark Limit of Reporting	Labmark reference method
Metals suite comprising arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu),manganese (Mn), nickel (Ni), lead (Pb), vanadium (V) and zinc (Zn)	As, Cr, Mn, Ni, V – 0.5 µg/L Ba, Cu – 1 µg/L Be, Co, Pb – 0.1 µg/L Cd, Co & Pb 0.2 µg/L Zn – 5 µg/L	IORC/ICP/MS Octopole Reaction Cell (APHA 3125B)		Microwave digestion with nitric acid ICPMS (USEPA 6020)ICPMS (USEPA 6020)
Hg	0.0001 mg/L	CV-FIMS (APHA 3112)	0.01µg/L	CV-FIMS (APHA 3112)
pH	0.1 pH	Electrode	0.1 pH	Electrode
TPH C_6-C_9	20 µg/L	P&T/GC/MS (USEPA 5030/8260)	1 – 50 µg/L	PT-GC/FID (USEPA 5030/5035/8260)
TPH C_{10}-C_{36}	50 – 100 µg/L	GC/FID (USEPA 3510/8015)	50 – 200 µg/L	GC/FID USEPA 3510/8015)
BTEX	1 – 4 µg/L	P&T/GCMS (USEPA5030/8260)	1 – 2 µg/L	P-T/GCMS (USEPA 5030/8260)
PAHs/Phenols	0.05 – 0.1 µg/L (UT)	GPC-GC/MS-SIM (USEPA 3640/8270)	0.01 - 0.02 µg/L (TL)	GC/MS (USEPA 3510/8270)
Free and total cyanide	1 mg/kg	APHA 4500-CNC& N	0.005 – 0.01 mg/L	Diffusion cell / Colourimetric
WAD Cyanide	0.004 mg/L	APHA 4500-CNC&N	0.01 mg/L	Weak acid distillation / Colourimetric (APHA 21st)
Ammonia	1 mg/L	APHA 4500-NH3 G	0.02 mg/L	In-house method E036.1

3.3 Laboratory (Method) Blanks

Laboratory method or control blanks consist of reagents specific to each individual analytical method and are prepared and analysed by laboratories in the same manner as regular samples. The preparation and analysis of laboratory blanks enables the measurement of contamination within the laboratory.

Laboratory blanks are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per batch. For this investigation, method blank was analysed in each soil and groundwater batch.

Review of the laboratory QA/QC reports indicated that the results for all method blanks were below the laboratory detection limit.

3.4 Laboratory Duplicates

Laboratory duplicate samples are prepared in the laboratory by splitting a field sample and analysing it as two independent samples. The analysis of laboratory duplicate samples provides an indication of analytical precision and may be influenced by sample heterogeneity. The laboratory duplicate RPDs are used to assess laboratory precision.

Laboratory duplicates are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per batch. Laboratory duplicates were analysed at an appropriate frequency (1 in 5 to 1 in 7) in all batches.

Review of the laboratory QA/QC reports indicated that the RPDs for all laboratory duplicate samples were within the DQI acceptance criteria, with the following exceptions summarised in the table below.

Table 9 Summary of Laboratory Duplicate DQI exceedences

Batch	Sample Code	Chemical Name	RPD (%)	Matrix
290235-S	11-FE31149	Cadmium	80	Soil
296313-S	S11-Ap31259	Mercury Nickel	97 91	Soil
S11-MA30474	S11-MA30474	WAD cyanide	169	Water

The above laboratory duplicate soil exceedences were from the secondary laboratory. As there were no laboratory duplicate exccedences from the primary laboratory the results indicate that the laboratory precision was acceptable for this investigation.

The water matrix laboratory duplicate sample above can be attributed to low concentrations detected (equal to and less than 10 times the LOR).

3.5 Laboratory Control Samples

Laboratory control samples (LCS) or Quality Control check samples are prepared within the laboratory by spiking an aliquot of an appropriate clean matrix reagent with known concentrations of specific analytes. The LCS sample is then analysed and the results are used to assess the laboratory performance on sample preparation and analysis procedure. Certified reference material may also be used to assess analytical accuracy independent of the investigations. Accuracy is assessed by calculation of percent recovery.

LCSs are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch. For this investigation, LCSs were analysed at an appropriate rate (1 per batch).

Review of the laboratory QA/QC reports indicated that the percent recoveries for LCSs were within the DQI acceptance criteria (70-130%) or the Laboratory Analyte Specific Acceptance Criteria (ASAC), with the exception of those listed in the below table.

Table 10 Summary of laboratory control sample DQI exceedences

Batch	Sample Code	Chemical Name	Result (%)	Matrix
ES1104095	1987030-002	N-2-Fluorenyl Acetamide	40.5	Soil (Filter Paper)
ES1104220	1987030-002	N-2-Fluorenyl Acetamide	40.5	Soil (Filter Paper)
ES1104095	1987002-007	2-Chlorophenol Acenaphthene Fluoranthene	62.4 62.1 63.2	Water
ES1104161	1987002-007	2-Chlorophenol Acenaphthene Fluoranthene	62.4 62.1 63.2	Water
ES1104220	1987002-007	2-Chlorophenol Acenaphthene Fluoranthene	62.4 62.1 63.2	Water

There were no LCS recoveries outside the acceptable DQI range for soil and only three out of 134 water samples with LCS recoveries outside the acceptable DQI range.

Based on this and the DQI's for this project the LCS recoveries indicate that the accuracy of the results is acceptable.

3.6 Matrix Spikes

Matrix spikes are samples prepared within the laboratory by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes. The matrix spike and matrix spike duplicate are then analysed separately and the results compared to determine the effects of the sample matrix on the accuracy and precision of the analytes. Accuracy is assessed by the calculation of the percent recovery.

Review of the laboratory QA/QC reports indicated that the percent recoveries for matrix spikes were within the DQI acceptance criteria (70-130%) or the Laboratory Analyte Specific Acceptance Criteria (ASAC), with the exception of those listed in the below table.

Table 11 Summary of Matrix Spike Recovery DQI exceedences

Batch	Sample Code	Chemical Name	Recovery (%)	Matrix
ES1102973	EN1100362-002	Copper	Not determined as background levels >= 4 x spike level	Water
ES1103094	ES1103095-002	TPH C15-C28	Not determined as background levels >= 4 x spike level	Water
ES1103336	ES1103309-006	Zinc	Not determined as background levels >= 4 x spike level	Water
ES1104964	ES1104964-002	Ammonia as N	Not determined as background levels >= 4 x spike level	Soil
	ES1105032-001	Benzene	Not determined as background levels >= 4 x spike level	Water
ES1105851	ES1105851-001	2-Chlorophenol 4-Chloro-3-methylphenol m-Cresol o-Cresol p-Cresol 2,4-Dichlorophenol 2,6-Dichlorophenol 2,4-Dimethylphenol Hexachlorophene 2-Nitrophenol 4-Nitrophenol Pentachlorophenol Phenol 2,3,4,6-Tetrachlorophenol 2,4,5-Trichlorophenol 2,4,6-Trichlorophenol	Not determined due to sample matrix interference	Soil
ES1107519	ES1107462-003	Zinc	Not determined as background levels >= 4 x spike level	Soil
ES1104095	ES1104095-001	Manganese	Not determined as background levels >= 4 x spike level	Water
ES1104161	ES1104095-001	Free Cyanide	47.3	Water
ES1108478	ES1108479-006	Manganese	Not determined as background levels >= 4 x spike level	Water

With the exception of three samples where matrix spike recoveries not being determined due to high background concentrations, all 76 soil matrix spike recoveries met the acceptable DQI limits.

There was one sample out of 95 with a matrix spike recovery outside the acceptable DQI range.

Based on this the matrix spike recoveries and the DQI's for this project, the accuracy of the results are acceptable.

3.7 Surrogates

Surrogates are compounds which are similar to the organic analytes of interest in chemical composition, extraction, and chromatographic behaviour, but which are not normally found in field samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatogaphic methods. Percent recoveries are calculated for each surrogate, providing an indication of analytical accuracy. US EPA methodology (SW – 846) requires that surrogate testing be performed whenever analysing by Gas Chromatography or HPLC.

Review of the laboratory QA/QC reports indicated that the percent recoveries for surrogates were within the DQI acceptance criteria (70-130%) or the Laboratory Analyte Specific Acceptance Criteria (ASAC), with the exception of those listed in the below table.

Table 12 Summary of surrogate sample recoveries DQI exceedences

Batch	Sample Code	Chemical Name	Recovery (%)	Matrix
ES1102875	ES1102875-015	4-Bromofluorobenzene	131	Soil
ES1102973	ES1102973-003	Phenol-d6	48.5	Soil
ES1104095	ES1104095-007	2-Fluorobiphenyl Anthracene-d10 4-Terphenyl	Surrogate recovery not determined due to matrix interference	Filter Paper
	ES1104095-008			
	ES1104095-009			
	ES1104095-010			
	ES1104095-011			
	ES1104095-012			
	ES1104095-016			
	ES1104095-017			
ES1104161	ES1104161-009	2-Fluorobiphenyl Anthracene-d10 4-Terphenyl	Surrogate recovery not determined due to matrix interference	Filter Paper
	ES1104161-010			
	ES1104161-011			
	ES1104161-012			
	ES1104161-013			
	ES1104161-014			
	ES1104161-015			
	ES1104161-016			
	ES1104161-017			
	ES1104161-018			
	ES1104161-019			
	ES1104161-020			
	ES1104161-021			
	ES1104161-022			
	ES1104161-023			
	ES1104161-024			
	ES1104161-033			
	ES1104161-034			
ES1104220	ES1104220-007	2-Fluorobiphenyl Anthracene-d10 4-Terphenyl	Surrogate recovery not determined due to matrix interference	Filter Paper
	ES1104220-008			
	ES1104220-009			
	ES1104220-010			

Batch	Sample Code	Chemical Name	Recovery (%)	Matrix
	ES1104220-011			
	ES1104220-012			
	ES1104220-013			
	ES1104220-014			
	ES1104220-019			
	ES1104220-020			
ES1103957	ES1103957-002	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14	Surrogate recovery not determined due to matrix interference	TCLP Leachate
	ES1103957-004	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
ES1103960	ES1103960-005	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4		DI Water Leachate
	ES1103960-002	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1103960-004	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1103960-006	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1103960-008	2-Chlorophenol-D4	137	
	ES1103960-009	2-Fluorobiphenyl	131	
	ES1103960-009	2-Fluorophenol	Surrogate recovery not	

Batch	Sample Code	Chemical Name	Recovery (%)	Matrix
ES1104964	ES1104964-004	2-Fluorophenol Phenol-d6	determined due to matrix interference	Soil
	ES1104964-007	2-Fluorophenol Phenol-d6		DI Water Leachate
	ES1104964-006	2-Fluorobiphenyl	142	
	ES1104964-005	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14	Surrogate recovery not determined due to matrix interference	
ES1105851	ES1105851-001	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		Soil
	ES1105851-002	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1105851-003	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1105851-005	2-Fluorophenol Phenol-d6		
	ES1105851-007	2-Fluorophenol Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1105851-009	Phenol-d6 2-Chlorophenol-D4 2-Fluorobiphenyl Anthracene-d10		
ES1104161	ES1104161-001	Phenol-d6 2-Chlorophenol-D4 2-Fluorobiphenyl		Water

Batch	Sample Code	Chemical Name	Recovery (%)	Matrix
	ES1104161-002	Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1104161-005	Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1104161-008	Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
ES1104220	ES1104220-001	Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		Water
	ES1104220-004	Phenol-d6 2-Chlorophenol-D4 2.4.6-Tribromophenol 2-Fluorobiphenyl Anthracene-d10 4-Terphenyl-d14		
	ES1104220-018	Phenol-d6 2-Chlorophenol-D4 2-Fluorobiphenyl		

There were only 2 out of 144 soil (1%) and no water surrogate samples with recoveries outside the acceptable DQI range for the compounds listed in the above table. Based on this the surrogate recoveries indicate that the accuracy of the results is acceptable.

It is noted that there were also three samples with surrogate recoveries greater than the upper DQI recovery limit for surrogates for deionised water leachate.

3.8 Holding Times

NEPC (1999), APHA 20th Edition and AS2031.1-1986 present recommended holding times for various analyses (under specified conditions, for example below 4°C in an airtight container), which must be met in order to consider the results valid. The holding times may vary slightly depending on the document referenced.

Recommended holding times are summarised in the below table.

Table 13 Summary of Recommended Holding Times

Analyte	Matrix	Recommended Maximum Holding Time
Metals	Soil / Water	6 months – metals 1 day - Ferrous Iron

Analyte	Matrix	Recommended Maximum Holding Time
Mercury	Soil / Water	28 days
TPH C_6-C_9	Soil / Water	14 days / 7 days
TPH C_{10}-C_{36}	Soil / Water	14 days / 7 days
BTEX	Soil / Water	14 days / 14 days (with HCl)
SVOCs	Soil / Water	14 days / 7 days
OCPs/PCBs	Soil / Water	14 days / 7 days
Free and WAD Cyanide	Soil / Water	7 days/14 days
pH	Soil / Water	7 days/6 hours
Organic Matter (TOC)	Soil / Water	7 days
ASS (SPOCAS)	Soil	Indefinite (freeze) 24 hours (4ºC)
TCLP Metals	Soil	6 months
TCLP Organics	Soil	14 days
Anions/Cations	Water	28 days 2 days (Nitrate/Nitrite/Reactive phosphorus) 14 days (Acid/Alkalinity)
VOCs	Soil / Water	14 days
Asbestos	Soil	NA

All analyses undertaken for the original scope of work for the VMP DGI were within holding times.

It is noted that additional analyses were requested at a later date than the original analysis request due to additional data being required to assist in the HHERA. Holding time exceedences for these samples are summarised below.

Table 14 Summary of Holding Time Exceedences

Batch	Analyte	Matrix	Non-compliance
ES1103957	Leach for Organics	TCLP Leachate	4 days overdue: BH403_8.0-8.4 BH403_12.0-12.4 BH405_7.0-7.3
			3 days overdue: BH405_7.0-7.3
ES1103960	Leach for Organics	Soil	5 days overdue: BH406_7.0-7.4
			4 days overdue: BH403_8.0-8.4 BH403_12.0-12.4 BH406_16.0-16.5
			3 days overdue: BH405_7.0-7.3
			2 days overdue: BH405_14.0-14.4
ES1104964	Moisture Content	Soil	15 days overdue:

Batch	Analyte	Matrix	Non-compliance
			BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			14 days overdue: BH401_10.0-10.4 BH402_16.0-16.3
			13 days overdue: BH401_20.0-20.15
			10 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			9 days overdue: BH409_6.0-6.4
	Total Cyanide	Soil	26 days overdue: BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			25 days overdue: BH401_10.0-10.4 BH402_16.0-16.3
			24 days overdue: BH401_20.0-20.15
			21 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			20 days overdue: BH409_6.0-6.4
	Leach for Organics	Soil	17 days overdue: BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			16 days overdue: BH402_16.0-16.3
			12 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			11 days overdue: BH409_6.0-6.4
	Deionised water ZHE for VOC and CN	Soil	27 days overdue: BH402_15.0-15.5 BH403_10.0-10.4
			28 days overdue: BH403_15.0-15.4
			25 days overdue: BH401_10.0-10.4
			26 days overdue: BH402_16.0-16.3
			25 days overdue: BH401_20.0-20.15

Batch	Analyte	Matrix	Non-compliance
			21 days overdue: BH400_15.0-15.4
			23 days overdue: BH407_15.1-15.45
			22 days overdue: BH409_6.0-6.4
	Monocyclic Aromatic Hydrocarbons	Soil	20 days overdue: BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			19 days overdue: BH401_10.0-10.4 BH402_16.0-16.3
			18 days overdue: BH401_20.0-20.15
			15 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			14 days overdue: BH409_6.0-6.4
	PAHs, Anilines and Benzidines	Soil	15 days overdue: BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			14 days overdue: BH401_10.0-10.4 BH402_16.0-16.3
			13 days overdue: BH401_20.0-20.15
			10 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			9 days overdue: BH409_6.0-6.4
	TPHs	Soil	20 days overdue: BH402_15.0-15.5 BH403_10.0-10.4 BH403_15.0-15.4
			19 days overdue: BH401_10.0-10.4 BH402_16.0-16.3
			18 days overdue: BH401_20.0-20.15
			15 days overdue: BH400_15.0-15.4 BH407_15.1-15.45
			14 days overdue: BH409_6.0-6.4
ES1105851	Phenolic compounds	Soil	26 days overdue:

Batch	Analyte	Matrix	Non-compliance
			BH406_16.0-16.5 BH403_8.0-8.4 BH403_12.0-12.4
			25 days overdue: BH405_7.0-7.3
			24 days overdue: BH405_14.0-14.4
			21 days overdue: BH409_3.7-4.0 BH408_2.0-2.4
			20 days overdue: BH409_7.0-7.3 BH408_9.0-9.4
292248-W	Phenolic compounds	Water	1 day overdue: QC616
	PAHs	Water	1 day overdue: QC616

4.0 Data Validation

The overall assessment of the quality of the data obtained during this investigation is discussed below in terms of the data quality indicators provided above.

Non-compliances are to be documented and discussed in the report. The DQIs are as follows:

Table 15 Overall Assessment of DQIs

DQI	Description	Compliance
Completeness	Completeness is a measure of the amount of usable data (expressed as %) from a data collection activity.	The completeness of data is defined as the percentage of analytical results that are considered valid. Valid chemical data are values that have been identified as acceptable or acceptable as qualified during the data validation process. The completeness is a comparison of the total number of samples accepted against the total number of samples, calculated as a percentage. The project goal for completeness is 95%. Completeness also includes checking that all entries in the data tables are correct, properly entered, and that any typographical errors are corrected and the data are re-entered properly, as required. Approximately 95% of the samples collected and analysed complied with the DQOs and DQIs, as such the data obtained is considered to be sufficiently quantitative and complete for the purposes of this investigation (i.e. >95%)

DQI	Description	Compliance
Comparability	Comparability is the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.	Comparability expresses the confidence with which one data set can be compared with another. In order to assess comparability, field sampling procedures, laboratory sample preparation procedures, analytical procedures, and reporting units must be known and similar to established protocols, as was the case during this investigation. Qualitatively, data subjected to strict QA/QC procedures will be deemed more reliable, and therefore more comparable, than other data. The sampling was conducted by AECOM Environmental Scientists in accordance with AECOM sampling and analysis procedures. Each analyte was analysed by the same analytical laboratory using identical methods, and laboratory LORs were consistent over each laboratory batch. Additionally, a check laboratory was used to assess variability between laboratories. Based on the above, the data obtained throughout the investigation is considered to be suitably comparable.
Representativeness	Representativeness is the confidence (expressed qualitatively) that data are representative of each media present on the site.	Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of parameter variations at sampling points or environmental conditions. Sample representativeness is controlled through selecting sampling locations that exemplify site conditions and obtaining suitable samples from these sites. Sample selection and analysis was conducted in order to meet the specific objectives of the project. Analysis for the contaminants of concern was selectively conducted on soil samples as indicated in analytical tables. Based on the sampling and analytical regime undertaken by AECOM, the results obtained are considered to be sufficiently representative of the subsurface conditions at the locations tested.
Precision	Precision is a quantitative measure of the variability (or reproducibility) of data.	All work was conducted in accordance with AECOM's documented SOPs. Precision or variability of the data was assessed by determining RPDs between the original and duplicate samples analysed. Variability was noted in concentrations of CoPC both in fill and natural soil. The variability in fill can be attributed to the heterogeneous nature of the fill at the Site. The elevated RPDs in natural soil samples corresponded with samples with high concentrations of TPH, PAH or BTEX and observations of black staining and tar/hydrocarbon odours. The variation in concentrations within fill and natural samples will be taken into consideration when assessing these locations against the adopted assessment criteria.
Accuracy	Accuracy is a quantitative measure of the closeness of reported data to the true value.	All work was conducted in accordance with AECOM's documented SOPs. Accuracy of the data was mainly assessed through review of the laboratory QA/QC results, though the rinsate blanks also contributed to the assessment of accuracy. Based on results discussed above, AECOM considers that the accuracy of the data is sufficient for the purposes of this investigation.

D R A F T

Based on an assessment of field and laboratory QA/QC data, the reported analytical results are considered, by achievement of the DQIs, to be reliable and representative of concentrations of the compounds analysed at the locations sampled.

AECOM

Appendix F
Table 1
Soil QA/QC - Field Duplicates

Sample_Depth_Range	8-8.4	8-8.4		9-9.4	9-9.4		14-14.4	14-14.4		14-14.4	14-14.4		14-14.5	14-14.5		14-14.5
Field_ID	BH403_8.0-8.4	QC656		BH408_9.0-9.4	QC613		BH404_14-14.4	QC653		BH405_14.0-14.4	QC609		BH407_14.0-14.5	QC610		BH407_14.0-14.5
Matrix_Type	SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL
Sample_Type	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal
SDG	ES1102973	ES1102973		ES1103336	ES1103336		ES1102875	ES1102875		ES1103042	ES1103042		ES1103100	ES1103100		ES1103100
Monitoring_Zone	Block 5	Block 5		VMP & PDA - Block 4	VMP & PDA - Block 4		Block 4	Block 4		VMP & PDA - Block 4	VMP & PDA - Block 4		Proposed Southern Cove	Proposed Southern Cove		Proposed Southern Cove
Location_Code	BH403	BH403		BH408	BH408		BH404	BH404		BH405	BH405		BH407	BH407		BH407
Sampled_Date_Time	9/02/2011	9/02/2011	%	15/02/2011	15/02/2011	%	8/02/2011	8/02/2011	%	11/02/2011	11/02/2011	%	14/02/2011	14/02/2011	%	14/02/2011

Chem_Group	ChemName	output unit	EQL														
	CPAH (ESDAT)	mg/kg		438.6	214.9	***68.5***	35	9	***118.2***	89.4	68	*27.2*	551.4	543.1	*1.5*	<4	<4	*nc*	<4
BTEX	Total Xylene (ESDAT)	mg/kg	0.15	10.2	3.1	***106.8***	8.9	2.2	***120.7***	35.1	25.1	*33.2*	76.6	5.4	***173.7***	<1	<1	*nc*	<1
	Benzene	mg/kg	0.2	4.2	3.5	*18.2*	2.1	0.5	***123.1***	11.5	9.8	*16.0*	5.9	0.6	***163.1***	0.2	0.3	*40.0*	0.2
	Ethylbenzene	mg/kg	0.5	4.3	2.4	***56.7***	4.6	1	***128.6***	14.5	9.8	*38.7*	4	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5
	Toluene	mg/kg	0.5	5	0.9	***139.0***	<0.5	<0.5	*nc*	6.6	7.1	*7.3*	33	2.7	***169.7***	<0.5	<0.5	*nc*	<0.5
	Xylene (m & p)	mg/kg	0.5	6.6	1.9	***110.6***	5.1	1.2	***123.8***	26.5	19.3	*31.4*	57.2	4	***173.9***	<0.5	<0.5	*nc*	<0.5
	Xylene (o)	mg/kg	0.5	3.6	1.2	***100.0***	3.8	1	***116.7***	8.6	5.8	*38.9*	19.4	1.4	***173.1***	<0.5	<0.5	*nc*	<0.5
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	10,000	<20,000		*nc*	<50,000		*nc*				<20,000						
	2,4,5-trichlorophenol	mg/kg	0.5	<20,000		*nc*	<50,000		*nc*				<20,000						
	2,4,6-trichlorophenol	mg/kg	0.5	<20,000		*nc*	<50,000		*nc*				<20,000						
	2,4-dichlorophenol	mg/kg	0.5	<20,000		*nc*	<50,000		*nc*				<20,000						
	2,6-dichlorophenol	mg/kg	0.5	<20,000		*nc*	<50,000		*nc*				<20,000						
	2-chlorophenol	mg/kg	0.5	<20,000		*nc*	<50,000		*nc*				<20,000						
	Pentachlorophenol	mg/kg	2	<20,000		*nc*	<50,000		*nc*				<20,000						
Other	Cyanide Total	mg/kg	1																
	pH (Final)	pH	0.1	6.4		*nc*	7.9		*nc*				8.7						
	pH (Initial)	pH_Units	0.1	9.1		*nc*													
	Moisture	PERCENT_WW	1	38.7	43.7	*12.1*	17.2	16.3	*5.4*	30.4	27.1	*11.5*	17.8	16.4	*8.2*	16.7	17.9	*6.9*	16.7
	Moisture Content (dried @ 103°C)	%	0.1																
	pH (after HCL)	pH	0.1	1.8		*nc*													
Lead	Lead	mg/kg	2	289	379	*26.9*	5	6	*18.2*	804	334	***82.6***	20	20	*0.0*	6	8	*28.6*	6
Metals	Arsenic	mg/kg	1	16	21	*27.0*	6	8	*28.6*	28	21	*28.6*	<5	<5	*nc*	<5	<5	*nc*	<5
	Cadmium	mg/kg	0.1	<1	1	***nc***	<1	<1	*nc*	2	1	***66.7***	<1	<1	*nc*	<1	<1	*nc*	<1
	Chromium	mg/kg	1	42	34	*21.1*	20	20	*0.0*	53	29	***58.5***	4	9	***76.9***	6	7	*15.4*	6
	Copper	mg/kg	2	156	184	*16.5*	<5	<5	*nc*	228	132	***53.3***	<5	<5	*nc*	<5	<5	*nc*	<5
	Mercury	mg/kg	0.05	8.3	7.2	*14.2*	<0.1	<0.1	*nc*	5	2.6	***63.2***	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*	<0.1
	Nickel	mg/kg	1	20	18	*10.5*	<2	<2	*nc*	18	12	*40.0*	<2	<2	*nc*	2	2	*0.0*	2
	Zinc	mg/kg	5	404	467	*14.5*	<5	<5	*nc*	665	508	*26.8*	<5	7	*nc*	<5	<5	*nc*	<5
Other	Polycylic aromatic hydrocarbons EPA448	mg/kg	0.5																
	TCLP Fluid	-	1	1		*nc*													
	Total BTEX	mg/kg	1																
PAH/Phenols	PAH (ESDAT TOTAL)	mg/kg		1543.2	539.3	***96.4***	252.6	70.3	***112.9***	371.4	283	*27.0*	3296.3	3170.3	*3.9*	<8	<8	*nc*	<8
	PAH (total, NSW Waste 2008)	mg/kg		1543.2	539.3	***96.4***	252.6	70.3	***112.9***	371.4	283	*27.0*	3296.3	3170.3	*3.9*	<8	<8	*nc*	<8
	Sum of 10 PAHs	mg/kg		851.6	425.8	***66.7***	67.8	18.4	***114.6***	192.9	155.3	*21.6*	1102.4	1072.1	*2.8*	<5	<5	*nc*	<5
	Sum of 5 PAHs	mg/kg		691.6	113.5	***143.6***	184.8	51.9	***112.3***	178.5	127.7	*33.2*	2193.9	2098.2	*4.5*	<3	<3	*nc*	<3
	2,4-dimethylphenol	mg/kg	0.5	1.34		*nc*	<0.05		*nc*				4.9						
	2-methylphenol	mg/kg	0.5	1.55		*nc*	<0.05		*nc*				1.5						
	2-nitrophenol	mg/kg	0.5	<0.02		*nc*	<0.05		*nc*				<0.02						
	3-&4-methylphenol	mg/kg	1																
	3-Methylphenol	mg/kg	0.01	2		*nc*	<0.05		*nc*				0.92						
	4-chloro-3-methylphenol	mg/kg	0.0005	<0.02		*nc*	<0.05		*nc*				<0.02						
	4-methylphenol	mg/kg	0.01	1.37		*nc*	<0.05		*nc*				0.51						
	4-nitrophenol	mg/kg	0.01	<0.02		*nc*	<0.05		*nc*				<0.02						
	Acenaphthene	mg/kg	0.5	37.4	6.6	***140.0***	4.2	1.1	***117.0***	10.6	7.8	*30.4*	44.9	43.2	*3.9*	<0.5	<0.5	*nc*	<0.5
	Acenaphthylene	mg/kg	0.5	48.2	20.2	***81.9***	22.9	6.6	***110.5***	11.6	9.2	*23.1*	221	213	*3.7*	<0.5	<0.5	*nc*	<0.5
	Anthracene	mg/kg	0.5	98	19.8	***132.8***	12.5	3.9	***104.9***	13.9	11.8	*16.3*	182	168	*8.0*	<0.5	<0.5	*nc*	<0.5
	Benz(a)anthracene	mg/kg	0.5	112	46.8	***82.1***	9.7	2.5	***118.0***	21.9	16.6	*27.5*	130	129	*0.8*	<0.5	<0.5	*nc*	<0.5
	Benzo(a) pyrene	mg/kg	0.5	70.5	36.8	***62.8***	5.6	1.4	***120.0***	11.6	10.2	*12.8*	86.2	84.8	*1.6*	<0.5	<0.5	*nc*	<0.5
	Benzo(b)&(k)fluoranthene	mg/kg	1																
	Benzo(b)fluoranthene	mg/kg	0.5	84.9	41.7	***68.2***	4.6	1.1	***122.8***	20	15.6	*24.7*	96.3	94.3	*2.1*	<0.5	<0.5	*nc*	<0.5
	Benzo(g,h,i)perylene	mg/kg	0.5	27.5	18.6	*38.6*	2.6	0.6	***125.0***	5.2	4.5	*14.4*	49.1	47.7	*2.9*	<0.5	<0.5	*nc*	<0.5
	Benzo(k)fluoranthene	mg/kg	0.5	34.4	18	***62.6***	2.3	0.5	***128.6***	9	4.5	***66.7***	44.5	45.1	*1.3*	<0.5	<0.5	*nc*	<0.5
	Chrysene	mg/kg	0.5	77.6	34.3	***77.4***	7.6	1.9	***120.0***	15.7	11.2	*33.5*	93	90.2	*3.1*	<0.5	<0.5	*nc*	<0.5
	Dibenz(a,h)anthracene	mg/kg	0.5	7.3	4.1	***56.1***	0.6	<0.5	*nc*	1.4	1.2	*15.4*	10.3	10.4	*1.0*	<0.5	<0.5	*nc*	<0.5
	Fluoranthene	mg/kg	0.5	227	96.9	***80.3***	14.5	4.2	***110.2***	52.5	44.7	*16.0*	301	290	*3.7*	<0.5	<0.5	*nc*	<0.5
	Fluorene	mg/kg	0.5	95	8.7	***166.4***	16.6	4.8	***110.3***	15.6	9.3	***50.6***	236	208	*12.6*	<0.5	<0.5	*nc*	<0.5
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	24.4	14.6	***50.3***	2	<0.5	*nc*	4.6	4.2	*9.1*	42	41.6	*1.0*	<0.5	<0.5	*nc*	<0.5
	Naphthalene	mg/kg	0.5	146	8.3	***178.5***	89.8	23.8	***116.2***	88	60.6	*36.9*	1040	1010	*2.9*	<0.5	<0.5	*nc*	<0.5
	PAHs (Sum of total)	mg/kg	1																
	Phenanthrene	mg/kg	0.5	267	49.9	***137.0***	38.8	11.7	***107.3***	38.8	29	*28.9*	470	456	*3.0*	<0.5	<0.5	*nc*	<0.5
	Phenol	mg/kg	0.5	2		*nc*	<0.05						<0.02		*nc*				
	Pyrene	mg/kg	0.5	186	114	*48.0*	18.3	5.2	***111.5***	51	42.6	*17.9*	250	239	*4.5*	<0.5	<0.5	*nc*	<0.5
SVOCs	Dibenzofuran	mg/kg	0.5																
	Hexachlorophene	mg/kg	0.01	<0.02		*nc*	<0.05		*nc*				<0.02		*nc*				
TPH	TPH C15-C36	mg/kg		12,470	8400	*39.0*	860	360	***82.0***	2060	1880	*9.1*	9030	7650	*16.5*	<200	<200	*nc*	<200
	TPH C10 - C14	mg/kg	50	1300	320	***121.0***	360	110	***106.4***	<50	<50	*nc*	3390	3020	*11.5*	<50	<50	*nc*	<50
	TPH C15-C28	mg/kg	100	8870	5480	*47.2*	710	260	***92.8***	1280	1160	*9.8*	7020	5950	*16.5*	<100	<100	*nc*	<100
	TPH C29-C36	mg/kg	100	3600	2920	*20.9*	150	<100	*nc*	780	720	*8.0*	2010	1700	*16.7*	<100	<100	*nc*	<100
	TPH C6 - C9	mg/kg	10	31	15	***69.6***	24	<10	*nc*	125	87	*35.8*	156	10	***175.9***	<10	<10	*nc*	<10
	TPH+C10 - C36 (Sum of total)	mg/kg	50	13,770	8720	*44.9*	1220	370	***106.9***	2060	1880	*9.1*	2,420	10,670	***126.1***	<50	<50	*nc*	<50
	TPH C10 - C40 (Sum of total)	mg/kg	50																
	TPH C6-C10	mg/kg	10																

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Appendix F
Table 1
Soil QA/QC - Field Duplicates

Sample_Depth_Range	14-14.5		15-15.4	15-15.4		15-15.4	15-15.4		15-15.5	15-15.5		15-15.5	15-15.5		17-17.4	17-17.4		17-17.4	17-17.4	
Field_ID	QC611		BH406_15.0-15.4	QC602		BH406_15.0-15.4	QC603		BH413_15.0-15.5	QC622		BH413_15.0-15.5	QC623		BH402_17.0-17.4	QC606		BH402_17.0-17.4	QC607	
Matrix_Type	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL	
Sample_Type	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD
SDG	290645		ES1102875	ES1102875		ES1102875	290188		ES1107354	ES1107354		ES1107354	295989		ES1102973	ES1102973		ES1102973	290235	
Monitoring_Zone	Proposed Southern Cove		Block 4	Block 4		Block 4	Block 4		L	L		L	L		Block 5	Block 5		Block 5	Block 5	
Location_Code	BH407		BH406	BH406		BH406	BH406		BH413	BH413		BH413	BH413		BH402	BH402		BH402	BH402	
Sampled_Date_Time	14/02/2011	%	8/02/2011	8/02/2011	%	8/02/2011	8/02/2011	%	5/04/2011	5/04/2011	%	5/04/2011	5/04/2011	%	10/02/2011	10/02/2011	%	10/02/2011	10/02/2011	%

Chem_Group	ChemName	output unit	EQL																		
	CPAH (ESDAT)	mg/kg			*nc*	151.2	93	***47.7***	151.2		*nc*	41.8	46.7	***11.1***	41.8		*nc*	387.5	215.2	***57.2***	387.5	208.4	***60.1***
BTEX	Total Xylene (ESDAT)	mg/kg	0.15	<0.15	*nc*	50	105.4	***71.3***	50	36	*32.6*	<0.5	<0.5	*nc*	<0.5	<0.15	*nc*	174.1	81.5	***72.5***	174.1	116	*40.1*
	Benzene	mg/kg	0.2	<0.5	*nc*	15.1	35.8	***81.3***	15.1	11	*31.4*	<0.2	<0.2	*nc*	<0.2	<0.5	*nc*	63.4	32	***65.8***	63.4	40	*45.3*
	Ethylbenzene	mg/kg	0.5	<0.5	*nc*	3.2	6.8	***72.0***	3.2	2.4	*28.6*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	9	4.1	***74.8***	9	<5	*nc*
	Toluene	mg/kg	0.5	<0.5	*nc*	31	68.6	***75.5***	31	24	*25.5*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	127	57.9	***74.7***	127	87	*37.4*
	Xylene (m & p)	mg/kg	0.5	<1	*nc*	36.9	76.6	***70.0***	36.9	26	*34.7*	<0.5	<0.5	*nc*	<0.5	<1	*nc*	128	60	***72.3***	128	80	*46.2*
	Xylene (o)	mg/kg	0.5	<0.5	*nc*	13.1	28.8	***74.9***	13.1	9.7	*29.8*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	46.1	21.5	***72.8***	46.1	36	*24.6*
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	10,000																				
	2,4,5-trichlorophenol	mg/kg	0.5																				
	2,4,6-trichlorophenol	mg/kg	0.5																				
	2,4-dichlorophenol	mg/kg	0.5																				
	2,6-dichlorophenol	mg/kg	0.5																				
	2-chlorophenol	mg/kg	0.5																				
	Pentachlorophenol	mg/kg	2																				
Other	Cyanide Total	mg/kg	1																				
	pH (Final)	pH	0.1																				
	pH (Initial)	pH_Units	0.1																				
	Moisture	PERCENT_WW	1		*nc*	13.5	13.6	*0.7*	13.5		*nc*	33.5	34	*1.5*	33.5		*nc*	16.1	16.4	*1.8*	16.1		*nc*
	Moisture Content (dried @ 103°C)	%	0.1	21	*nc*					14	*nc*					33	*nc*					17	*nc*
	pH (after HCL)	pH	0.1																				
Lead	Lead	mg/kg	2	7.7	*24.8*	7	6	*15.4*	7	6.4	*9.0*	429	544	*23.6*	429	220	***64.4***	8	7	*13.3*	8	6.1	*27.0*
Metals	Arsenic	mg/kg	1	<2	*nc*	<5	<5	*nc*	<5	<2	*nc*	8	8	*0.0*	8	3.5	***78.3***	<5	<5	*nc*	<5	<2	*nc*
	Cadmium	mg/kg	0.1	<0.5	*nc*	<1	<1	*nc*	<1	<0.5	*nc*	<1	<1	*nc*	<1	0.2	***nc***	<1	<1	*nc*	<1	<0.5	*nc*
	Chromium	mg/kg	1	9.7	*47.1*	5	5	*0.0*	5	5.5	*9.5*	19	21	*10.0*	19	6.5	***98.0***	7	13	***60.0***	7	6	*15.4*
	Copper	mg/kg	2	<5	*nc*	<5	<5	*nc*	<5	<5	*nc*	71	66	*7.3*	71	35	***67.9***	<5	5	*nc*	<5	<5	*nc*
	Mercury	mg/kg	0.05	<0.1	*nc*	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*	1	1	*0.0*	1	0.39	***87.8***	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*
	Nickel	mg/kg	1	<5	*nc*	<2	<2	*nc*	<2	<5	*nc*	8	9	*11.8*	8	4.1	***64.5***	2	3	*40.0*	2	<5	*nc*
	Zinc	mg/kg	5	<5	*nc*	<5	<5	*nc*	<5	5.6	*nc*	310	378	*19.8*	310	150	***69.6***	7	11	*44.4*	7	12	***52.6***
Other	Polycylic aromatic hydrocarbons EPA448	mg/kg	0.5																				
	TCLP Fluid	-	1																				
	Total BTEX	mg/kg	1	<1	*nc*					73	*nc*					<1	*nc*					250	*nc*
PAH/Phenols	PAH (ESDAT TOTAL)	mg/kg			*nc*	1064	630.7	***51.1***	1064		*nc*	82.8	93.8	*12.5*	82.8		*nc*	2865.2	1465.5	***64.6***	2865.2	2445.4	*15.8*
	PAH (total, NSW Waste 2008)	mg/kg			*nc*	1064	630.7	***51.1***	1064		*nc*	82.8	93.8	*12.5*	82.8		*nc*	2865.2	1465.5	***64.6***	2865.2	2445.4	*15.8*
	Sum of 10 PAHs	mg/kg			*nc*	326.4	203.1	*46.6*	326.4		*nc*	71.1	80	*11.8*	71.1		*nc*	916.5	491.2	***60.4***	916.5	508.4	***57.3***
	Sum of 5 PAHs	mg/kg			*nc*	737.6	427.6	***53.2***	737.6		*nc*	11.7	13.8	*16.5*	11.7		*nc*	1948.7	974.3	***66.7***	1948.7	1937	*0.6*
	2,4-dimethylphenol	mg/kg	0.5																				
	2-methylphenol	mg/kg	0.5																				
	2-nitrophenol	mg/kg	0.5																				
	3-&4-methylphenol	mg/kg	1																				
	3-Methylphenol	mg/kg	0.01																				
	4-chloro-3-methylphenol	mg/kg	0.0005																				
	4-methylphenol	mg/kg	0.01																				
	4-nitrophenol	mg/kg	0.01																				
	Acenaphthene	mg/kg	0.5	<0.5	*nc*	10	6.2	*46.9*	10	11	*9.5*	0.8	1	*22.2*	0.8	<0.5	*nc*	27.7	14.3	***63.8***	27.7	13	***72.2***
	Acenaphthylene	mg/kg	0.5	<0.5	*nc*	65.3	33.2	***65.2***	65.3	50	*26.5*	1	1.1	*9.5*	1	<0.5	*nc*	220	115	***62.7***	220	110	***66.7***
	Anthracene	mg/kg	0.5	<0.5	*nc*	50.3	32.3	*43.6*	50.3	52	*3.3*	2.2	2.5	*12.8*	2.2	<0.5	*nc*	158	78.8	***66.9***	158	84	***61.2***
	Benz(a)anthracene	mg/kg	0.5	<0.5	*nc*	39.8	25.5	*43.8*	39.8	43	*7.7*	7.4	8.2	*10.3*	7.4	1.2	***144.2***	93.3	53.9	***53.5***	93.3	61	*41.9*
	Benzo(a) pyrene	mg/kg	0.5	<0.5	*nc*	24.2	15.8	*42.0*	24.2	33	*30.8*	8	9.3	*15.0*	8	1.3	***144.1***	69.6	36.6	***62.1***	69.6	55	*23.4*
	Benzo(b)&(k)fluoranthene	mg/kg	1	<1	*nc*					46						2	*nc*					77	*nc*
	Benzo(b)fluoranthene	mg/kg	0.5		*nc*	24.5	15	*48.1*	24.5		*nc*	9.5	10.5	*10.0*	9.5			65.2	34.7	***61.1***	65.2		*nc*
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	*nc*	9.5	6.1	*43.6*	9.5	15	*44.9*	3.2	3.4	*6.1*	3.2	0.8	***120.0***	30.4	15.8	***63.2***	30.4	23	*27.7*
	Benzo(k)fluoranthene	mg/kg	0.5		*nc*	12.2	4.6	***90.5***	12.2		*nc*	2.7	3.1	*13.8*	2.7			23	17	*30.0*	23		*nc*
	Chrysene	mg/kg	0.5	<0.5	*nc*	28.6	16.8	***52.0***	28.6	31	*8.1*	7.1	8.1	*13.2*	7.1	1.1	***146.3***	73.8	40.4	***58.5***	73.8	48	*42.4*
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	*nc*	<4	<4	*nc*	<4	3.9	*nc*	0.9	0.9	*0.0*	0.9	<0.5	*nc*	7.4	<4	*nc*	7.4	2.4	***102.0***
	Fluoranthene	mg/kg	0.5	<0.5	*nc*	94.8	61.2	*43.1*	94.8	110	*14.8*	14.5	16.3	*11.7*	14.5	3	***131.4***	278	145	***62.9***	278	160	***53.9***
	Fluorene	mg/kg	0.5	<0.5	*nc*	58	30.3	***62.7***	58	62	*6.7*	1	1.2	*18.2*	1	<0.5	*nc*	169	89.2	***61.8***	169	120	*33.9*
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	*nc*	8.4	5.2	*47.1*	8.4	14	***50.0***	3	3.2	*6.5*	3	0.6	***133.3***	24.8	12.8	***63.8***	24.8	19	*26.5*
	Naphthalene	mg/kg	0.5	<0.5	*nc*	401	236	***51.8***	401	440	*9.3*	<0.5	<0.6	*nc*	<0.5	<0.5	*nc*	957	457	***70.7***	957	1300	*30.4*
	PAHs (Sum of total)	mg/kg	1	<1	*nc*					1200	*nc*					14	*nc*					2500	*nc*
	Phenanthrene	mg/kg	0.5	<0.5	*nc*	153	89.6	***52.3***	153	160	*4.5*	6.2	7.4	*17.6*	6.2	1.4	***126.3***	417	220	***61.9***	417	310	*29.4*
	Phenol	mg/kg	0.5																				
	Pyrene	mg/kg	0.5	<0.5	*nc*	80.4	48.9	*48.7*	80.4	83	*3.2*	14.8	17	*13.8*	14.8	3	***132.6***	251	131	***62.8***	251	140	***56.8***
SVOCs	Dibenzofuran	mg/kg	0.5																				
	Hexachlorophene	mg/kg	0.01																				
TPH	TPH C15-C36	mg/kg				3490	2660	*27.0*	3490		*nc*	1550	1910	*20.8*	1550		*nc*	6330	6400	*1.1*	6330	4600	*31.7*
	TPH C10 - C14	mg/kg	50	<50	*nc*	1340	850	*44.7*	1340	940	*35.1*	<50	70	*nc*	<50	<50	*nc*	3060	2350	*26.2*	3060	2000	*41.9*
	TPH C15-C28	mg/kg	100	<100	*nc*	2720	2020	*29.5*	2720	2500	*8.4*	800	1010	*23.2*	800	<100	*nc*	4860	4900	*0.8*	4860	3600	*29.8*
	TPH C29-C36	mg/kg	100	<100	*nc*	770	640	*18.4*	770	960	*22.0*	750	900	*18.2*	750	<100	*nc*	1470	1500	*2.0*	1470	1000	*38.1*
	TPH C6 - C9	mg/kg	10	<10	*nc*	190	505	***90.6***	190	73	***89.0***	<10	<10	*nc*	<10	<10	*nc*	470	221	***72.1***	470	310	*41.0*
	TPH+C10 - C36 (Sum of total)	mg/kg	50	<100	*nc*	4830	3510	*31.7*	4830	4400	*9.3*	1550	1980	*24.4*	1550	<100	*nc*	9390	8750	*7.1*	9390	6600	*34.9*
	TPH C10 - C40 (Sum of total)	mg/kg	50									1750	2260	*25.4*	1750		*nc*						
	TPH C6-C10	mg/kg	10																				

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Appendix F
Table 1
Soil QA/QC - Field Duplicates

Sample_Depth_Range	17-17.5	17-17.5		18-18.1	18-18.1		19-19.3	19-19.3		19-19.3	19-19.3	
Field_ID	BH410_17.0-17.5	QC639		BH411_18.0-18.1	QC632		BH412_19.0-19.3	QC627		BH412_19.0-19.3	QC628	
Matrix_Type	SOIL	SOIL		SOIL	SOIL		SOIL	SOIL		SOIL	SOIL	
Sample_Type	Normal	Normal	*RPD*	Normal	Field_D	*RPD*	Normal	Field_D	*RPD*	Normal	Interlab_D	*RPD*
SDG	ES1110516	ES1110516		ES1108140	ES1108140		ES1107519	ES1107519		ES1107519	296313	
Monitoring_Zone	Public Domain Blocks 4&5	Public Domain Blocks 4&5		Public Domain Blocks 4&5	Public Domain Blocks 4&5		L	L		L	L	
Location_Code	BH410	BH410		BH411	BH411		BH412	BH412		BH412	BH412	
Sampled_Date_Time	11/05/2011	11/05/2011	%	12/04/2011	13/04/2011	%	7/04/2011	7/04/2011	%	7/04/2011	6/04/2011	%

Chem_Group	ChemName	output unit	EQL												
	CPAH (ESDAT)	mg/kg					32.9	34.7	*5.3*	<4	<4	*nc*	<4		*nc*
BTEX	Total Xylene (ESDAT)	mg/kg	0.15	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.15	*nc*
	Benzene	mg/kg	0.2	<0.2	<0.2	*nc*	<0.2	<0.2	*nc*	<0.2	<0.2	*nc*	<0.2	<0.5	*nc*
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Toluene	mg/kg	0.5	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<1	*nc*
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
Halogenated Phenols	2,3,4,6-tetrachlorophenol	mg/kg	10,000												
	2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2-chlorophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	Pentachlorophenol	mg/kg	2	<2	<2	*nc*									
Other	Cyanide Total	mg/kg	1	2	1	***66.7***									
	pH (Final)	pH	0.1	8.5	8	*6.1*									
	pH (Initial)	pH_Units	0.1												
	Moisture	PERCENT_WW	1	25.2	24.3	*3.6*	34.6	33.1	*4.4*	23.2	24	*3.4*	23.2		*nc*
	Moisture Content (dried @ 103°C)	%	0.1											23	*nc*
	pH (after HCL)	pH	0.1												
Lead	Lead	mg/kg	2	419	384	*8.7*	366	333	*9.4*	19	18	*5.4*	19	7.5	***86.8***
Metals	Arsenic	mg/kg	1	12	17	*34.5*	24	13	***59.5***	<5	<5	*nc*	<5	1.4	*nc*
	Cadmium	mg/kg	0.1	<1	<1	*nc*	<1	<1	*nc*	<1	<1	*nc*	<1	<0.1	*nc*
	Chromium	mg/kg	1	19	25	*27.3*	40	27	*38.8*	17	16	*6.1*	17	11	*42.9*
	Copper	mg/kg	2	48	64	*28.6*	118	77	*42.1*	8	6	*28.6*	8	6.9	*14.8*
	Mercury	mg/kg	0.05	1.1	1.8	*48.3*	3.4	1.6	***72.0***	<0.1	<0.1	*nc*	<0.1	<0.05	*nc*
	Nickel	mg/kg	1	10	10	*0.0*	12	9	*28.6*	2	3	*40.0*	2	1.1	***58.1***
	Zinc	mg/kg	5	362	407	*11.7*	446	316	*34.1*	<5	6	*nc*	<5	<5	*nc*
Other	Polycylic aromatic hydrocarbons EPA448	mg/kg	0.5	142	143	*0.7*									
	TCLP Fluid	-	1												
	Total BTEX	mg/kg	1											<1	*nc*
PAH/Phenols	PAH (ESDAT TOTAL)	mg/kg					82.6	84.1	*1.8*	<8	<8	*nc*	<8		*nc*
	PAH (total, NSW Waste 2008)	mg/kg					82.6	84.1	*1.8*	<8	<8	*nc*	<8		*nc*
	Sum of 10 PAHs	mg/kg					67.6	69.4	*2.6*	<5	<5	*nc*	<5		*nc*
	Sum of 5 PAHs	mg/kg					15	14.7	*2.0*	<3	<3	*nc*	<3		*nc*
	2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2-methylphenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	2-nitrophenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	3-&4-methylphenol	mg/kg	1	<1	<1	*nc*									
	3-Methylphenol	mg/kg	0.01												
	4-chloro-3-methylphenol	mg/kg	0.0005	<0.5	<0.5	*nc*									
	4-methylphenol	mg/kg	0.01												
	4-nitrophenol	mg/kg	0.01												
	Acenaphthene	mg/kg	0.5	4.1	4.5	*9.3*	0.5	0.5	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Acenaphthylene	mg/kg	0.5	5.2	5	*3.9*	3.4	3.3	*3.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Anthracene	mg/kg	0.5	9.7	8.5	*13.2*	3.3	3.2	*3.1*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Benz(a)anthracene	mg/kg	0.5	9.6	9.9	*3.1*	7.3	7.5	*2.7*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Benzo(a) pyrene	mg/kg	0.5	7.7	8	*3.8*	6.8	6.8	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Benzo(b)&(k)fluoranthene	mg/kg	1											<1	*nc*
	Benzo(b)fluoranthene	mg/kg	0.5	8.9	9.1	*2.2*	5.9	6.5	*9.7*	<0.5	<0.5	*nc*	<0.5		*nc*
	Benzo(g,h,i)perylene	mg/kg	0.5	3.9	4	*2.5*	2.7	2.7	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Benzo(k)fluoranthene	mg/kg	0.5	4.5	4.9	*8.5*	1.9	3	*44.9*	<0.5	<0.5	*nc*	<0.5		*nc*
	Chrysene	mg/kg	0.5	7.9	8.2	*3.7*	5.6	5.5	*1.8*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Dibenz(a,h)anthracene	mg/kg	0.5	0.8	0.7	*13.3*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Fluoranthene	mg/kg	0.5	23	23.6	*2.6*	17	17	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Fluorene	mg/kg	0.5	4.8	4.9	*2.1*	1.2	1.2	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	3.3	3.4	*3.0*	2.2	2.2	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Naphthalene	mg/kg	0.5	2.8	2.6	*7.4*	1.2	1.1	*8.7*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	PAHs (Sum of total)	mg/kg	1											<1	*nc*
	Phenanthrene	mg/kg	0.5	24.4	24.5	*0.4*	5.4	5.4	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
	Phenol	mg/kg	0.5	<0.5	<0.5	*nc*									
	Pyrene	mg/kg	0.5	21.3	21	*1.4*	17.7	17.7	*0.0*	<0.5	<0.5	*nc*	<0.5	<0.5	*nc*
SVOCs	Dibenzofuran	mg/kg	0.5	0.5	4.4	***159.2***									
	Hexachlorophene	mg/kg	0.01												
TPH	TPH C15-C36	mg/kg					1950	1890	*3.1*	<200	<200	*nc*	<200		*nc*
	TPH C10 - C14	mg/kg	50	<50	<50	*nc*	<50	<50	*nc*	<50	<50	*nc*	<50	<50	*nc*
	TPH C15-C28	mg/kg	100	1160	1280	*9.8*	1130	1130	*0.0*	<100	<100	*nc*	<100	<100	*nc*
	TPH C29-C36	mg/kg	100	660	710	*7.3*	820	760	*7.6*	<100	<100	*nc*	<100	<100	*nc*
	TPH C6 - C9	mg/kg	10	<10	<10	*nc*	<10	<10	*nc*	<10	<10	*nc*	<10	<10	*nc*
	TPH+C10 - C36 (Sum of total)	mg/kg	50	1820	1990	*8.9*	1950	1890	*3.1*	<50	<50	*nc*	<50	<100	*nc*
	TPH C10 - C40 (Sum of total)	mg/kg	50	2080	2310	*10.5*									
	TPH C6-C10	mg/kg	10	<10	<10	*nc*									

Field_ID	IT04M	QC644		IT04M	QC645		IT05D	QC643		MW198	QC618		MW198 FILTRATE	QC618 FILTRATE		MW401	QC615	
x_coord										333731.302	333731.302		333731.302	333731.302		333666.65	333666.65	
y_coord										6251717.625	6251717.625		6251717.625	6251717.625		6251757.5	6251757.5	
Monitoring_Round																		
Sample_Type	Normal	Field_D	*RPD*	Normal	Interlab_D	*RPD*	Normal	Field_D	*RPD*	Normal	Field_D	*RPD*	Normal	Field_D	*RPD*	Normal	Field_D	*RPD*
Sampled_Date_Time	19/05/2011	19/05/2011		19/05/2011	19/05/2011		19/05/2011	19/05/2011		25/02/2011	25/02/2011		25/02/2011	25/02/2011		24/02/2011	24/02/2011	
Monitoring_Zone										VMP & PDA - Block 5	VMP & PDA - Block 5		VMP & PDA - Block 5	VMP & PDA - Block 5		Block 5	Block 5	
Location_Code	IT04M	IT04M		IT04M	IT04M		IT05D	IT05D		BH198	BH198		BH198	BH198		BH401	BH401	
SDG	ES1110580	ES1110580		ES1110580	300143		ES1110580	ES1110580		ES1104161	ES1104161		ES1104161	ES1104161		ES1104161	ES1104161	
SampleComments			%			%			%			%			%			%

Chem_Group	ChemName	output unit	EQL																
	>C10 - C16 Fraction	mg/L	0.1																
	>C10 - C40 Fraction (sum)	µg/L	100																
	>C16 - C34 Fraction	mg/L	0.1																
	>C34 - C40 Fraction	mg/L	0.1																
	Sum of BTEX	mg/L	0.001																
	C6 - C10 Fraction	mg/L	0.02																
	C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02																
	CPAH (ESDAT)	µg/L		<0.75	0.77	*nc*	<0.75	22.5	*nc*	<0.75	<0.75	*nc*	<7.5	<7.5	*nc*	<0.75	<0.75	*nc*	<39.2	<80	*nc*
BTEX	Total Xylene (ESDAT)	µg/L	2	<2	<2	*nc*	<2		*nc*	17	18	*5.7*	<4	<4	*nc*				42	44	*4.7*
	Benzene	µg/L	1	<1	<1	*nc*	<1		*nc*	34	32	*6.1*	<1	<1	*nc*				127	138	*8.3*
	Ethylbenzene	µg/L	1	<2	<2	*nc*	<2		*nc*	<2	<2	*nc*	<2	<2	*nc*				<5	<5	*nc*
	Toluene	µg/L	1	<5	<5	*nc*	<5		*nc*	8	8	*0.0*	<5	<5	*nc*				108	112	*3.6*
	Xylene (m & p)	µg/L	2	<2	<2	*nc*	<2		*nc*	12	13	*8.0*	<2	<2	*nc*				27	30	*10.5*
	Xylene (o)	µg/L	1	<2	<2	*nc*	<2		*nc*	5	5	*0.0*	<2	<2	*nc*				15	14	*6.9*
Cyanides	Cyanide (WAD)	mg/L	0.01																		
Halogenated Phenols	2,3,4,6-tetrachlorophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.2	<0.2	*nc*			
	2,4,5-trichlorophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.2	<0.2	*nc*	<4.9	<10	*nc*
	2,4,6-trichlorophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.2	<0.2	*nc*	<4.9	<10	*nc*
	2,4-dichlorophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.2	<0.2	*nc*	<4.9	<10	*nc*
	2,6-dichlorophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.2	<0.2	*nc*	<4.9	<10	*nc*
	2-chlorophenol	µg/L	0.05	<0.05	<0.05	*nc*	<0.05	<2	*nc*	<0.05	<0.05	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Pentachlorophenol	µg/L	0.05	<0.05	<0.05	*nc*	<0.05	<10	*nc*	<0.05	<0.05	*nc*	<2	<2	*nc*	<0.1	<0.1	*nc*	<9.8	<20	*nc*
	tetrachlorophenols	µg/L	30																		
Herbicides	Dinoseb	µg/L	100																		
Inorganics	Ammonia as N	mg/L	0.01																		
	Cyanide (Free)	mg/L	0.004	<0.004	<0.004	*nc*	<0.004		*nc*	<0.004	<0.004	*nc*	<0.004	<0.004	*nc*				<0.004	<0.004	*nc*
	Weak Acid Dissociable Cyanide	mg/L	0.004	0.006	0.005	*nc*	0.006		*nc*	<0.004	<0.004	*nc*	<0.004	<0.004	*nc*				<0.004	<0.004	*nc*
Lead	Lead	µg/L	1																		
	Lead (Filtered)	µg/L	0.1	<0.2	0.3	*nc*	<0.2	<1	*nc*	8	8.5	*6.1*	<0.1	<0.1	*nc*				0.2	<0.2	*nc*
MAH	Styrene	µg/L	5																		
Metals	Aluminium (Filtered)	mg/L	0.005	<0.01	0.02	*nc*	<0.01	<0.01	*nc*	9.09	9.14	*0.5*	0.021	0.02	*4.9*				<0.01	<0.01	*nc*
	Antimony (Filtered)	mg/L	0.0002	<0.0005	<0.0005	*nc*	<0.0005	<0.005	*nc*	<0.0005	<0.0005	*nc*	<0.0002	<0.0002	*nc*				<0.0005	<0.0005	*nc*
	Arsenic	µg/L	1																		
	Arsenic (Filtered)	µg/L	0.2	1.5	1	*40.0*	1.5	18	***169.2***	14.7	16.1	*9.1*	3.8	3.7	*2.7*				2.8	3.1	*10.2*
	Barium (Filtered)	mg/L	0.0005	0.111	0.117	*5.3*	0.111	0.1	*10.4*	0.037	0.037	*0.0*	0.0525	0.0517	*1.5*				5.25	5.27	*0.4*
	Beryllium (Filtered)	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<1	*nc*	13.9	14.1	*1.4*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*
	Cadmium	µg/L	0.1																		
	Cadmium (Filtered)	µg/L	0.05	<0.2	<0.2	*nc*	<0.2	<0.1	*nc*	0.7	1.1	*44.4*	1	1.66	*49.6*				1.6	0.5	***104.8***
	Chromium	µg/L	1																		
	Chromium (Filtered)	µg/L	0.2	<0.5	<0.5	*nc*	<0.5	17	*nc*	<0.5	<0.5	*nc*	1.1	1.1	*0.0*				<0.5	<0.5	*nc*
	Chromium (hexavalent) (Filtered)	mg/L	0.01																		
	Chromium (Trivalent) (Filtered)	mg/L	0.01																		
	Cobalt (Filtered)	µg/L	0.1	0.7	0.7	*0.0*	0.7	2	***96.3***	145	142	*2.1*	0.6	0.6	*0.0*				1.6	1.4	*13.3*
	Copper	µg/L	1																		
	Copper (Filtered)	µg/L	0.5	<1	11	*nc*	<1	10	*nc*	<1	<1	*nc*	<0.5	<0.5	*nc*				<1	<1	*nc*
	Manganese (Filtered)	mg/L	0.0005	0.182	0.187	*2.7*	0.182	0.18	*1.1*	7.38	7.23	*2.1*	0.103	0.102	*1.0*				0.406	0.394	*3.0*
	Mercury	µg/L	0.1																		
	Mercury (Filtered)	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*
	Nickel	µg/L	1																		
	Nickel (Filtered)	µg/L	0.5	1	1.8	***57.1***	1	35	***188.9***	171	169	*1.2*	69.1	64.6	*6.7*				66.4	64.2	*3.4*
	Selenium (Filtered)	mg/L	0.0002	<0.002	<0.002	*nc*	<0.002	<0.005	*nc*	0.005	0.004	*22.2*	<0.0002	<0.0002	*nc*				<0.002	<0.002	*nc*
	Silver (Filtered)	mg/L	0.0001	0.0001	<0.0001	*nc*	0.0001	<0.0001	*nc*	0.0002	<0.0001	*nc*	<0.0001	<0.0001	*nc*				<0.0001	<0.0001	*nc*
	Vanadium (Filtered)	µg/L	0.2	0.8	1	*22.2*	0.8	10	***170.4***	2	1.8	*10.5*	0.7	0.7	*0.0*				0.5	0.6	*18.2*
	Zinc	mg/L	0.005																		
	Zinc (Filtered)	mg/L	0.001	<0.005	0.005	*nc*	<0.005	0.011	*nc*	0.456	0.461	*1.1*	0.008	0.008	*0.0*				0.016	0.011	*37.0*
other	Scheduled chemicals (NSW Waste 2008)	mg/L		<0.00025	<0.00025	*nc*	<0.00025	<0.01	*nc*	<0.00025	<0.00025	*nc*	<0.002	<0.002	*nc*	<0.0005	<0.0005	*nc*	<0.0098	<0.02	*nc*
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5																		
	Total BTEX	mg/L	0.01																		
PAH	7,12-dimethylbenz(a)anthracene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
PAH/Phenols	PAH (ESDAT TOTAL)	µg/L		2.65	4.07	*42.3*	2.65	56.5	***182.1***	81.65	65.25	*22.3*	15.9	16.9	*6.1*	2.45	2.35	*4.2*	298.2	343	*14.0*
	PAH (total, NSW Waste 2008)	mg/L		0.00265	0.00407	*42.3*	0.00265	0.0565	***182.1***	0.08165	0.06525	*22.3*	0.0159	0.0169	*6.1*	0.00245	0.00235	*4.2*	0.2982	0.343	*14.0*
	Sum of 10 PAHs	mg/L		0.00145	0.00187	*25.3*	0.00145	0.0447	***187.4***	<0.00095	<0.00095	*nc*	<0.0095	<0.0095	*nc*	<0.00095	<0.00095	*nc*	0.0493	<0.1	*nc*
	Sum of 5 PAHs	mg/L		0.0012	0.0022	***58.8***	0.0012	0.0118	***163.1***	0.0807	0.0643	*22.6*	0.0064	0.0074	*14.5*	0.0015	0.0014	*6.9*	0.2489	0.243	*2.4*
	2,4-dimethylphenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	12.8	10.3	*21.6*	<1	<1	*nc*	<0.2	<0.2	*nc*	108	95.3	*12.5*
	2,4-dinitrophenol	mg/L	0.03																		
	2-methylnaphthalene	µg/L	0.1	<0.1	0.1	*nc*	<0.1		*nc*	1.3	1	*26.1*				<0.1	<0.1	*nc*			
	2-methylphenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	2.1	2	*4.9*	<1	<1	*nc*	<0.2	<0.2	*nc*	63.4	58.2	*8.6*
	2-nitrophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.2	<0.2	*nc*	<4.9	<10	*nc*
	3-&4-methylphenol	µg/L	2					<4	*nc*				<2	<2	*nc*				111	111	*0.0*
	3-methylcholanthrene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
	3-Methylphenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.2	0.2	*nc*			
	4,6-Dinitro-2-methylphenol	µg/L	30																		
	4-chloro-3-methylphenol	µg/L	0.05	<0.05	<0.05	*nc*	<0.05	<2	*nc*	<0.05	<0.05	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	4-methylphenol	mg/L	0.0001	<0.0001	<0.0001	*nc*	<0.0001		*nc*	<0.0001	<0.0001	*nc*				<0.0002	<0.0002	*nc*			
	4-nitrophenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.2	<0.2	*nc*			
	Acenaphthene	µg/L	0.01	0.2	0.3	*40.0*	0.2	0.3	*40.0*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	10.5	10.5	*0.0*
	Acenaphthylene	µg/L	0.01	<0.1	0.1	*nc*	<0.1	4.3	*nc*	0.1	0.2	***66.7***	1.4	2.4	*52.6*	0.4	0.4	*0.0*	12.8	12.1	*5.6*
	Anthracene	µg/L	0.01	0.1	0.2	***66.7***	0.1	1.8	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Benz(a)anthracene	µg/L	0.01	<0.1	<0.1	*nc*	<0.1	6	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Benzo(a) pyrene	µg/L	0.01	<0.05	0.07	*nc*	<0.05	5.3	*nc*	<0.05	<0.05	*nc*	<0.5	<0.5	*nc*	<0.05	<0.05	*nc*	<4.9	<10	*nc*

Field_ID	IT04M	QC644		IT04M	QC645		IT05D	QC643		MW198	QC618		MW198 FILTRATE	QC618 FILTRATE		MW401	QC615	
x_coord										333731.302	333731.302		333731.302	333731.302		333666.65	333666.65	
y_coord										6251717.625	6251717.625		6251717.625	6251717.625		6251757.5	6251757.5	
Monitoring_Round																		
Sample_Type	Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD	Normal	Field_D	RPD
Sampled_Date_Time	19/05/2011	19/05/2011		19/05/2011	19/05/2011		19/05/2011	19/05/2011		25/02/2011	25/02/2011		25/02/2011	25/02/2011		24/02/2011	24/02/2011	
Monitoring_Zone										VMP & PDA - Block 5	VMP & PDA - Block 5		VMP & PDA - Block 5	VMP & PDA - Block 5		Block 5	Block 5	
Location_Code	IT04M	IT04M		IT04M	IT04M		IT05D	IT05D		BH198	BH198		BH198	BH198		BH401	BH401	
SDG	ES1110580	ES1110580		ES1110580	300143		ES1110580	ES1110580		ES1104161	ES1104161		ES1104161	ES1104161		ES1104161	ES1104161	
SampleComments			%			%			%			%			%			%

Chem_Group	ChemName	output unit	EQL																	
	Benzo(b)&(k)fluoranthene	µg/L	0.05					9.8	*nc*											
	Benzo(b)fluoranthene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Benzo(g,h,i)perylene	µg/L	0.01	<0.1	<0.1	*nc*	<0.1	2.9	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Chrysene	µg/L	0.01	<0.1	<0.1	*nc*	<0.1	4.4	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Dibenz(a,h)anthracene	µg/L	0.01	<0.1	<0.1	*nc*	<0.1	1.2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Fluoranthene	µg/L	0.01	0.3	0.5	***50.0***	0.3	9.2	***187.4***	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Fluorene	µg/L	0.01	0.1	0.3	***100.0***	0.1	0.5	***133.3***	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	9.4	11.4	*19.2*
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01	<0.1	<0.1	*nc*	<0.1	2.7	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	<4.9	<10	*nc*
	Naphthalene	µg/L	0.01	<5	<5	*nc*	<5	0.8	*nc*	64	60	*6.5*	<1	<1	*nc*	0.7	0.6	*15.4*	195	184	*5.8*
	PAHs (Sum of total)	µg/L	0.05					66													
	Phenanthrene	µg/L	0.01	0.5	0.9	***57.1***	0.5	4.1	***156.5***	<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	16.3	15	*8.3*
	Phenol	µg/L	0.1	<0.1	<0.1	*nc*	<0.1	<2	*nc*	<0.1	<0.1	*nc*	<1	<1	*nc*	0.3	0.5	***50.0***	15	15.4	*2.6*
	Pyrene	µg/L	0.01	0.4	0.6	*40.0*	0.4	13		<0.1	<0.1	*nc*	<1	<1	*nc*	<0.1	<0.1	*nc*	5.2	<10	*nc*
Pesticides	Pesticides (total, NSW Waste 2008)	mg/L		<0.00005	<0.00005	*nc*	<0.00005	<0.002	*nc*	<0.00005	<0.00005	*nc*	<0.001	<0.001	*nc*	<0.0001	<0.0001	*nc*	<0.0049	<0.01	*nc*
Phenolics	4,6-Dinitro-o-cyclohexyl phenol	µg/L	100																		
	Phenols (Total Halogenated)	mg/L	0.01																		
	Phenols (Total Non Halogenated)	mg/L	0.1																		
SVOCs	2-(acetylamino) fluorene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
	Benzo(e)pyrene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
	Coronene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
	Dibenzofuran	µg/L	2																		
	Hexachlorophene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.2	<0.2	*nc*			
	Perylene	µg/L	0.1	<0.1	<0.1	*nc*	<0.1		*nc*	<0.1	<0.1	*nc*				<0.1	<0.1	*nc*			
TPH	TPH C15-C36	mg/L		<0.15	<0.15	*nc*	<0.15		*nc*	<0.15	<0.15	*nc*	<0.15	<0.15	*nc*				1.12	1.1	*1.8*
	TPH C10 - C14	µg/L	50	<50	<50	*nc*	<50		*nc*	120	120	*0.0*	<50	<50	*nc*				790	800	*1.3*
	TPH C15-C28	µg/L	100	<100	<100	*nc*	<100		*nc*	<100	<100	*nc*	<100	<100	*nc*				1070	1050	*1.9*
	TPH C29-C36	µg/L	50	<50	<50	*nc*	<50		*nc*	<50	<50	*nc*	<50	<50	*nc*				<50	<50	*nc*
	TPH C6 - C9	µg/L	20	<20	<20	*nc*	<20		*nc*	90	90	*0.0*	<20	<20	*nc*				350	400	*13.3*
	TPH+C10 - C36 (Sum of total)	µg/L	50	<50	<50	*nc*	<50		*nc*	120	120	*0.0*	<50	<50	*nc*				1860	1850	*0.5*
	TPH C10 - C40 (Sum of total)	µg/L	100	<100	<100	*nc*	<100		*nc*	100	100	*0.0*									
	TPH C6-C10	mg/L	0.02	<0.02	<0.02	*nc*	<0.02		*nc*	0.09	0.1	*10.5*									

Field_ID	MW401	QC616		MW401 FILTRATE	QC615 FILTRATE		Flitrate Blank	QC608	QC612	QC617	QC619	QC620	QC621	QC624	QC625	QC626	QC629	QC630	QC633	QC635	QC636
x_coord	333666.65	333666.65		333666.65	333666.65																
y_coord	6251757.5	6251757.5		6251757.5	6251757.5																
Monitoring_Round																					
Sample_Type	Normal	Interlab_D	*RPD*	Normal	Field_D	*RPD*	Normal	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate
Sampled_Date_Time	24/02/2011	24/02/2011		24/02/2011	24/02/2011		19/05/2011	10/02/2011	15/02/2011	24/02/2011	25/02/2011	28/02/2011	1/04/2011	5/04/2011	6/04/2011	7/04/2011	8/04/2011	12/04/2011	13/04/2011	14/04/2011	19/04/2011
Monitoring_Zone	Block 5	Block 5		Block 5	Block 5																
Location_Code	BH401	BH401		BH401	BH401		Flitrate Blank														
SDG	ES1104161	292248		ES1104161	ES1104161		ES1110584	ES1103042	ES1103336	ES1104095	ES1104220	ES1104220	ES1107354	ES1107354	ES1107519	ES1107519	ES1107519	ES1108140	ES1108140	ES1108140	ES1108478
SampleComments			%			%	Flltrate														

Chem_Group	ChemName	output unit	EQL																				
	>C10 - C16 Fraction	mg/L	0.1												<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	>C10 - C40 Fraction (sum)	µg/L	100														<100	<100	<100	<100	<100	<100	<100
	>C16 - C34 Fraction	mg/L	0.1												0.17	0.17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	>C34 - C40 Fraction	mg/L	0.1												<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Sum of BTEX	mg/L	0.001												<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	C6 - C10 Fraction	mg/L	0.02												<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02												<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	CPAH (ESDAT)	µg/L		<39.2	<6	*nc*	<0.75	<0.75	*nc*	<0.75													
BTEX	Total Xylene (ESDAT)	µg/L	2	42	46	*9.1*				<2					<2	<2	<2	<2	<2	<2	<2	<2	<2
	Benzene	µg/L	1	127	140	*9.7*				<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Ethylbenzene	µg/L	1	<5	4	*nc*				4	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Toluene	µg/L	1	108	120	*10.5*				<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
	Xylene (m & p)	µg/L	2	27	31	*13.8*				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Xylene (o)	µg/L	1	15	15	*0.0*				<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Cyanides	Cyanide (WAD)	mg/L	0.01		0.01	*nc*																	
Halogenated Phenols	2,3,4,6-tetrachlorophenol	µg/L	0.1				<0.2	<0.2	*nc*	<0.1													
	2,4,5-trichlorophenol	µg/L	0.1	<4.9	<10	*nc*	<0.2	<0.2	*nc*	<0.1			<1	<1	<1								<1
	2,4,6-trichlorophenol	µg/L	0.1	<4.9	<10	*nc*	<0.2	<0.2	*nc*	<0.1			<1	<1	<1								<1
	2,4-dichlorophenol	µg/L	0.1	<4.9	<3	*nc*	<0.2	<0.2	*nc*	<0.1			<1	<1	<1								<1
	2,6-dichlorophenol	µg/L	0.1	<4.9	<3	*nc*	<0.2	<0.2	*nc*	<0.1			<1	<1	<1								<1
	2-chlorophenol	µg/L	0.05	<4.9	<3	*nc*	<0.1	<0.1	*nc*	<0.05			<1	<1	<1								<1
	Pentachlorophenol	µg/L	0.05	<9.8	<10	*nc*	<0.1	<0.1	*nc*	<0.05			<2	<2	<2								<2
	tetrachlorophenols	µg/L	30		<30	*nc*																	
Herbicides	Dinoseb	µg/L	100		<100	*nc*																	
Inorganics	Ammonia as N	mg/L	0.01							<0.01													
	Cyanide (Free)	mg/L	0.004	<0.004	0.007	*nc*				<0.004													
	Weak Acid Dissociable Cyanide	mg/L	0.004	<0.004		*nc*				<0.004													
Lead	Lead	µg/L	1																				
	Lead (Filtered)	µg/L	0.1	0.2	<1	*nc*				<0.1	<1	<1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<0.1
MAH	Styrene	µg/L	5							7													
Metals	Aluminium (Filtered)	mg/L	0.005	<0.01	<0.05	*nc*							<0.005	<0.005	0.006								<0.005
	Antimony (Filtered)	mg/L	0.0002	<0.0005	<0.005	*nc*							<0.0002	<0.0002	<0.0002								<0.0002
	Arsenic	µg/L	1																				
	Arsenic (Filtered)	µg/L	0.2	2.8	3	*6.9*				<0.2	<1	<1	<0.2	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<1	<0.2
	Barium (Filtered)	mg/L	0.0005	5.25	5.4	*2.8*							<0.0005	<0.0005	<0.0005								<0.0005
	Beryllium (Filtered)	µg/L	0.1	<0.1	<1	*nc*							<0.1	<0.1	<0.1								<0.1
	Cadmium	µg/L	0.1																				
	Cadmium (Filtered)	µg/L	0.05	1.6	0.7	***78.3***				<0.05	<0.1	<0.1	<0.05	0.25	1.26	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.05
	Chromium	µg/L	1																				
	Chromium (Filtered)	µg/L	0.2	<0.5	<1	*nc*				<0.2	<1	<1	<0.2	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<1	<0.2
	Chromium (hexavalent) (Filtered)	mg/L	0.01							<0.01													
	Chromium (Trivalent) (Filtered)	mg/L	0.01							<0.01													
	Cobalt (Filtered)	µg/L	0.1	1.6	1	*46.2*				<0.1			<0.1	<0.1	<0.1								<0.1
	Copper	µg/L	1																				
	Copper (Filtered)	µg/L	0.5	<1	<1	*nc*				<0.5	<1	<1	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5
	Manganese (Filtered)	mg/L	0.0005	0.406	0.31	*26.8*							<0.0005	<0.0005	<0.0005								<0.0005
	Mercury	µg/L	0.1																				
	Mercury (Filtered)	µg/L	0.1	<0.1	<0.1	*nc*				<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Nickel	µg/L	1																				
	Nickel (Filtered)	µg/L	0.5	66.4	47	*34.2*				<0.5	7	<1	<0.5	<0.5	<0.5	<1	<1	<1	<1	<1	<1	<1	<0.5
	Selenium (Filtered)	mg/L	0.0002	<0.002	0.003	*nc*							<0.0002	<0.0002	<0.0002								<0.0002
	Silver (Filtered)	mg/L	0.0001	<0.0001	<0.005	*nc*							<0.0001	<0.0001	<0.0001								<0.0001
	Vanadium (Filtered)	µg/L	0.2	0.5	<5	*nc*				<0.2			<0.2	<0.2	<0.2								<0.2
	Zinc	mg/L	0.005																				
	Zinc (Filtered)	mg/L	0.001	0.016	0.009	***56.0***				0.002	0.023	<0.005	0.003	<0.001	0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.001
other	Scheduled chemicals (NSW Waste 2008)	mg/L		<0.0098	<0.01	*nc*	<0.0005	<0.0005	*nc*	<0.00025													
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5																				<0.5
	Total BTEX	mg/L	0.01		0.31	*nc*																	
PAH	7,12-dimethylbenz(a)anthracene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
PAH/Phenols	PAH (ESDAT TOTAL)	µg/L		298.2	331	*10.4*	51.15	43.45	*16.3*	<1.55													
	PAH (total, NSW Waste 2008)	mg/L		0.2982	0.331	*10.4*	0.05115	0.04345	*16.3*	<0.00155													
	Sum of 10 PAHs	mg/L		0.0493	0.012	***121.7***	<0.00095	<0.00095	*nc*	<0.00095													
	Sum of 5 PAHs	mg/L		0.2489	0.319	*24.7*	0.0502	0.0425	*16.6*	<0.0006													
	2,4-dimethylphenol	µg/L	0.1	108	180	***50.0***	50	48.4	*3.3*	<0.1			<1	<1	<1								<1
	2,4-dinitrophenol	mg/L	0.03		<0.03	*nc*																	
	2-methylnaphthalene	µg/L	0.1				2.1	2.3	*9.1*	<0.1													
	2-methylphenol	µg/L	0.1	63.4	60	*5.5*	27.8	26.7	*4.0*	<0.1			<1	<1	<1								<1
	2-nitrophenol	µg/L	0.1	<4.9	<10	*nc*	<0.2	<0.2	*nc*	<0.1			<1	<1	<1								<1
	3-&4-methylphenol	µg/L	2	111	160	*36.2*							<2	<2	<2								<2
	3-methylcholanthrene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
	3-Methylphenol	µg/L	0.1				31.1	29.3	*6.0*	<0.1													
	4,6-Dinitro-2-methylphenol	µg/L	30		<30	*nc*																	
	4-chloro-3-methylphenol	µg/L	0.05	<4.9	<10	*nc*	<0.1	<0.1	*nc*	<0.05			<1	<1	<1								<1
	4-methylphenol	mg/L	0.0001				0.0187	0.0179	*4.4*	<0.0001													
	4-nitrophenol	µg/L	0.1		<30	*nc*	<0.2	<0.2	*nc*	<0.1													
	Acenaphthene	µg/L	0.01	10.5	11	*4.7*	1.2	1.4	*15.4*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Acenaphthylene	µg/L	0.01	12.8	10	*24.6*	1	1.2	*18.2*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Anthracene	µg/L	0.01	<4.9	2	*nc*	<0.1	0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benz(a)anthracene	µg/L	0.01	<4.9	<1	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(a) pyrene	µg/L	0.01	<4.9	<1	*nc*	<0.05	<0.05	*nc*	<0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Field_ID	MW401	QC616		MW401 FILTRATE	QC615 FILTRATE		Flitrate Blank	QC608	QC612	QC617	QC619	QC620	QC621	QC624	QC625	QC626	QC629	QC630	QC633	QC635	QC636
x_coord	333666.65	333666.65		333666.65	333666.65																
y_coord	6251757.5	6251757.5		6251757.5	6251757.5																
Monitoring_Round																					
Sample_Type	Normal	Interlab_D	*RPD*	Normal	Field_D	*RPD*	Normal	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate
Sampled_Date_Time	24/02/2011	24/02/2011		24/02/2011	24/02/2011		19/05/2011	10/02/2011	15/02/2011	24/02/2011	25/02/2011	28/02/2011	1/04/2011	5/04/2011	6/04/2011	7/04/2011	8/04/2011	12/04/2011	13/04/2011	14/04/2011	19/04/2011
Monitoring_Zone	Block 5	Block 5		Block 5	Block 5																
Location_Code	BH401	BH401		BH401	BH401		Flitrate Blank														
SDG	ES1104161	292248		ES1104161	ES1104161		ES1110584	ES1103042	ES1103336	ES1104095	ES1104220	ES1104220	ES1107354	ES1107354	ES1107519	ES1107519	ES1107519	ES1108140	ES1108140	ES1108140	ES1108478
SampleComments			%			%	Flltrate														

Chem_Group	ChemName	output unit	EQL																				
	Benzo(b)&(k)fluoranthene	µg/L	0.05		<2	*nc*																	
	Benzo(b)fluoranthene	µg/L	0.1	<4.9		*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(g,h,i)perylene	µg/L	0.01	<4.9	<1	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Benzo(k)fluoranthene	µg/L	0.1	<4.9		*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Chrysene	µg/L	0.01	<4.9	<1	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Dibenz(a,h)anthracene	µg/L	0.01	<4.9	<1	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluoranthene	µg/L	0.01	<4.9	3	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Fluorene	µg/L	0.01	9.4	11	*15.7*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01	<4.9	<1	*nc*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Naphthalene	µg/L	0.01	195	270	*32.3*	47.7	39.6	*18.6*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	PAHs (Sum of total)	µg/L	0.05		330	*nc*																	
	Phenanthrene	µg/L	0.01	16.3	15	*8.3*	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Phenol	µg/L	0.1	15	<50	*nc*	6.6	9.4	*35.0*	<0.1			<1	<1	<1								<1
	Pyrene	µg/L	0.01	5.2	3	***53.7***	<0.1	<0.1	*nc*	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Pesticides	Pesticides (total, NSW Waste 2008)	mg/L		<0.0049	<0.01	*nc*	<0.0001	<0.0001	*nc*	<0.00005													
Phenolics	4,6-Dinitro-o-cyclohexyl phenol	µg/L	100		<100	*nc*																	
	Phenols (Total Halogenated)	mg/L	0.01		<0.01	*nc*																	
	Phenols (Total Non Halogenated)	mg/L	0.1		0.4	*nc*																	
SVOCs	2-(acetylamino) fluorene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
	Benzo(e)pyrene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
	Coronene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
	Dibenzofuran	µg/L	2							<2													
	Hexachlorophene	µg/L	0.1				<0.2	<0.2	*nc*	<0.1													
	Perylene	µg/L	0.1				<0.1	<0.1	*nc*	<0.1													
TPH	TPH C15-C36	mg/L		1.12	1.52	*30.3*				<0.15													
	TPH C10 - C14	µg/L	50	790	1000	*23.5*				<50	<50	<50		<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
	TPH C15-C28	µg/L	100	1070	1300	*19.4*				<100	<100	<100		<100	<100	140	110	<100	<100	<100	<100	<100	<100
	TPH C29-C36	µg/L	50	<50	220	*nc*				<50	<50	<50		<50	<50	90	100	<50	<50	<50	<50	<50	<50
	TPH C6 - C9	µg/L	20	350	330	*5.9*				<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	TPH+C10 - C36 (Sum of total)	µg/L	50	1860	2500	*29.4*				<50	<50	<50		<50	<50	230	210	<50	<50	<50	<50	<50	<50
	TPH C10 - C40 (Sum of total)	µg/L	100							<100						170	170						
	TPH C6-C10	mg/L	0.02							<0.02													

Field_ID	QC637	QC646	QC655	QC662	QC665	TRIP BLANK	TRIP SPIKE
x_coord							
y_coord							
Monitoring_Round							
Sample_Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Trip_B	Trip_S
Sampled_Date_Time	20/04/2011	19/05/2011	8/02/2011	9/02/2011	11/02/2011	23/02/2011	23/02/2011
Monitoring_Zone							
Location_Code							
SDG	ES1108478	ES1110580	ES1102875	ES1102973	ES1103100	ES1104095	ES1104095
SampleComments							

Chem_Group	ChemName	output unit	EQL						
	>C10 - C16 Fraction	mg/L	0.1	<0.1					
	>C10 - C40 Fraction (sum)	µg/L	100	<100					
	>C16 - C34 Fraction	mg/L	0.1	<0.1					
	>C34 - C40 Fraction	mg/L	0.1	<0.1					
	Sum of BTEX	mg/L	0.001	<0.001					
	C6 - C10 Fraction	mg/L	0.02	<0.02					
	C6 - C10 Fraction minus BTEX (F1)	mg/L	0.02	<0.02					
	CPAH (ESDAT)	µg/L							
BTEX	Total Xylene (ESDAT)	µg/L	2	<2	<2				
	Benzene	µg/L	1	<1	<1	<1	<1	<1	18
	Ethylbenzene	µg/L	1	<2	<2	<2	<2	<2	17
	Toluene	µg/L	1	<5	<5	<5	<5	<5	18
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	<2	17
	Xylene (o)	µg/L	1	<2	<2	<2	<2	<2	17
Cyanides	Cyanide (WAD)	mg/L	0.01						
Halogenated Phenols	2,3,4,6-tetrachlorophenol	µg/L	0.1		<0.1				
	2,4,5-trichlorophenol	µg/L	0.1	<1	<0.1				
	2,4,6-trichlorophenol	µg/L	0.1	<1	<0.1				
	2,4-dichlorophenol	µg/L	0.1	<1	<0.1				
	2,6-dichlorophenol	µg/L	0.1	<1	<0.1				
	2-chlorophenol	µg/L	0.05	<1	<0.05				
	Pentachlorophenol	µg/L	0.05	<2	<0.05				
	tetrachlorophenols	µg/L	30						
Herbicides	Dinoseb	µg/L	100						
Inorganics	Ammonia as N	mg/L	0.01						
	Cyanide (Free)	mg/L	0.004		<0.004				
	Weak Acid Dissociable Cyanide	mg/L	0.004		<0.004				
Lead	Lead	µg/L	1			<1	<1		
	Lead (Filtered)	µg/L	0.1	<0.1	0.2			<1	
MAH	Styrene	µg/L	5						
Metals	Aluminium (Filtered)	mg/L	0.005	<0.005	<0.005				
	Antimony (Filtered)	mg/L	0.0002	<0.0002	<0.0002				
	Arsenic	µg/L	1			<1	<1		
	Arsenic (Filtered)	µg/L	0.2	<0.2	<0.2			<1	
	Barium (Filtered)	mg/L	0.0005	<0.0005	<0.0005				
	Beryllium (Filtered)	µg/L	0.1	<0.1	<0.1				
	Cadmium	µg/L	0.1			<0.1	<0.1		
	Cadmium (Filtered)	µg/L	0.05	<0.05	0.54			<0.1	
	Chromium	µg/L	1			<1	<1		
	Chromium (Filtered)	µg/L	0.2	<0.2	<0.2			<1	
	Chromium (hexavalent) (Filtered)	mg/L	0.01						
	Chromium (Trivalent) (Filtered)	mg/L	0.01						
	Cobalt (Filtered)	µg/L	0.1	<0.1	<0.1				
	Copper	µg/L	1			<1	<1		
	Copper (Filtered)	µg/L	0.5	<0.5	<0.5			<1	
	Manganese (Filtered)	mg/L	0.0005	<0.0005	<0.0005				
	Mercury	µg/L	0.1			<0.1	<0.1		
	Mercury (Filtered)	µg/L	0.1	<0.1	<0.1			<0.1	
	Nickel	µg/L	1			<1	<1		
	Nickel (Filtered)	µg/L	0.5	<0.5	<0.5			<1	
	Selenium (Filtered)	mg/L	0.0002	<0.0002	<0.0002				
	Silver (Filtered)	mg/L	0.0001	<0.0001	<0.0001				
	Vanadium (Filtered)	µg/L	0.2	<0.2	<0.2				
	Zinc	mg/L	0.005			<0.005	<0.005		
	Zinc (Filtered)	mg/L	0.001	0.003	0.004			<0.005	
other	Scheduled chemicals (NSW Waste 2008)	mg/L							
	Polycylic aromatic hydrocarbons EPA448	µg/L	0.5	<0.5					
	Total BTEX	mg/L	0.01						
PAH	7,12-dimethylbenz(a)anthracene	µg/L	0.1		<0.1				
PAH/Phenols	PAH (ESDAT TOTAL)	µg/L							
	PAH (total, NSW Waste 2008)	mg/L							
	Sum of 10 PAHs	mg/L							
	Sum of 5 PAHs	mg/L							
	2,4-dimethylphenol	µg/L	0.1	<1	0.2				
	2,4-dinitrophenol	mg/L	0.03						
	2-methylnaphthalene	µg/L	0.1		<0.1				
	2-methylphenol	µg/L	0.1	<1	<0.1				
	2-nitrophenol	µg/L	0.1	<1	<0.1				
	3-&4-methylphenol	µg/L	2	<2					
	3-methylcholanthrene	µg/L	0.1		<0.1				
	3-Methylphenol	µg/L	0.1		<0.1				
	4,6-Dinitro-2-methylphenol	µg/L	30						
	4-chloro-3-methylphenol	µg/L	0.05	<1	<0.05				
	4-methylphenol	mg/L	0.0001		<0.0001				
	4-nitrophenol	µg/L	0.1		<0.1				
	Acenaphthene	µg/L	0.01	<1	<0.1	<1		<1	
	Acenaphthylene	µg/L	0.01	<1	<0.1	<1		<1	
	Anthracene	µg/L	0.01	<1	<0.1	<1		<1	
	Benz(a)anthracene	µg/L	0.01	<1	<0.1	<1		<1	
	Benzo(a) pyrene	µg/L	0.01	<0.5	<0.05	<0.5		<0.5	

Appendix F
Table 2
Water QA/QC

Field_ID	QC637	QC646	QC655	QC662	QC665	TRIP BLANK	TRIP SPIKE
x_coord							
y_coord							
Monitoring_Round							
Sample_Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Trip_B	Trip_S
Sampled_Date_Time	20/04/2011	19/05/2011	8/02/2011	9/02/2011	11/02/2011	23/02/2011	23/02/2011
Monitoring_Zone							
Location_Code							
SDG	ES1108478	ES1110580	ES1102875	ES1102973	ES1103100	ES1104095	ES1104095
SampleComments							

Chem_Group	ChemName	output unit	EQL						
	Benzo(b)&(k)fluoranthene	µg/L	0.05						
	Benzo(b)fluoranthene	µg/L	0.1	<1	<0.1	<1		<1		
	Benzo(g,h,i)perylene	µg/L	0.01	<1	<0.1	<1		<1		
	Benzo(k)fluoranthene	µg/L	0.1	<1	<0.1	<1		<1		
	Chrysene	µg/L	0.01	<1	<0.1	<1		<1		
	Dibenz(a,h)anthracene	µg/L	0.01	<1	<0.1	<1		<1		
	Fluoranthene	µg/L	0.01	<1	<0.1	<1		<1		
	Fluorene	µg/L	0.01	<1	<0.1	<1		<1		
	Indeno(1,2,3-c,d)pyrene	µg/L	0.01	<1	<0.1	<1		<1		
	Naphthalene	µg/L	0.01	<1	<0.1	<1		<1		
	PAHs (Sum of total)	µg/L	0.05							
	Phenanthrene	µg/L	0.01	<1	<0.1	<1		<1		
	Phenol	µg/L	0.1	<1	0.1					
	Pyrene	µg/L	0.01	<1	<0.1	<1		<1		
Pesticides	Pesticides (total, NSW Waste 2008)	mg/L								
Phenolics	4,6-Dinitro-o-cyclohexyl phenol	µg/L	100							
	Phenols (Total Halogenated)	mg/L	0.01							
	Phenols (Total Non Halogenated)	mg/L	0.1							
SVOCs	2-(acetylamino) fluorene	µg/L	0.1		<0.1					
	Benzo(e)pyrene	µg/L	0.1		<0.1					
	Coronene	µg/L	0.1		<0.1					
	Dibenzofuran	µg/L	2							
	Hexachlorophene	µg/L	0.1		<0.1					
	Perylene	µg/L	0.1		<0.1					
TPH	TPH C15-C36	mg/L								
	TPH C10 - C14	µg/L	50	<50	<50	<50	<50	<50		
	TPH C15-C28	µg/L	100	<100	<100	<100	<100	<100		
	TPH C29-C36	µg/L	50	<50	<50	<50	<50	<50		
	TPH C6 - C9	µg/L	20	<20	<20	<20	<20	<20	<20	
	TPH+C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	<50	<50		
	TPH C10 - C40 (Sum of total)	µg/L	100		<100					
	TPH C6-C10	mg/L	0.02		<0.02					

Appendix G

Field Sheets

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP OGI	Well No: MW210 - COC1
Project Number: 60153531 - 6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 24.2.11	Sample by: LK / RS / KO

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 17.7	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other micro purge
Water Level Depth WL in m BTOC): 1.595	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 17.0 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 4.5L

Start: 10:15 Stop: 10:40 Elapsed: 25min Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
								Rate	
10:17	0.5	1.92	30036	6.65	-24.5	23.3	2.33	x3 CPM4	PSI 40
10:18	1.0	0.42	41257	6.17	-41.3	23.0	2.37	CPM4	" "
10:19	1.5	0.38	42381	6.08	-63.0	22.9	2.51	CPM4	" "
10:23	2.0	0.34	44169	6.00	-87.7	24.3	2.32	CPM2	" "
10:25	2.5	0.31	44317	5.98	-92.7	23.8	2.35	CPM2	" "
10:27	3.0	0.26	44057	5.98	-101.7	23.6	2.39	CPM1	" "
10:30	3.5	0.22	44471	6.00	-104.7	24.3	2.29	CPM1	" "
10:33	4.0	0.23	42949	6.05	-105.7	25.0	2.17	CPM1	" "
10:39	4.5	0.20	42091	6.12	-98.7	24.5	2.21	CPM1	" "

Observations during purging (well condition, tubidty, colour, odour, sheen): -
Turbid, mild tar odour, brown, no sheen
After sampling SWL 2.14m

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other Sample collected 10:45am

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☑ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW210	1x150 amber	PAH/TPH			
MW210	1x500mL amber	Ultratrace PAH/metals			
MW210	2x Vials	BTEX/VpTPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

* Well cap and Gatic cover on, well in good condition
MW210 1x200mL Plastic Pure HNO_3 field filtered (0.45µm)
MW210 1x250mL white Plastic $CdNO_3$/OH

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP OGI	Well No: MW62 – COC1.
Project Number: 60153531 - 6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK & DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 24.2.11	Sample by: LK / DS / KO

Well Purging

Purge Volume **Well Diameter (D in mm):** ☒ 50 ☐ 100 ☐ Other	Purge Method ☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 4.9	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other MicroPurge
Water Level Depth WL in m BTOC): 1.896	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 4.4 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 3-5

Start: 12:18 Stop: 12:37 Elapsed: 19 minutes. Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
								Rate	
12.26	0.5	0.27	39694	8.33	-232.9	26.0	1.893	CPM4	PSI 5
12:30	1.0	0.06	38416	7.84	-280.3	25.8	1.897	CPM5	" "
12.33	2.0	0.02	38021	7.75	-297.9	25.5	1.897	CPM5	" "
12:35	2.5	002	37791	7.72	-300.3	25.6	1.897	CPM5	" "
12:36	3.0	0.01	37611	7.67	-300.5	25.6	1.896	CPM5	" "
12.37	3.5	0.01	37530	7.65	-303.2	26.7	1.896	CPM5	" "

Observations during purging (well condition, tubidty, colour, odour, sheen): -
strong H_2S odour, slight turbidity changing to clear @ 1L. Sampled @ 12:45

Discharge water disposal: ☐ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other After sampling SWL 1.896m

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☒ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW62	1x150mL Amber	PAH/TPH			
MW62	1x500mL Amber	Ultratrace, PAH & metals			
MW62	2x Vials	BTEX/VpTPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

MW62 1x200mL Plastic Pure HNO_3 field filtered (0.45µm)
MW62 1x250mL White Plastic. $CdNO_3$/OH
* Well cap & Gattic cover on, well in good condition.

* & On filter Paper – Black fine sand sized particles (<5%)

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo pump out	Well No: MW68 - COC1.
Project Number: 60153531-61	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK / DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 24-2-11	Sample by: LK / DS

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 4.3	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other Micropurge
Water Level Depth WL in m BTOC):	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 3.8 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 3.5L

Start: 13:50 Stop: 14:01 Elapsed: 11 Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L) +/-10%	Cond. (µS/cm) +/- 3%	pH +/- 0.05	Redox (mV) +/- 10mV	Temp (°C) +/- 0.2°C	SWL (mBTOC)	Other	
								rate	PSI
13:51	0.5	0.14	16016	6.64	-122.5	24.7	2.120	cpm4	15
13:53	1.0	0.11	15945	6.74	-136.7	24.5	2.118		
13:54	1.5	0.11	15877	6.77	-147.7	24.4	2.120		
13:56	2.0	0.11	15845	6.79	-153.1	24.4	2.118		
13:57	2.5	0.09	15822	6.80	-157.6	24.4	2.118		
13:59	3.0	0.08	15815	6.81	-160.8	24.4	2.120		
14:01	3.5	0.08	15862	6.82	-164.4	24.4	2.116		

Observations during purging (well condition, tubidty, colour, odour, sheen): dark grey initially, turbid, changing to clear @ 3.5L Sampled @ 14:10

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other After sampling SWL 2.12 m

Well Sampling

Sampling Method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ **Same as purge method**

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW68	1x 100ml amber	PAH / phenols	-		
MW68	1x 500ml amber	TPH / Ultratrace PAH	-		
MW68	2x vials	BTEX / TPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

1 x 200ml plastic - HNO_3 - ultratrace metals
1 x 250ml plastic - $CdNO_3$ / NaOH - Cyanide.

* Well cap & Gatic cover on, well in good condition

* On filter paper - Black, fine sand sized particles (< 5%)

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo WMP D61	Well No: MW69 - COC2
Project Number: 60153531-61	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: DS / LK	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25-2-11	Sample by: LK / DS

Well Purging

Purge Volume	Purge Method Foot valve & tubing
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 11.13	☐ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other
Water Level Depth WL in m BTOC): 1.845	Pump Intake Setting Tubing at 0.5m
Number of well volumes to be purged (# VOLS) ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	**Depth (m BTOC)** from base.
	Screen Interval (m BTOC) – Top : **Bottom:**

Purge Volume Calculation

(11.13 - 1.845) x (25 /2)² x 3 x 0.00314 = 54

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME _____ PURGE RATE _____ ACTUAL PURGE VOLUME 56L

Start: 11:27 Stop: 12:05 Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other
11:29	1.0	1.74	2263	7.97	-81.4	25.5	1.960	
11:33	6.0	1.73	22402	6.84	-106.3	22.5	2.160	
11:35	11.0	1.22	24671	6.99	-111.3	22.4	2.290	
11:38	15.0	1.94	25403	7.05	-114.1	22.3	2.270	
11:40	21.0	1.48	25680	7.01	-115.3	22.3	2.270	
11:42	26.0	0.86	25382	6.99	-126.0	22.5	2.315	
11:45	31.0	1.21	25277	7.01	-125.4	22.3	2.360	
11:48	36.0	1.12	25176	7.01	-123.9	22.2	2.380	- pto for more readings
11:52	41.0	0.93	24800	7.12	-113.4	22.3	2.130	

Observations during purging (well condition, tubidty, colour, odour, sheen): - Grey, Highly Turbid, Tar odour, minor sheen, odar becoming stronger

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method ☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☒ **Same as purge method** ☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW69	1x 100ml amber	PAH/TPH	-		
MW69	1x 500ml amber	Ultra trace PAH & Metals	-		
MW69	2x vials	BTEX/TPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
/	/	/		/	

* Can't get micropurge past 1m BTOC. (24-2-11)
Use foot valve & tubing to sample well (25.2-11)

→ 1x 200mL plastic - HNO_3 field filtered @ 0.45 µm
1x 250mL plastic - $CdNO_3$ / OH -

Time	Vol.	DO	Cond.	PH	Redox	Temp.	SWL.
11:55	46.0	0.35	24222	7.02	-157.4	22.3	2.135
11:58	51.0	0.74	24001	7.16	-127.6	22.3	2.175
12:02	56.0	0.52	24148	7.07	-179.8	22.6	2.150

* After purging 52L - notice change from tar odour to sulfur odour.

12:10 Sample well.

Final SWL = 1.935

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP DGI	Well No: MW401 – COC2
Project Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK/DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 24.2.11	Sample by: LK/DS

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 20	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other Micro Purge
Water Level Depth WL in m BTOC): 2.438	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other Parameter Stabilisation.	**Depth (m BTOC)** 19.5 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 2.5

Start: 16:04 Stop: 16:24 Elapsed: 20mn Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
								Rate	
16:09	0.5	1.56	34881	6.61	-109.2	24.9	2.48	CPM6	PSI 100
16:15	1.0	0.93	37985	6.54	-116.4	24.4	2.475	CPM6	" "
16:18	1.5	0.30	37968	6.54	-119.0	24.2	2.472	CPM6	" "
16:21	2.0	0.26	37901	6.56	-121.0	24.0	2.472	CPM6	" "
16:24	2.5	0.21	37816	6.56	-122.7	23.9	2.475	CPM6	" "

Observations during purging (well condition, tubidty, colour, odour, sheen): - Sample d @ 16:30 Slightly turbid, slight orange tint, NO odour/sheen

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other After sampling SWL 2.47

Well Sampling

Sampling Method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ **Same as purge method**

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW401	1x 150mL Amber	PAH/TPH			
MW401	1x 500ml Amber	Ultratrace PAH + metals			
MW401	2x Vials	BTEX/VPTPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
MW401	QC615				
	QC616				

MW401 1x 200 mL Plastic Pure HNO_3 field filtered (0.45 µm)

MW401 1x 250 mL white plastic $CdNO_3$ /OH

* well Cap. & gattic cover on, well in good condition

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo MMP Dwl	Well No: 1T3 S - COC2
Project Number: 60153531(-6.1)	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK / DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25.2.11	Sample by: LK / DS

Well Purging

Purge Volume **Well Diameter (D in mm):** ☐ 50 ☐ 100 ☒ Other	Purge Method ☒ **Bailer – Type:** ☒ **PVC** ☐ **SS** ☐ **Teflon** ☐ **Other**
Total Depth of Well (TD in m BTOC): 3.465	☐ **Pump – Type:** ☐ **Submersible** ☐ **Bladder** ☐ **Other**
Water Level Depth WL in m BTOC): 2.347	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	**Depth (m BTOC)** **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(3.465 TD (m) - 2.347 WL (m)) x (30 /2)² D/2 (mm) x 3 #VOLS x 0.00314 = 2.36 Calculated Purge Volume (L)

PURGE TIME _____ PURGE RATE _____ ACTUAL PURGE VOLUME _____

Start: 7:44 Stop: Elapsed: Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other
7:50	1.0	2.67	43654	7.12	120.2	24.9	2.403	* well slow to purge with bailer due to low water level
8:03	2.0	3.04	43359	7.07	107.4	24.8	2.438	
8:10	2.5	3.04	43265	7.12	90.0	24.8	2.457	
	well going dry at 2.5L - allow to recharge - then sample.							
11:05	sample well using foot valve and tubing							

Observations during purging (well condition, tubidty, colour, odour, sheen): -
light brown, turbid, no sheen observed, no odour detected.

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method ☐ **Same as purge method**

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other ☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐

Other Foot valve and tubing

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T3 S	1x100ml amber	PAH/phenols	-		
1T3 S	1x500ml amber	TPH/ultratrace PAH	-		
1T3 S	2x vials	TPH/BTEX	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

1T3S 1x 200ml plastic - pure HNO_3 - ultratrace metals
1T3S 1x 250ml plastic - $CdNO_3$/OH - WAD Cyanide.

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP DCI	Well No: IT3 M – COC2
Project Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK/DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25.2.11	Sample by: LK/DS

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☐ 50 ☐ 100 ☒ Other 30mm	☒ **Bailer – Type:** ☐ **PVC** ☐ **SS** ☐ **Teflon** ☐ **Other** & Foot valve/tubing after purging 11L
Total Depth of Well (TD in m BTOC): 8.900	☐ **Pump – Type:** ☐ **Submersible** ☐ **Bladder** ☐ **Other**
Water Level Depth WL in m BTOC): 2.340	Pump Intake Setting foot valve at 0.5m
Number of well volumes to be purged (# VOLS) ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	**Depth (m BTOC)** from base of well.
	Screen Interval (m BTOC) – Top : **Bottom:**

Purge Volume Calculation

(8.900 - 2.340) x (30/2)² x 3 x 0.00314 = 13.9

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME _____ PURGE RATE _____ ACTUAL PURGE VOLUME 14.0

Start: 08:23 Stop: 09:48 Elapsed: 85 mins Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/em)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
08:23	1.0	1.99	14628	7.97	85.3	24.6	2.49		
08:31	2.0	2.31	23942	7.83	85.9	24.3	2.51		
08:39	3.0	1.66	35009	7.64	-3.2	24.1	2.53		
08:46	4.0	2.09	39410	7.64	-74.1	24.2	2.55		
08:53	5.0	2.28	42214	7.54	-75.8	24.3	2.57		
08:58	6.0	2.11	43709	7.34	-32.6	24.2	2.58		
09:04	7.0	2.34	44136	7.24	-5.0	24.1	2.59		
09:11	8.0	2.28	44211	7.22	17.9	24.0	2.61		
09:17	9.0	2.20	44341	7.19	30.0	24.0	2.62	– PID for further readings.	

Observations during purging (well condition, tubidty, colour, odour, sheen): - No odour detected, light brown, turbid.

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method ☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ **Same as purge method** (foot valve & tubing) ☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
IT3 M	1x 150ml amber	PAH/TPH	–		
IT3 M	1x 500ml amber	Ultratrace metals/PAH	–		
IT3 M	2x vials	BTEX/TPH	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	**Duplicate No**	**Type**	**Sample No**	**Type**	**Sample No**

IT3 M 1x 200 mL plastic pure HNO_3 field filtered (0.45 µm)
IT3 M 1x 250mL white plastic $CdNO_3$/6H

time	Vol	DO	Cond	pH	Redox	Temp	SWL
09:34	10.0	2.12	44316	7.19	82.4	23.9	2.64
09:42	11.0	2.02	44679	7.16	96.5	24.4	2.650
09:44	12.0	1.13	44238	7.14	45.9	24.2	2.660
09:45	13.0	0.81	44167	7.10	21.0	24.1	2.660
09:48	14.0	0.76	44015	7.10	-10.0	24.0	2.660

09:50 Sample.

* Note - started using foot valve and tubing after purging 11 L. Use foot valve to sample as well.

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP DCI	Well No: IT3D - COC2
Project Number: 60158531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LC/DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25-2-11	Sample by:

Well Purging

Purge Volume	Purge Method Foot valve and tubing
Well Diameter (D in mm): ☐ 50 ☐ 100 ☒ Other 30mm	☐ **Bailer – Type:** ☐ **PVC** ☐ **SS** ☐ **Teflon** ☐ **Other**
Total Depth of Well (TD in m BTOC): 14.6	☐ **Pump – Type:** ☐ **Submersible** ☐ **Bladder** ☐ **Other**
Water Level Depth WL in m BTOC): 2.308	Pump Intake Setting tubing 0.5m off base
Number of well volumes to be purged (# VOLS) ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other	**Depth (m BTOC)**
	Screen Interval (m BTOC) – Top : Bottom:

Purge Volume Calculation

(14.60 - 2.308) x (30 /2)² x 3 x 0.00314 = 26

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME _____ PURGE RATE _____ ACTUAL PURGE VOLUME 26

Start: 10:07 Stop: 10:38 Elapsed: 31 mins Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other
10:08	1	0.93	23542	7.40	-136.5	24.6	2.600	
10:11	3	0.57	39803	6.95	-129.6	23.0	2.635	
10:13	5	0.54	39923	6.99	136.4	22.8	2.605	
10:17	7	0.60	39729	7.04	-142.4	22.6	2.580	
10:20	9	0.46	39872	7.09	-146.9	22.7	2.610	
10:23	11	0.49	39877	7.15	-151.0	22.7	2.675	
10:25	14	0.82	39489	7.26	-148.2	22.3	2.640	
10:28	17	0.58	39577	7.32	-133.1	22.2	2.620	
10:31	20	0.79	39887	7.35	-123.8	22.2	2.685	- PTO for further readings

Observations during purging (well condition, tubidty, colour, odour, sheen): - Strong tar odour, initially clear, becoming grey and turbid, - slight sheen on surface

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☒ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
IT3D	1x 100ml Amber	PAH / TPH	-		
IT3D	1x 500ml Amber	Ultratrace metals / PAH	-		
IT3D	2x vials	TPH / BTEX	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

IT3D 1x 200ml plastic - HNO_3 field filtered
IT8D 1x250ml plastic - $cdNO_3$ / NaOH

time	Vol	DO	Cond.	PH	ReDOX	Temp	SWL
10:36	23.0	0.51	40961	7.34	-159.8	22.3	2.642
10:38	26.0	0.52	40944	7.33	-145.1	22.1	2.658

10:45 Sample well.

* Note well sealed by gattic cover - no well cap though.

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP OGS	Well No: MW198 - COC2.
Project Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK / DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25-2-2011	Sample by: LK / DS

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 6.350	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other Micro purge
Water Level Depth WL in m BTOC): 1.848	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 5.8 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____ /2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 5.0

Start: 13:40 Stop: 14:00 Elapsed: 20 mins Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L) +/- 10%.	Cond. (µS/cm) +/- 3%.	pH +/-0.05	Redox (mV) +/-10mV	Temp (°C) +/- 0.2°C	SWL (mBTOC)	Other	
								rate =	PSI
13:44	1.0	0.25	3692	6.43	-106.3	22.2	1.915	CPMS	10
13:48	2.0	0.17	3395	6.47	-110.2	22.1	1.925	CPMS	10
13:50	2.5	0.18	3156	6.49	-112.2	22.2	1.923	CPMS	10
13:52	3.0	0.18	2636	6.47	-108.3	22.2	1.920	CPMS	10
13:53	3.5	0.14	2085	6.44	-105.8	22.3	1.927	CPMS	10
13:55	4.0	0.13	1906	6.40	-102.8	22.4	1.930	CPMS	10
13:58	4.5	0.12	1788	6.38	-100.0	22.5	1.932	CPMS	10
13:59	5.0	0.11	1784	6.36	-98.7	22.6	1.938	CPMS	10
14:00	parameters have stabilised - collect sample.								

Observations during purging (well condition, tubidty, colour, odour, sheen): -
light brown, slightly turbid, slight sheen, tar odour detected.

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☒ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW198	1x 100ml amber	PAH / phenols	-		
MW198	1x 500ml amber	TPH / ultratrace PAH	-		
MW198	2x vials	TPH / BTEX	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
MW198	QC618				

MW198 1x 200ml plastic - pre HNO_3 - ultratrace metals
MW198 1x 250ml plastic - $CdNO_3$/OH - WAD cyanide

* Note well had no gattic cover but was sealed with well cap - gattic cover full with leaf litter and soil

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

some sediment in water initially

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP DG1	Well No: MW2045 – COC #3
Project Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 25.2.11	Sample by: LK/DS

Well Purging

Purge Volume	Purge Method
Well Diameter (D in mm): ☒ 50 ☐ 100 ☐ Other	☐ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (TD in m BTOC): 4.2	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ Other Micropurge
Water Level Depth WL in m BTOC): 1.525	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 3.7 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

* note 1 bailer removed prior to sampling to check for ONAPL

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME _____ PURGE RATE _____ ACTUAL PURGE VOLUME 2.75

Start: 15:41 Stop: 16:02 Elapsed 21 min Initial: Final: Final SWL = 3.358

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other		
								Rate		
15:43	0.5	1.23	742	6.34	-106.2	26.0	1.895	CPM4	PSI	10
15:47	1.0	0.27	745	6.53	-121.8	25.5	2.430	CPM4	"	"
15:54	1.5	0.32	759	6.61	-127.3	25.4	2.710	CPM2	"	"
15:59	2.0	0.23	762	6.61	-130.4	25.5	2.935	CPM2	"	"
16:02	2.75	0.14	767	662	-137.3	25.5	3.015			
" Stop pump.										
* parameters are stable except DO and SWL (ie not laminar flow) wait for well to recharge and sample										
16:10	sample.									

Observations during purging (well condition, tubidty, colour, odour, sheen): - Grey, Turbid, Tar odour - becomes clearer * well has very low recharge.

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ **Same as purge method**

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW2045	1 x 100mL Amber	PAH/Phenols			
MW2045	1 x 500mL Amber	TPH/Ultra trace PAH			
MW2045	2 x vials	TPH/BTEX	HCl		

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—					

MW2045 1 x 200mL Plastic Pure HNO_3 field filtered (0.45µm)
MW2045 1x 250mL white plastic $CdNO_3$/OH

* Gattic cover missing

* well has no gatric cover - sealed by well cap.

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo VMP DCI	Well No: MW08
Project Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK / DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 28-2-2011	Sample by: LK / DS

Well Purging

Purge Volume **Well Diameter (D in mm):** ☒ 50 ☐ 100 ☐ Other	Purge Method ☒ **Bailer – Type:** ☐ PVC ☐ SS ☐ Teflon ☐ **Other**
Total Depth of Well (TD in m BTOC): 5.200	☒ **Pump – Type:** ☐ Submersible ☐ Bladder ☐ **Other** micro purge
Water Level Depth WL in m BTOC): 2.360	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 4.8 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 7.0

Start: 08:06 Stop: 9:07 Elapsed: 61 mins Initial: Final:

Field Parameter Measurements @ +/- 10%.

Min since purge began	Volume Purged (L)	DO (mg/L) ppm	Cond. (µS/cm) +/- 3%	pH +/- 0.05	Redox (mV) +/- 10mV	Temp (°C) +/- 0.2°C	SWL (mBTOC)	Other	
								rate	PSI
08:09	0.5	0.57	32895	6.87	-234.5	24.7	2.655	CPM4	20
08:11	1.0	0.54	32757	7.54	-311.7	24.7	3.055	CPM5	30
08:13	1.5	0.02	30305	8.20	-349.2	25.1	3.311	CPM4	20
08:14	2.0	0.01	28685	8.26	-342.0	26.3	3.500	CPM3	20
08:16	3.0	0.01	26432	8.21	-325.8	25.3	3.655	CPM3	20
08:18	3.5	-	24602	8.14	-308.8	25.4	3.784	CPM3	20
08:19	4.6	-	23702	8.06	-278.4	25.5	4.040	CPM2	20
08:22	4.5	0.10	23736	7.87	-231.5	25.6	4.206	CPM2	20
08:26	stop pump allow recharge - PTO for further readings.								

Observations during purging (well condition, tubidty, colour, odour, sheen): - * cannot achieve laminar flow - stop pump and allow pot black and turbid initially, strong odour

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

☒ **Same as purge method**

☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW08	1x 100ml amber.	Ultratrace PAHs / phenols.			
MW08	1x 500ml amber	TPH (C10 - C36)			
MW08	2x vials	TPH / BTEX			

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

MW08 1x 200mL plastic - pure HNO_3 - Ultratrace metals

MW08 1x 250 mL plastic - $CdNO_3$ / NaOH - free & WAD cyanide

* Monitor recharge of well.

time	SWL	recharge
08:27	4.090	
08:28	4.020	- recharge 7cm (1 min)
08:29	3.957	- recharge 7cm (1 min)
08:31	3.842	- recharge 11cm (2 mins)
08:33	3.705	- recharge 14cm (2 mins)
08:37	3.510	- recharge 19cm (4 mins)
08:40	3.365	- recharge 15cm (3 mins)
08:43	3.200	- recharge 16cm (3 mins)
08:46	3.060	- recharge 20cm (3 mins)
08:49	2.925	- recharge 12cm (3 mins)
08:52	2.837	(after restarting pump.

time	volume	DO	cond.	pH	Redox	Temp.	SWL	rate
*08:50 - restart pump.								
08:57	5.0	-	29301	7.14	-227.2	25.3	3.021	CPM3 PSI 10
08:58	5.5	-	26419	7.28	-210.1	25.1	3.128	CPM2 PSI 10
09:01	6.0	0.34	25500	7.33	-168.3	26.3	3.290	CPM2 PSI 10
09:04	6.5	0.36	25413	7.33	-149.7	25.4	3.385	CPM2 PSI 10
09:07	7.0	0.18	27061	7.24	-173.0	25.4	3.528	CPM2 PSI 10

*. Parameters stabilised after purging 6.5 L - cannot achieve laminar flow - after 7.0L parameters spiked again - will sample as have achieved some stabilisation.

9:10 Sample well.

Final SWL = 3.720

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Baranguero VMP DGT	Well No: MW209
Project Number: 60153521-6-1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK/DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 28-2-11	Sample by:

Well Purging

Purge Volume **Well Diameter (D in mm):** ☒ 50 ☐ 100 ☐ Other	Purge Method ☐ **Bailer – Type:** ☐ **PVC** ☐ **SS** ☐ **Teflon** ☐ **Other**
Total Depth of Well (TD in m BTOC): 8.735	☐ **Pump – Type:** ☐ **Submersible** ☐ **Bladder** ☐ **Other** Mityopurge
Water Level Depth WL in m BTOC): 2.116	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter stabilisation	**Depth (m BTOC)** 8-2 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 3.0

Start: 10:45 Stop: 11:10 Elapsed: 16 mins Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
								Rate	PSI
10:47	0.5	0.2	45535	7.01	-188.3	22.5	2.225	LPM 5	35
10:50	1.0	0.56	45513	6.99	-209.1	22.0	2.290	"	"
10:52	1.5	0.21	45875	6.98	-212.7	22.2	2.340	"	"
10:55	2.0	0.08	46085	6.97	-213.2	22.2	2.382	LPM 4	"
10:58	2.5	0.06	46356	6.96	-208.2	22.3	2.420	"	"
11:01	3.0	0.07	46762	6.95	-208.7	22.6	2.420	"	"
	* Parameters stable @ 3L. Begin Sampling.								
11:10	Sample well.								

Observations during purging (well condition, tubidty, colour, odour, sheen): -
Black, Turbid, Tar odour, Slight sheen. Turning brown @ 3L. SWL = 2.370 after sampling

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☒ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW209	1x 100mL amber	Ultratrace	PAH/Phenols		
MW209	1x 500mL amber	TPH (C_{10}-C_{34})			
MW209	2x Vials	TPH/BTEX			

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

MW209 1x 200mL Plastic Pure HNO_3 Ultratrace metals
MW209 1x 250mL Plastic $CdNO_3$/OH Free & WAD Cyanide.

* Well Cap & Gatic cover on, well in good condition. – one screw missing

AECOM

CPFO473a (ENV) Site Contamination Analysis - Ground Water Sampling Form

CPFO473a (Env) Site Contamination Analysis- Ground Water Sampling Project Name: Barangaroo UMP DCI	Well No: MW200
Project Number: 60153581-6-1	Well Type: ☒ Monitor ☐ Extractor ☐ Other
Recorded By: LK / DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 28.2.2011	Sample by: LK / DS

Well Purging

Purge Volume **Well Diameter (D in mm):** ☐ 50 ☐ 100 ☐ Other	Purge Method ☐ **Bailer – Type:** ☐ **PVC** ☐ **SS** ☐ **Teflon** ☐ **Other**
Total Depth of Well (TD in m BTOC): 7.330	☐ **Pump – Type:** ☐ **Submersible** ☐ **Bladder** ☐ **Other** Micro Purge
Water Level Depth WL in m BTOC): 1.940	Pump Intake Setting
Number of well volumes to be purged (# VOLS) ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☒ Other parameter Stabilisation	**Depth (m BTOC)** 6.80 **Screen Interval (m BTOC) – Top :** **Bottom:**

Purge Volume Calculation

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = _____

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME 3.0

Start: 9:51 Stop: 10:06 Elapsed: (7 mins) Initial: Final:

Field Parameter Measurements

Min since purge began	Volume Purged (L)	DO (mg/L)	Cond. (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Other	
								Rate	PSI
09:53	0.5	1.12	12055	6.30	-73.5	22.7	2.140	CPM 4	20
09:55	1.0	0.62	12069	6.18	-91.6	22.8	2.447	CPM 2	20
09:58	1.5	0.39	12034	6.15	-108.4	22.8	2.570	CPM 2	20
10:01	2.0	0.41	11994	6.15	-118.9	22.8	2.705	CPM 2	20
10:04	2.5	0.42	11919	6.15	-127.0	22.8	2.928	CPM 2	20
10:06	3.0	0.48	11853	6.16	-136.2	22.9	3.090	CPM 2	20
	* Parameters stable @ 3L. Begin sampling								
10:10	sample well.								

Observations during purging (well condition, tubidty, colour, odour, sheen): - sampled @ 3L. SWL = 3.650 after sampling
Black Turbid, strong tar odour

Discharge water disposal: ☒ Drums ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

Well Sampling

Sampling Method
☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
☒ **Same as purge method**
☐ Pump – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other

Sample Distribution **Sample Series:**

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
MW200	1x 100 mL amber	Ultratrace	PAH/phenols		
MW200	1x 500mL amber	TPH (C_6-C_{36})			
MW200	2x vials	TPH/BTEX			

Quality Control Samples

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No

MW200 1x200mL plastic Pure HNO_3 Ultratrace metals
MW200 1x250mL plastic $CdNO_3$/OH Free & WAD cyanide.

* Well cap & Gattic cover on. Gattic full of water, but otherwise good condition.

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DGI	Well No: 1T04S
Job Number: 60153531	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 3.100	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.262	**PUMP INTAKE SETTING**
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC)
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 1.25 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 13:45 Stop: 14:05 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	4.37	15520	7.14	29.7	22.8			
	2	0.18	40720	7.10	45.6	22.6			
	3	0.19	43234	7.05	65.6	22.5			
	4	0.19	44675	7.03	65.9	22.5			
	5	0.21	44230	7.02	70.1	22.7			

Observations during purging (well condition, turbidty, colour, odour, sheen): slightly turbid, yellow/brown tint, no odour, no sheen.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T04S	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

* Rinsate from 1.P – QC646

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DGI	Well No: 1T04M
Job Number: 60153531	Well Type: ☒ Monitor ☐ Extraction ☑ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 17.328	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.075	**PUMP INTAKE SETTING**
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC)
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 22.5 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 12:40 Stop: 13:40 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	2.20	12819	6.29	-72.7	23.6			slight H/C odour
	5	0.40	9975	6.54	-175.7	20.5			H/C odour
	10	0.33	14723	6.69	-171.2	20.4			" "
	15	0.27	40830	6.81	-181.7	20.5			" "
	20	0.27	42110	6.86	-180.2	20.6			med-strong H/C odour.
	22	0.24	42298	6.93	-183.2	20.6			" "
	24	0.22	42339	6.93	-178.7	20.6			" "
	26	0.27	41998	6.92	-179.2	20.7			" "

Observations during purging (well condition, turbidty, colour, odour, sheen): clear, colourless, slight H/C odour, no sheen

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other Going turbid, dark grey @ 2L

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T04M	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
1T04M	QC644			Triplicate	QC645

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DGI	Well No: IT04D
Job Number: 60157531	Well Type: ☐ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☐ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by:

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☑ Other 25mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 31.900	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.260	PUMP INTAKE SETTING
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ___	Depth (m BTOC)
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)² x _____ x 0.00314 = 44 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 12:00 Stop: 12:37 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	5.05	1043	8.34	45.3	21.8			
	15	0.93	22093	6.08	12.3	20.4			
	15	0.47	30977	5.64	16.2	20.2			
	25	0.54	35240	5.55	26.7	20.3			Very slight H/C odour
	35	0.72	34416	5.50	29.8	20.2			" "
	40	0.79	33825	5.43	28.5	19.8			" "
	45	0.73	33733	5.42	28.1	20.1			" "

Observations during purging (well condition, turbidty, colour, odour, sheen): clear, very slight grey tint, no sheen, no odour.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other Going turbid, red/brown @ 5L

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
IT04D	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Brangaroo VMP DGI	Well No: 1TOSS
Job Number: 60153531	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 2.935	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.110	PUMP INTAKE SETTING
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____ ☐ Low Flow – parameter + drawdown stabilisation	Depth (m BTOC) Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 1.215 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 10.05 Stop: 16.30 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	2.84	40360	7.05	-6.0	20.5			
	2	3.05	41257	7.06	32.5	21.0			
	4	3.34	40994	7.05	26.1	21.4			
	5	3.49	40998	7.03	27.2	21.2			
	6	3.44	41211	7.08	27.8	21.3			

Observations during purging (well condition, turbidty, colour, odour, sheen): turbid, brown, no odour, no sheen.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1TOSS	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP OGI	Well No: 1T05 M
Job Number: 60153531	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 14.910	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.025	PUMP INTAKE SETTING
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC)
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)² x _____ x 0.00314 = 18.97 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 9:35 Stop: 9:58 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	2.97	21700	5.70	-59.3	19.9			
	5	4.24	39076	6.18	-45.3	19.1			
	10	4.80	38741	6.60	-1.6	18.7			
	15	4.75	38927	6.75	-6.6	18.6			
	20	4.58	39179	6.79	-5.4	18.5			

Observations during purging (well condition, turbidty, colour, odour, sheen): clear, colourless, no odour, no sheen.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T05M	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

• Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DGL	Well No: 1TOSD
Job Number: 60153531	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.5.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 26.71	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.260	PUMP INTAKE SETTING
Number of well purge volumes ☐ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC)
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)² x _____ x 0.00314 = 36.0L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start 8:21 Stop 9:10 Elapsed: Initial: Final:

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	4.06	12961	5.41	148.2	17.2			Slight H/C odour
	5	3.33	24757	5.10	71.7	19.6			" "
	15	1.57	30832	4.37	132.9	18.5			" "
	20	1.04	39339	4.17	124.0	19.0			" "
	25	1.29	39653	4.14	124.3	19.0			" "
	30	1.34	39802	4.13	122.4	19.1			" "
	35	1.32	39795	4.12	120.4	19.1			" "
	36	1.30	39808	4.12	121.1	19.1			" "

Observations during purging (well condition, turbidty, colour, odour, sheen): Clear, slight yellow tint, slight H/C odour, no sheen. going turbid, light brown @ SL

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1TOSD	7A, 2V, 5P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
1TOSD	QC643	—	—	—	—

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DGT	Well No: 1T06 Shallow
Job Number: 60153531-61	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 20.4.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 3.375	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 1.932 @ 7:50	PUMP INTAKE SETTING
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ___	Depth (m BTOC) 2.80 m
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 2.2L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 9:11 Stop: 9:30 Elapsed: Initial: Final: Sample after 5L at 9:25

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (~~µS~~/cm) mS	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	0.86	38.92	7.63	-118.0	21.6			
	2	0.66	41.09	7.59	-143.3	22.3			
	3	0.75	41.11	7.58	-140.0	22.7			
	4	0.86	41.02	7.58	-140.4	22.6			
	5	0.85	41.09	7.58	-141.7	22.3			

Observations during purging (well condition, turbidty, colour, odour, sheen): turbid, brown/grey, odourless, no sheen

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T06	4A, 4V, 3P				
Shallow					

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		Rinsate	QC637

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: ~~60153531~~ Barangaroo VMP 061	Well No: 1T06 Mid
Job Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 20.4.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 10.687	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 1.750 7:55	PUMP INTAKE SETTING
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC) 10.15 m
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 13.2 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 8:50 Stop: 9:05 Elapsed: Initial: Final: Sample after 16L at 9:02

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	5.61	0.300	10.47	-91.9	21.2			
	4	0.68	42.92	7.84	-174.9	21.1			
	8	0.56	43.53	7.74	-131.2	20.8			
	12	0.54	43.77	7.74	-128.9	21.1			
	16	0.77	43.86	7.74	-129.3	20.8			

Observations during purging (well condition, turbidty, colour, odour, sheen): Clear, colourless, odourless, no sheen. Going slightly turbid, light brown after 1L.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T06	4A, 4V, 3P				
MID					

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DG1	Well No: 1T06 Deep
Job Number: 60153531 - 61	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 20.4.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 19.555	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 1.927 @ 8:00	**PUMP INTAKE SETTING**
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____ ☐ Low Flow – parameter + drawdown stabilisation	Depth (m BTOC) 19.00m Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)² x _____ x 0.00314 = 26L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 8:10 Stop: 8:42 Elapsed: Initial: Final: Sample after 27L at 8:38

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (~~µS~~/cm) mS	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	2.42	11.00	6.28	27.9	20.4			
	5	1.10	11.83	5.97	15.5	20.4			
	10	0.92	16.88	5.32	95.2	19.9			
	15	1.05	15.57	5.16	102.5	19.7			
	20	1.22	14.56	5.12	98.3	19.8			
	25	1.02	14.42	5.10	102.1	19.8			
	27	0.97	14.00	5.05	105.1	19.8			

Observations during purging (well condition, turbidty, colour, odour, sheen): Clear, Very slight Grey tint, odourless, no sheen. Going slightly turbid & brown after 4L.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T06	4A, 4V, 3P				
Keep					

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barangaroo VMP DG1	Well No: 1T07 shallow
Job Number: 60153531-6.1	Well Type: ☐ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☐ PVC ☐ SS ☐ Other
Date: 19.4.11	Sample by:

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 3.115	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.405 @ 1:50	PUMP INTAKE SETTING
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ___	Depth (m BTOC) 2.60 m
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 1.05 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 3:01 Stop: Elapsed: Initial: Final: Sample after 5L at 3:16

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	3.51	46.21	7.42	-0.6	25.4			
	2	4.08	46.32	7.55	-31.0	23.7			
	3	2.79	45.90	7.39	-11.5	24.4			
	4	2.60	46.03	7.33	-9.3	24.6			
	5	2.85	45.99	7.36	-10.7	24.5			

Observations during purging (well condition, turbidty, colour, odour, sheen): Brown, moderately turbid, odourless, no sheen

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T07 shallow	4A, 4V, 2P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		Rinsate	QC636

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Barrangaroo VMP DSI	Well No: 1T07 Mid
Job Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.4.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 8.710	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.410 @ 1:44	PUMP INTAKE SETTING
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ___ ☐ Low Flow – parameter + drawdown stabilisation	Depth (m BTOC) 8.20 m Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 9.3L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 2.42 Stop: 2:57 Elapsed: Initial: Final: Sampled after 12L at 2:52

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (µS/cm)	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	1.38	15.12	8.01	-117.9	25.0			
	3	0.66	46.33	7.61	-135.1	23.7			
	6	0.47	46.51	7.66	-137.0	23.7			
	9	0.55	46.25	7.68	-127.4	23.5			
	12	0.50	46.77	7.69	-129.1	23.6			
									No sheen

Observations during purging (well condition, turbidty, colour, odour, sheen): clear, colourless, odourless. Going light grey & slightly turbid after 3L.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T07 Mid	4V, 4A, 2P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
—		—		—	

AECOM

Site Contamination Analysis – Ground Water Sampling

Job Name: Baranagaroo VMP DGI	Well No: 1T07 Deep
Job Number: 60153531-6.1	Well Type: ☒ Monitor ☐ Extraction ☐ Other
Recorded By: DS	Well Material: ☒ PVC ☐ SS ☐ Other
Date: 19.4.11	Sample by: DS

WELL PURGING

PURGE VOLUME	PURGE METHOD
Well Diameter (mm): ☐ 38 ☐ 50 ☐ 100 ☒ Other 25 mm	☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other
Total Depth of Well (m BTOC): 16.535	Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☒ ; Passive Diffusion ☐ ; Other ☐
Water Level Depth WL (m BTOC): 2.435 @ 1:40	PUMP INTAKE SETTING
Number of well purge volumes ☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____	Depth (m BTOC) 16.00
☐ Low Flow – parameter + drawdown stabilisation	Screen Interval (m BTOC) – Top : Bottom:

PURGE VOLUME CALCULATION

(_____ - _____) x (_____/2)^2 x _____ x 0.00314 = 20.7 L

TD (m) WL (m) D/2 (mm) #VOLS Calculated Purge Volume (L)

PURGE TIME_____ PURGE RATE_____ ACTUAL PURGE VOLUME_____

Start: 2:15 Stop: 2:39 Elapsed: Initial: Final: Sampled after 24L at 2:35.

FIELD PARAMETER MEASUREMENTS

Time	Volume Purged (L)	Dissolved Oxygen (mg/L)	Cond (~~µS~~/cm) mS	pH	Redox (mV)	Temp (°C)	SWL (mBTOC)	Flow rate (L / min)	Notes
	1	1.62	16.56	7.51	-73.3	25.3			
	5	0.21	44.39	7.52	-191.8	22.7			
	10	0.54	45.42	7.53	-178.0	22.1			
	15	0.18	45.76	7.55	-177.0	21.6			
	20	0.47	46.21	7.56	-168.7	21.8			
	22	0.69	45.74	7.58	-176.1	21.8			
	24	0.72	45.90	7.57	-165.3	21.6			

Observations during purging (well condition, turbidty, colour, odour, sheen): clear, colourless, odourless. Going grey & turbid after 2L. No sheen.

Discharge water disposal: ☒ Container ☐ Sanitary sewer ☐ Storm sewer ☐ Surface ☐ Other

WELL SAMPLING

SAMPLING METHOD Same as Purge method ☒

☐ Bailer – Type: ☐ PVC ☐ SS ☐ Teflon ☐ Other Bladder Pump ☐ ; Peristaltic Pump ☐ ; Foot-valve ☐ ; Passive Diffusion ☐ ; Other ☐

SAMPLE DISTRIBUTION Sample Series:

Sample No.	Vol/Cont.	Analysis	Preservatives	Lab	Comments
1T07 Deep	4A, 4V, 2P				

QUALITY CONTROL SAMPLES

Duplicate Samples		Blank Samples		Other Samples	
Original No	Duplicate No	Type	Sample No	Type	Sample No
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Appendix H

Laboratory Certificates

CERTIFICATE OF ANALYSIS

Work Order	: **ES1102875**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 09-FEB-2011
Sampler	: LK/KO	Issue Date	: 17-FEB-2011
Site	: ----		
		No. of samples received	: 39
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control 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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **'Am' Amosite (brown asbestos)**
- **'Ch' Chrysotile (white asbestos)**
- **'Cr' Crocidolite (blue asbestos)**
- **Legend for Asbestos Type:**
- **'t' Trace levels**
- **'UMF' Unknown mineral fibres**
- **Asbestos Identification: Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **Confirmation by alternative techniques is recommended for samples where unknown mineral fibres are detected. Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP071: The result for sample ES1102875_005,007,014,015,&016 was confirmed by re-extraction and re-analysis.**
- **EP080: Results of QC653 and QC602 have been confirmed by reanalysis.**
- **EP080:Level of Reporting raised for toluene due to ambient background levels in the laboratory.**
- **EPO75(SIM) : Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH404_0.4-0.5	BH404_4.0-4.4	BH404_7.0-7.4	BH404_12-12.4	BH404_14-14.4
				Client sampling date / time: 08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00
				ES1102875-001	ES1102875-002	ES1102875-003	ES1102875-004	ES1102875-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	4.6	16.8	9.3	23.3	30.4
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	132207-33-1	0.1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	29.6	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	5	28
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	2
Chromium	7440-47-3	2	mg/kg	12	6	13	7	53
Copper	7440-50-8	5	mg/kg	30	10	124	78	228
Lead	7439-92-1	5	mg/kg	179	89	78	92	804
Nickel	7440-02-0	2	mg/kg	25	<2	15	6	18
Zinc	7440-66-6	5	mg/kg	109	43	44	119	665
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	<0.1	0.7	5.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	1.4	<0.5	127	<0.5	88.0
Acenaphthylene	208-96-8	0.5	mg/kg	3.0	1.6	<4.0	<0.5	11.6
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	47.6	<0.5	10.6
Fluorene	86-73-7	0.5	mg/kg	1.5	1.1	62.4	<0.5	15.6
Phenanthrene	85-01-8	0.5	mg/kg	8.0	6.6	323	<0.5	38.8
Anthracene	120-12-7	0.5	mg/kg	3.7	2.5	93.3	<0.5	13.9
Fluoranthene	206-44-0	0.5	mg/kg	17.4	10.0	212	0.9	52.5
Pyrene	129-00-0	0.5	mg/kg	17.0	9.5	219	0.9	51.0
Benz(a)anthracene	56-55-3	0.5	mg/kg	6.4	3.5	75.2	<0.5	21.9
Chrysene	218-01-9	0.5	mg/kg	5.1	2.5	68.6	<0.5	15.7
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	7.0	3.5	53.5	<0.5	20.0
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.5	1.2	28.4	<0.5	9.0
Benzo(a)pyrene	50-32-8	0.5	mg/kg	6.2	3.0	52.7	<0.5	11.6
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.9	1.0	20.9	<0.5	4.6
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.8	<0.5	5.8	<0.5	1.4
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	3.2	1.5	26.0	<0.5	5.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	125
C10 - C14 Fraction	----	50	mg/kg	<50	<50	650	<50	<50
C15 - C28 Fraction	----	100	mg/kg	280	230	5240	<100	1280

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH404_0.4-0.5	BH404_4.0-4.4	BH404_7.0-7.4	BH404_12-12.4	BH404_14-14.4
				Client sampling date / time: 08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00
				ES1102875-001	ES1102875-002	ES1102875-003	ES1102875-004	ES1102875-005
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	**210**	**150**	**1820**	<100	**780**
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**490**	**380**	**7710**	<50	**2060**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	**11.5**
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**6.6**
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**14.5**
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**26.5**
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	**8.6**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**111**	**116**	**83.1**	**113**	**112**
2-Chlorophenol-D4	93951-73-6	0.1	%	**114**	**114**	**77.8**	**113**	**110**
2.4.6-Tribromophenol	118-79-6	0.1	%	**106**	**105**	**56.5**	**108**	**115**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**113**	**115**	**87.6**	**110**	**115**
Anthracene-d10	1719-06-8	0.1	%	**110**	**108**	**113**	**112**	**104**
4-Terphenyl-d14	1718-51-0	0.1	%	**114**	**102**	**94.5**	**111**	**93.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**103**	**118**	**125**	**125**	**86.9**
Toluene-D8	2037-26-5	0.1	%	**111**	**128**	**130**	**130**	**106**
4-Bromofluorobenzene	460-00-4	0.1	%	**108**	**123**	**125**	**129**	**94.1**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH404_15-15.4	QC653	BH406_4.0-4.2	BH406_7.0-7.2	BH406_10.0-10.3
				Client sampling date / time: 08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00
				ES1102875-006	ES1102875-007	ES1102875-010	ES1102875-011	ES1102875-012
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	20.8	27.1	16.5	20.7	15.8
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	No	----
Asbestos Type	132207-33-1	0.1	--	----	----	----	-	----
Sample weight (dry)	----	0.01	g	----	----	----	39.1	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	P.RENNIE	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	21	7	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	29	20	55	5
Copper	7440-50-8	5	mg/kg	<5	132	51	94	55
Lead	7439-92-1	5	mg/kg	61	334	161	<5	27
Nickel	7440-02-0	2	mg/kg	<2	12	7	32	3
Zinc	7440-66-6	5	mg/kg	<5	508	143	38	29
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	2.6	0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	7.6	60.6	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	9.2	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	7.8	<0.5	<0.5	0.9
Fluorene	86-73-7	0.5	mg/kg	0.6	9.3	<0.5	<0.5	0.6
Phenanthrene	85-01-8	0.5	mg/kg	0.9	29.0	1.5	1.0	3.1
Anthracene	120-12-7	0.5	mg/kg	<0.5	11.8	0.6	<0.5	1.0
Fluoranthene	206-44-0	0.5	mg/kg	0.6	44.7	2.7	2.6	3.4
Pyrene	129-00-0	0.5	mg/kg	0.5	42.6	7.2	3.0	3.3
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	16.6	1.2	1.1	1.3
Chrysene	218-01-9	0.5	mg/kg	<0.5	11.2	0.9	0.9	1.1
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	15.6	2.1	0.9	1.1
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4.5	0.7	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	10.2	1.7	0.9	1.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4.2	0.7	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	1.2	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4.5	0.9	<0.5	0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	87	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	130	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	1160	110	140	150

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH404_15-15.4	QC653	BH406_4.0-4.2	BH406_7.0-7.2	BH406_10.0-10.3
				Client sampling date / time: 08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00	08-FEB-2011 15:00
				ES1102875-006	ES1102875-007	ES1102875-010	ES1102875-011	ES1102875-012
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	<100	**720**	**180**	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**130**	**1880**	**290**	**140**	**150**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**1.2**	**9.8**	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	**1.3**	**7.1**	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	**9.8**	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**1.0**	**19.3**	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	**5.8**	<0.5	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**113**	**114**	**116**	**106**	**109**
2-Chlorophenol-D4	93951-73-6	0.1	%	**114**	**102**	**115**	**113**	**106**
2.4.6-Tribromophenol	118-79-6	0.1	%	**108**	**111**	**112**	**99.6**	**105**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**113**	**111**	**112**	**107**	**116**
Anthracene-d10	1719-06-8	0.1	%	**107**	**104**	**111**	**108**	**114**
4-Terphenyl-d14	1718-51-0	0.1	%	**110**	**99.6**	**93.9**	**109**	**112**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**81.0**	**84.2**	**111**	**127**
Toluene-D8	2037-26-5	0.1	%	**116**	**90.7**	**97.1**	**110**	**123**
4-Bromofluorobenzene	460-00-4	0.1	%	**122**	**89.7**	**94.8**	**117**	**127**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH406_14.0-14.4	BH406_15.0-15.4	BH406_16.0-16.5	QC602	----
				Client sampling date / time: 08-FEB-2011 15:00	08-FEB-2011 15:00	09-FEB-2011 15:00	08-FEB-2011 15:00	----
				ES1102875-013	ES1102875-014	ES1102875-015	ES1102875-016	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**21.1**	**13.5**	**14.8**	**13.6**	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**11**	<5	**10**	<5	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	**20**	**5**	**9**	**5**	----
Copper	7440-50-8	5	mg/kg	**163**	<5	<5	<5	----
Lead	7439-92-1	5	mg/kg	**250**	**7**	**7**	**6**	----
Nickel	7440-02-0	2	mg/kg	**13**	<2	<2	<2	----
Zinc	7440-66-6	5	mg/kg	**214**	<5	<5	<5	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**1.4**	<0.1	<0.1	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	**76.7**	**401**	**1170**	**236**	----
Acenaphthylene	208-96-8	0.5	mg/kg	**33.5**	**65.3**	**231**	**33.2**	----
Acenaphthene	83-32-9	0.5	mg/kg	**31.3**	**10.0**	**34.3**	**6.2**	----
Fluorene	86-73-7	0.5	mg/kg	**57.2**	**58.0**	**220**	**30.3**	----
Phenanthrene	85-01-8	0.5	mg/kg	**200**	**153**	**529**	**89.6**	----
Anthracene	120-12-7	0.5	mg/kg	**68.2**	**50.3**	**162**	**32.3**	----
Fluoranthene	206-44-0	0.5	mg/kg	**200**	**94.8**	**323**	**61.2**	----
Pyrene	129-00-0	0.5	mg/kg	**168**	**80.4**	**266**	**48.9**	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	**77.5**	**39.8**	**114**	**25.5**	----
Chrysene	218-01-9	0.5	mg/kg	**55.4**	**28.6**	**93.7**	**16.8**	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	**49.0**	**24.5**	**92.0**	**15.0**	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	**22.9**	**12.2**	**26.5**	**4.6**	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	**50.8**	**24.2**	**78.1**	**15.8**	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	**17.9**	**8.4**	**26.6**	**5.2**	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	**5.1**	<4.0	**7.5**	<4.0	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	**19.1**	**9.5**	**29.4**	**6.1**	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	**30**	**190**	**861**	**505**	----
C10 - C14 Fraction	----	50	mg/kg	**90**	**1340**	**1940**	**850**	----
C15 - C28 Fraction	----	100	mg/kg	**920**	**2720**	**3000**	**2020**	----
C29 - C36 Fraction	----	100	mg/kg	**400**	**770**	**900**	**640**	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**1410**	**4830**	**5840**	**3510**	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**3.8**	**15.1**	**85.0**	**35.8**	----
Toluene	108-88-3	0.5	mg/kg	**1.6**	**31.0**	**140**	**68.6**	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH406_14.0-14.4	BH406_15.0-15.4	BH406_16.0-16.5	QC602	----
				Client sampling date / time	08-FEB-2011 15:00	08-FEB-2011 15:00	09-FEB-2011 15:00	08-FEB-2011 15:00	----
Compound	CAS Number	LOR	Unit		ES1102875-013	ES1102875-014	ES1102875-015	ES1102875-016	----
EP080: BTEX - Continued									
Ethylbenzene	100-41-4	0.5	mg/kg		2.6	3.2	10.9	6.8	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		4.4	36.9	126	76.6	----
ortho-Xylene	95-47-6	0.5	mg/kg		2.3	13.1	45.8	28.8	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		75.4	86.4	76.8	86.0	----
2-Chlorophenol-D4	93951-73-6	0.1	%		76.6	80.7	83.8	92.7	----
2.4.6-Tribromophenol	118-79-6	0.1	%		43.1	51.3	58.4	56.3	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		86.4	81.9	89.3	82.0	----
Anthracene-d10	1719-06-8	0.1	%		102	115	104	101	----
4-Terphenyl-d14	1718-51-0	0.1	%		90.8	96.6	101	89.1	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		87.1	85.9	99.0	87.4	----
Toluene-D8	2037-26-5	0.1	%		99.7	105	118	107	----
4-Bromofluorobenzene	460-00-4	0.1	%		95.8	95.2	131	108	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC655	----	----	----	----
				Client sampling date / time: 08-FEB-2011 15:00	----	----	----	----
				ES1102875-008	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	QC655	----	----	----	----
				Client sampling date / time	08-FEB-2011 15:00	----	----	----	----
					ES1102875-008	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**21.3**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**41.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**46.3**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**41.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**55.8**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**52.9**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**120**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		**112**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**101**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	BH404_0.4-0.5 - 08-FEB-2011 15:00	Pale grey-brown fine-grained soil with one medium sized grey rock and small red-brown rocks and coal pieces
EA200: Description	BH406_7.0-7.2 - 08-FEB-2011 15:00	Pale brown gravelly soil with some vegetation and small to medium sized red-brown and grey rocks and coal and concrete pieces

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

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Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153581/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Stream / Forward Lab / Split WO
Lab / Analysis: Asbestos / Newcastle
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES1102875
Attach By PO / Internal Sheet:

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details:)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: METALS (8)	PAH	TPH / BTEX	ASBESTOS	HOLD	Other
1	BH404_0.4-0.5	8/2/11		X					X		250ml*	X	X	X	X		
(17)	BH404_1.0-1.1										"					X	
(18)	BH404_2.0-2.4										150ml					X	
(19)	BH404_3.0-3.4										"					X	
2	BH404_4.0-4.4										"	X	X	X			
(20)	BH404_6.0-6.4										"					X	
3	BH404_7.0-7.4										"	X	X	X			
(21)	BH404_9.0-9.4										"					X	
(22)	BH404_10-10.4										"					X	
4	BH404_12-12.4										"	X	X	X			
(23)	BH404_13-13.4										"					X	
5	BH404_14-14.4										"	X	X	X			
6	BH404_15-15.4										250ml	X	X	X			
(24)	BH403_0.4-0.5	↓		↓					↓		250ml						

Environmental Division Sydney
Work Order
ES1102875
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * Plus Zip Lock Bag

Lab Report No.

Esky ID

5 x C

1550

Relinquished by: Lauren Kontus / Kate O'Brien Signed: Date: 26/08/2010

Recieved by: Signed: Date:

Relinquished by: Signed: Date:

Recieved by: Signed: Date: 9/2/11

COC #2 page 2/4

Chain of Custody

AECOM

AECOM - Sydney		
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999	
	Fax: 61 2 8484 8989	
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com	
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1	

Laboratory Details

Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: Metals (6)	PAH	TPH / BTEX	Asbestos	HOLD	Other
25	BH402_1.0-1.1	8/2/11		X					X		250ml					X	
26	BH402_0.5-0.6	↓									180ml*					X	
27	BH402_1.0-1.1										250ml					X	
28	BH401_0.5-0.6										" *					X	
29	BH401_1.0-1.1										"					X	
30	BH400_0.5-0.6										"					X	
31	BH400_1.0-1.1	↓									"					X	
32	QC650										250ml					X	
33	QC652										180ml					X	
7	QC653										"	X	X	X			
8	QC655	↓		↓					↓		**	X	X	X			

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * plus zip lock bag. ** 2x vials / 1x plastic / 1 x amber

Lab Report No.

Esky ID

See 1550

Relinquished by: Lauren Kontus	Signed: Kate O'Brien	Date: 26/08/2010	Time:
Recieved by:	Signed:	Date:	Time:
Relinquished by:	Signed:	Date:	Time:
Recieved by:	Signed: AES.	Date: 9/2/11	Time:

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BMS-PM-DV-F046

Revision: Jun 08

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Chain of Custody

AECOM

AECOM - Sydney
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Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	Metals (8)	PAH	TPH/BTEX	ASBESTOS	H&O	Other
(34) ~~9~~	BH406_1.0-1.1	8-2-11	-	X					X		1x150mL Jar	X						
(35)	BH406_2.0-2.2	8-2-11	-	X					X		"	X						
9	BH406_3.0-3.2	8-2-11	-	X					X		1x150mL Jar 1x ziplock bag	X	X	X	X	X		
10	BH406_4.0-4.2	8-2-11	-	X					X		1x150mL Jar	X	X	X	X			
11	BH406_7.0-7.2	8-2-11	-	X					X		1x150mL Jar 1x ziplock	X	X	X	X	X		
(36)	BH406_8.0-8.5	8-2-11	-	X					X		1x150mL Jar	X						
12	BH406_10.0-10.3	8-2-11	-	X					X		"	X	X	X	X			
(37)	BH406_12.0-12.1	8-2-11	-	X					X		"	X						
(38)	BH406_13.0-13.2	8-2-11	-	X					X		"	X						
13	BH406_14.0-14.4	8-2-11	-	X					X		"	X	X	X	X			
14	BH406_15.0-15.4	8-2-11	-	X					X		"	X	X	X	X			
15	BH406_16.0-16.5	~~8~~ 8-2-11	-	X					X		1x250mL Jar	X	X	X	X		PID 900 ppm	
(39)	QC600	8-2-11	-	X					X		1x150 mL Jar	X						
~~X~~	~~BH406~~	~~8-2-11~~	-	~~X~~					~~X~~		~~X~~	X						

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg ~~X~~

Comments:

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus / Kate O'Brien Signed: Date: 9/2/11

Recieved by: Signed: Date:

Relinquished by: Signed: Date:

Recieved by: Signed: Date: 9/2/11

COC #2 Page 4/4

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Gordon, NSW 2072
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email : _____	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: HOLD	Metals (8)	PAH	TPH/BTEX	ASBESTOS	Other
16	QC602	8-2-11	-	X					X		1x150ml jar	X	X	X	X		
~~16~~	~~QC603~~	~~8-2-11~~	-	~~X~~					~~X~~		"	X					

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID 1550 5-6

Relinquished by: Lauren Kontus / Kate O'Brien Signed: Date: 2/08/2010

Recieved by: Signed: Date:

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Relinquished by: Signed: Date:

Recieved by: Signed: Date: 9/2/11

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1102875**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 4
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 09-FEB-2011	Issue Date	: 17-FEB-2011
Client Requested Due Date	: 17-FEB-2011	Scheduled Reporting Date	: **17-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.6'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 39
Security Seal	: Intact.	No. of samples analysed	: 16

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.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Analysis added to sample BH402_1.0 -.1.1 as per Kate O'Brien 17/2/11.**
- **Samples QC651, QC654, QC601, QC603 will be forwarded to Labmark.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EA200 Asbestos Identification in Soils	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1102875-001	08-FEB-2011 15:00	BH404_0.4-0.5		✓	✓
ES1102875-002	08-FEB-2011 15:00	BH404_4.0-4.4			✓
ES1102875-003	08-FEB-2011 15:00	BH404_7.0-7.4			✓
ES1102875-004	08-FEB-2011 15:00	BH404_12-12.4			✓
ES1102875-005	08-FEB-2011 15:00	BH404_14-14.4			✓
ES1102875-006	08-FEB-2011 15:00	BH404_15-15.4			✓
ES1102875-007	08-FEB-2011 15:00	QC653			✓
ES1102875-009	08-FEB-2011 15:00	BH406_3.0-3.2	✓		
ES1102875-010	08-FEB-2011 15:00	BH406_4.0-4.2			✓
ES1102875-011	08-FEB-2011 15:00	BH406_7.0-7.2		✓	✓
ES1102875-012	08-FEB-2011 15:00	BH406_10.0-10.3			✓
ES1102875-013	08-FEB-2011 15:00	BH406_14.0-14.4			✓
ES1102875-014	08-FEB-2011 15:00	BH406_15.0-15.4			✓
ES1102875-015	09-FEB-2011 15:00	BH406_16.0-16.5			✓
ES1102875-016	08-FEB-2011 15:00	QC602			✓
ES1102875-017	08-FEB-2011 15:00	BH404_1.0-1.1	✓		
ES1102875-018	08-FEB-2011 15:00	BH404_2.0-2.4	✓		
ES1102875-019	08-FEB-2011 15:00	BH404_3.0-3.4	✓		
ES1102875-020	08-FEB-2011 15:00	BH404_6.0-6.4	✓		
ES1102875-021	08-FEB-2011 15:00	BH404_9.0-9.4	✓		
ES1102875-022	08-FEB-2011 15:00	BH404_10-10.4	✓		
ES1102875-023	08-FEB-2011 15:00	BH404_13-13.4	✓		
ES1102875-024	08-FEB-2011 15:00	BH403_0.4-0.5	✓		
ES1102875-025	08-FEB-2011 15:00	BH403_1.0-1.1	✓		
ES1102875-026	08-FEB-2011 15:00	BH402_0.5-0.6	✓		
ES1102875-027	08-FEB-2011 15:00	BH402_1.0-1.1			✓
ES1102875-028	08-FEB-2011 15:00	BH401_0.5-0.6	✓		
ES1102875-029	08-FEB-2011 15:00	BH401_1.0-1.1	✓		
ES1102875-030	08-FEB-2011 15:00	BH400_0.5-0.6	✓		
ES1102875-031	08-FEB-2011 15:00	BH400_1.0-1.1	✓		
ES1102875-032	08-FEB-2011 15:00	QC650	✓		
ES1102875-033	08-FEB-2011 15:00	QC652	✓		
ES1102875-034	08-FEB-2011 15:00	BH406_1.0-1.1	✓		
ES1102875-035	08-FEB-2011 15:00	BH406_2.0-2.2	✓		
ES1102875-036	08-FEB-2011 15:00	BH406_8.0-8.5	✓		

			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1102875-037	08-FEB-2011 15:00	BH406_12.0-12.1	✓		
ES1102875-038	08-FEB-2011 15:00	BH406_13.0-13.2	✓		
ES1102875-039	08-FEB-2011 15:00	QC600	✓		

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26T TPH/BTEX/PAH/Total 8 Metals
ES1102875-008	08-FEB-2011 15:00	QC655	✓

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com
MR ANTHONY DAVIS		
- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com
MS JENNIFER CULLEN		
- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com
MS KATE O BRIEN		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
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- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1102875**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 09-FEB-2011
Sampler	: LK/KO	Issue Date	: 17-FEB-2011
Order number	: 39540AUS		
		No. of samples received	: 39
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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: 1667277)									
ES1102801-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.9	27.1	4.4	0% - 20%
ES1102875-005	BH404_14-14.4	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	30.4	31.5	3.4	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1667090)									
ES1102671-073	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	7	25.3	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	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES1102671-125	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	15	31.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	18	15	14.9	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1667092)									
ES1102875-006	BH404_15-15.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<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	61	49	20.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES1102882-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	4	35.4	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	13	13	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	12	13	9.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	13	11	11.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1667091)									
ES1102671-073	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1102671-125	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	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 (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1667093)									
ES1102875-006	BH404_15-15.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1102882-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1667472)									
ES1102875-001	BH404_0.4-0.5	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	1.4	1.7	20.6	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	3.0	3.7	20.4	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	1.8	18.6	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	8.0	9.0	11.9	0% - 50%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	3.7	3.8	4.6	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	17.4	18.0	2.9	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	17.0	16.8	1.3	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	6.4	6.4	0.0	0% - 50%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	5.1	5.2	0.0	0% - 50%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	7.0	7.1	1.7	0% - 50%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.5	3.0	18.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	6.2	6.5	4.2	0% - 50%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.9	3.5	16.5	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.8	1.0	23.4	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	3.2	3.4	6.4	No Limit
ES1102875-012	BH406_10.0-10.3	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	0.7	31.9	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	0.9	0.8	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	0.6	0.6	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	3.1	3.2	5.1	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	1.0	1.3	26.3	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	3.4	4.2	20.7	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	3.3	3.6	9.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.3	1.5	12.4	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.1	1.5	31.8	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.1	1.6	33.7	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	1.1	1.5	27.2	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	0.6	24.4	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	0.5	0.7	37.3	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1666311)									
ES1102875-001	BH404_0.4-0.5	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1102875-013	BH406_14.0-14.4	EP080: C6 - C9 Fraction	----	10	mg/kg	30	32	7.3	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667471)									

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: 1667471) - continued									
ES1102875-001	BH404_0.4-0.5	EP071: C15 - C28 Fraction	----	100	mg/kg	280	320	13.9	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	210	240	12.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1102875-012	BH406_10.0-10.3	EP071: C15 - C28 Fraction	----	100	mg/kg	150	170	9.2	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
EP080: BTEX (QC Lot: 1666311)									
ES1102875-001	BH404_0.4-0.5	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
ES1102875-013	BH406_14.0-14.4	EP080: Benzene	71-43-2	0.2	mg/kg	3.8	3.6	4.5	0% - 50%
		EP080: Toluene	108-88-3	0.5	mg/kg	1.6	1.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	2.6	2.9	10.3	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	4.4	4.5	3.1	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	2.3	2.6	11.1	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 1665852)									
ES1102875-008	QC655	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1102914-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.006	0.006	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1667184)									
ES1102806-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1102937-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1666061)									
ES1102834-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	141	122	14.3	0% - 20%
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
ES1102893-010	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1666060)									
ES1102834-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	6120	6900	12.0	0% - 20%
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1666132)									
ES1102834-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1102838-002	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	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 (%)
EP080: BTEX (QC Lot: 1666132)									
ES1102834-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
ES1102838-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
EG005T: Total Metals by ICP-AES (QCLot: 1667090)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	111	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	103	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	103	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	101	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	99.9	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	102	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	97.7	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1667092)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	114	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	106	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	107	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	106	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	103	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	106	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	101	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667091)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	94.6	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667093)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	99.6	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667472)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	8 mg/kg	# 81.2	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	8 mg/kg	80.0	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	8 mg/kg	82.3	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	8 mg/kg	85.5	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	8 mg/kg	# 77.9	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	8 mg/kg	81.4	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	8 mg/kg	86.7	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	8 mg/kg	90.7	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	8 mg/kg	90.2	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	8 mg/kg	93.1	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	8 mg/kg	80.8	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	8 mg/kg	86.2	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	8 mg/kg	85.5	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	8 mg/kg	85.8	71	113

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667472) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	8 mg/kg	76.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	8 mg/kg	80.5	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666311)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	110	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667471)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	106	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	102	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	85.5	72.6	117
EP080: BTEX (QCLot: 1666311)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	82.1	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	88.7	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	94.4	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	103	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	95.9	63	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 1665852)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	85	111
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	88	108
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	92	114
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	106	89	115
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	108	91	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	91	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	78	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667184)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	116	81	119
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1666061)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	79.6	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	84.9	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	80.6	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	86.1	63.9	115
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1666061) - continued								
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	87.1	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	83.2	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	93.2	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	95.8	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	104	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	92.1	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	101	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	89.5	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	90.9	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	90.1	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	89.7	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	90.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666060)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	60.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	80.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	80.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666132)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	89.2	75	127
EP080: BTEX (QCLot: 1666132)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	99.1	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	95.5	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	98.3	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	102	73	121

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: 1667090)							
ES1102671-073	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	101	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	103	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	109	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	103	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	104	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1667092)							
ES1102875-006	BH404_15-15.4	EG005T: Arsenic	7440-38-2	50 mg/kg	95.4	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.5	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	107	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	97.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667091)							
ES1102671-073	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	110	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667093)							
ES1102875-006	BH404_15-15.4	EG035T: Mercury	7439-97-6	5 mg/kg	103	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667472)							
ES1102875-001	BH404_0.4-0.5	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	115	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	77.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666311)							
ES1102875-001	BH404_0.4-0.5	EP080: C6 - C9 Fraction	----	26 mg/kg	88.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667471)							
ES1102875-001	BH404_0.4-0.5	EP071: C10 - C14 Fraction	----	640 mg/kg	107	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	73.1	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	78.9	70	130
EP080: BTEX (QCLot: 1666311)							
ES1102875-001	BH404_0.4-0.5	EP080: Benzene	71-43-2	2.5 mg/kg	79.4	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	88.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.1	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	94.6	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
EP080: BTEX (QCLot: 1666311) - continued							
ES1102875-001	BH404_0.4-0.5	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.9	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
EG020T: Total Metals by ICP-MS (QCLot: 1665852)							
ES1102904-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	103	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	103	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	98.0	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	97.2	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.0	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	107	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667184)							
ES1102875-008	QC655	EG035T: Mercury	7439-97-6	0.010 mg/L	118	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1666061)							
ES1102834-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	2 µg/L	74.6	70	130
		EP075(SIM): Pyrene	129-00-0	2 µg/L	75.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666060)							
ES1102834-002	Anonymous	EP071: C10 - C14 Fraction	----	20 µg/L	120	70	130
		EP071: C15 - C28 Fraction	----	20 µg/L	130	70	130
		EP071: C29 - C36 Fraction	----	20 µg/L	120	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1666132)							
ES1102834-002	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	81.9	70	130
EP080: BTEX (QCLot: 1666132)							
ES1102834-002	Anonymous	EP080: Benzene	71-43-2	25 µg/L	91.8	70	130
		EP080: Toluene	108-88-3	25 µg/L	95.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	79.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	86.6	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.6	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1102875**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 09-FEB-2011
Sampler	: LK/KO	Issue Date	: 17-FEB-2011
Order number	: 39540AUS	No. of samples received	: 39
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**----**	----	----	**14-FEB-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**----**	----	----	**14-FEB-2011**	23-FEB-2011	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag							
BH404_0.4-0.5, BH406_7.0-7.2	**08-FEB-2011**	**---**	07-AUG-2011	----	**16-FEB-2011**	15-AUG-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**13-FEB-2011**	07-AUG-2011	✓	**14-FEB-2011**	07-AUG-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**13-FEB-2011**	08-AUG-2011	✓	**14-FEB-2011**	08-AUG-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
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**13-FEB-2011**	08-MAR-2011	✓	**14-FEB-2011**	08-MAR-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**13-FEB-2011**	09-MAR-2011	✓	**14-FEB-2011**	09-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**14-FEB-2011**	22-FEB-2011	✓	**14-FEB-2011**	26-MAR-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**14-FEB-2011**	26-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**11-FEB-2011**	22-FEB-2011	✓	**13-FEB-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**14-FEB-2011**	22-FEB-2011	✓	**14-FEB-2011**	26-MAR-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**11-FEB-2011**	23-FEB-2011	✓	**13-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH406_16.0-16.5	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**14-FEB-2011**	26-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 BH404_0.4-0.5, BH404_4.0-4.4, BH404_7.0-7.4, BH404_12-12.4, BH404_14-14.4, BH404_15-15.4, QC653, BH406_4.0-4.2, BH406_7.0-7.2, BH406_10.0-10.3, BH406_14.0-14.4, BH406_15.0-15.4, QC602	**08-FEB-2011**	**11-FEB-2011**	22-FEB-2011	✓	**13-FEB-2011**	22-FEB-2011	✓
Soil Glass Jar - Unpreserved BH406_16.0-16.5	**09-FEB-2011**	**11-FEB-2011**	23-FEB-2011	✓	**13-FEB-2011**	23-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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unspecified QC655	**08-FEB-2011**	**11-FEB-2011**	07-AUG-2011	✓	**11-FEB-2011**	07-AUG-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unspecified QC655	**08-FEB-2011**	**----**	----	----	**13-FEB-2011**	08-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC655	**08-FEB-2011**	**11-FEB-2011**	15-FEB-2011	✓	**12-FEB-2011**	23-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved QC655	**08-FEB-2011**	**11-FEB-2011**	15-FEB-2011	✓	**12-FEB-2011**	23-MAR-2011	✓
Amber VOC Vial - HCl QC655	**08-FEB-2011**	**11-FEB-2011**	22-FEB-2011	✓	**11-FEB-2011**	22-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl QC655	**08-FEB-2011**	**11-FEB-2011**	22-FEB-2011	✓	**11-FEB-2011**	22-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	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	35	**11.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	**10.0**	**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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	**5.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**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	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	35	**5.7**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	39	**5.1**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	14	**7.1**	**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)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	12	**16.7**	**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-MS - Suite A	EG020A-T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**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)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	**8.3**	**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-MS - Suite A	EG020A-T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	**8.3**	**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-MS - Suite A	EG020A-T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**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)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	8	**12.5**	**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).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
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)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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 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	1958617-007	----	**Naphthalene**	91-20-3	81.2 %	81.9-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1958617-007	----	**Phenanthrene**	85-01-8	77.9 %	79.4-114%	**Recovery less than lower control limit**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Matrix Spike 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	ES1102875-015	BH406_16.0-16.5	**4-Bromofluorobenzene**	460-00-4	131 %	71.6-130.0 %	**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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1102973**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 10-FEB-2011
Sampler	: LK/KO	Issue Date	: 23-FEB-2011
Site	: ----		
		No. of samples received	: 37
Quote number	: SY/418/10 V2	No. of samples analysed	: 16

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control 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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **'Am' Amosite (brown asbestos)**
- **'Ch' Chrysotile (white asbestos)**
- **'Cr' Crocidolite (blue asbestos)**
- **Legend for Asbestos Type:**
- **'t' Trace levels**
- **'UMF' Unknown mineral fibres**
- **Asbestos Identification: Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **Confirmation by alternative techniques is recommended for samples where unknown mineral fibres are detected. Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP071: The result for sample ES1102973_006;013&014 was confirmed by re-extraction and re-analysis.**
- **EP080: Level of Reporting raised for toluene due to ambient background levels in the laboratory.**
- **EPO75(SIM) : Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_4.0-4.4	BH403_8.0-8.4	BH403_12-12.4	BH403_16-16.4	BH403_17-17.3
				Client sampling date / time: 09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00
				ES1102973-001	ES1102973-002	ES1102973-003	ES1102973-004	ES1102973-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	14.6	38.7	14.4	13.4	16.4
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	132207-33-1	0.1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	91.4	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	16	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	30	42	7	18	11
Copper	7440-50-8	5	mg/kg	40	156	<5	<5	<5
Lead	7439-92-1	5	mg/kg	182	289	8	11	10
Nickel	7440-02-0	2	mg/kg	39	20	3	3	<2
Zinc	7440-66-6	5	mg/kg	129	404	10	8	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	8.3	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	23.7	146	1160	941	441
Acenaphthylene	208-96-8	0.5	mg/kg	<4.0	48.2	214	200	57.0
Acenaphthene	83-32-9	0.5	mg/kg	6.0	37.4	31.4	31.9	12.0
Fluorene	86-73-7	0.5	mg/kg	<4.0	95.0	251	192	80.9
Phenanthrene	85-01-8	0.5	mg/kg	7.8	267	480	420	160
Anthracene	120-12-7	0.5	mg/kg	<4.0	98.0	157	170	58.6
Fluoranthene	206-44-0	0.5	mg/kg	4.9	227	253	280	114
Pyrene	129-00-0	0.5	mg/kg	<4.0	186	214	248	92.4
Benz(a)anthracene	56-55-3	0.5	mg/kg	<4.0	112	120	115	39.7
Chrysene	218-01-9	0.5	mg/kg	<4.0	77.6	91.2	86.4	29.1
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<4.0	84.9	87.6	93.0	30.6
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<4.0	34.4	40.0	34.2	13.6
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<4.0	70.5	60.9	68.4	27.2
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<4.0	24.4	22.1	22.6	8.9
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<4.0	7.3	6.2	6.8	<4.0
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<4.0	27.5	26.6	25.5	9.7
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	31	651	434	13
C10 - C14 Fraction	----	50	mg/kg	220	1300	7080	5540	1800
C15 - C28 Fraction	----	100	mg/kg	1340	8870	11200	9740	3290

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_4.0-4.4	BH403_8.0-8.4	BH403_12-12.4	BH403_16-16.4	BH403_17-17.3
				Client sampling date / time: 09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00
				ES1102973-001	ES1102973-002	ES1102973-003	ES1102973-004	ES1102973-005
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	**1760**	**3600**	**3460**	**2900**	**980**
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**3320**	**13800**	**21700**	**18200**	**6070**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	**4.2**	**124**	**60.0**	**1.5**
Toluene	108-88-3	0.5	mg/kg	<0.5	**5.0**	**145**	**117**	**2.9**
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	**4.3**	**10.2**	**8.7**	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	**6.6**	**131**	**116**	**3.3**
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	**3.6**	**48.2**	**41.3**	**1.1**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**106**	**107**	**48.5**	**87.4**	**83.4**
2-Chlorophenol-D4	93951-73-6	0.1	%	**102**	**104**	**73.0**	**81.5**	**85.1**
2.4.6-Tribromophenol	118-79-6	0.1	%	**59.6**	**98.1**	**66.6**	**68.9**	**61.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**67.2**	**80.8**	**78.5**	**81.4**	**77.8**
Anthracene-d10	1719-06-8	0.1	%	**80.1**	**97.0**	**103**	**91.6**	**85.8**
4-Terphenyl-d14	1718-51-0	0.1	%	**109**	**91.6**	**111**	**114**	**108**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**118**	**112**	**121**	**112**	**117**
Toluene-D8	2037-26-5	0.1	%	**104**	**113**	**103**	**109**	**122**
4-Bromofluorobenzene	460-00-4	0.1	%	**111**	**106**	**101**	**106**	**116**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	QC656	TB01	BH402_4.0-4.2	BH402_9.0-9.3	BH402_11.0-11.2
Client sample ID				QC656	TB01	BH402_4.0-4.2	BH402_9.0-9.3	BH402_11.0-11.2
Client sampling date / time				09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00
				ES1102973-006	ES1102973-008	ES1102973-009	ES1102973-010	ES1102973-011
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	43.7	----	----	19.7	16.9
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	No	----	----
Asbestos Type	132207-33-1	0.1	--	----	----	-	----	----
Sample weight (dry)	----	0.01	g	----	----	325	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	P.RENNIE	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	21	----	----	16	<5
Cadmium	7440-43-9	1	mg/kg	1	----	----	3	<1
Chromium	7440-47-3	2	mg/kg	34	----	----	28	9
Copper	7440-50-8	5	mg/kg	184	----	----	716	64
Lead	7439-92-1	5	mg/kg	379	----	----	1500	86
Nickel	7440-02-0	2	mg/kg	18	----	----	19	5
Zinc	7440-66-6	5	mg/kg	467	----	----	3780	99
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	7.2	----	----	4.1	0.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	8.3	----	----	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	20.2	----	----	0.6	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	6.6	----	----	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	8.7	----	----	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	49.9	----	----	3.4	0.5
Anthracene	120-12-7	0.5	mg/kg	19.8	----	----	1.1	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	96.9	----	----	4.6	0.9
Pyrene	129-00-0	0.5	mg/kg	114	----	----	4.4	0.9
Benz(a)anthracene	56-55-3	0.5	mg/kg	46.8	----	----	2.7	<0.5
Chrysene	218-01-9	0.5	mg/kg	34.3	----	----	2.1	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	41.7	----	----	2.6	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	18.0	----	----	1.2	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	36.8	----	----	2.3	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	14.6	----	----	1.2	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	4.1	----	----	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	18.6	----	----	1.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	15	<10	----	<10	<10
C10 - C14 Fraction	----	50	mg/kg	320	----	----	<50	<50
C15 - C28 Fraction	----	100	mg/kg	5480	----	----	650	<100

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: QC656	TB01	BH402_4.0-4.2	BH402_9.0-9.3	BH402_11.0-11.2
				Client sampling date / time: 09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00
				ES1102973-006	ES1102973-008	ES1102973-009	ES1102973-010	ES1102973-011
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	**2920**	----	----	**210**	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**8720**	----	----	**860**	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**3.5**	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	**0.9**	<0.5	----	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	**2.4**	<0.5	----	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**1.9**	<0.5	----	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	**1.2**	<0.5	----	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**96.2**	----	----	**107**	**112**
2-Chlorophenol-D4	93951-73-6	0.1	%	**78.6**	----	----	**111**	**107**
2.4.6-Tribromophenol	118-79-6	0.1	%	**52.8**	----	----	**96.9**	**66.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**91.5**	----	----	**97.8**	**94.2**
Anthracene-d10	1719-06-8	0.1	%	**92.3**	----	----	**100**	**102**
4-Terphenyl-d14	1718-51-0	0.1	%	**88.0**	----	----	**115**	**117**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**109**	**116**	----	**120**	**113**
Toluene-D8	2037-26-5	0.1	%	**109**	**110**	----	**120**	**117**
4-Bromofluorobenzene	460-00-4	0.1	%	**100**	**116**	----	**116**	**103**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH402_14.0-14.5	BH402_17.0-17.4	QC606	BH402_19.1-19.4	BH403_2.0-2.4
				Client sampling date / time	09-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	09-FEB-2011 15:00
Compound	CAS Number	LOR	Unit		ES1102973-012	ES1102973-013	ES1102973-014	ES1102973-015	ES1102973-017
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		14.2	16.1	16.4	23.1	27.4
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		10	7	13	8	17
Copper	7440-50-8	5	mg/kg		<5	<5	5	<5	32
Lead	7439-92-1	5	mg/kg		9	8	7	31	31
Nickel	7440-02-0	2	mg/kg		2	2	3	<2	12
Zinc	7440-66-6	5	mg/kg		12	7	11	8	31
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		168	957	457	27.6	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		28.4	220	115	6.2	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		4.3	27.7	14.3	<4.0	<0.5
Fluorene	86-73-7	0.5	mg/kg		28.5	169	89.2	5.1	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		69.7	417	220	12.7	3.0
Anthracene	120-12-7	0.5	mg/kg		24.8	158	78.8	4.4	0.8
Fluoranthene	206-44-0	0.5	mg/kg		43.1	278	145	7.7	3.2
Pyrene	129-00-0	0.5	mg/kg		38.1	251	131	6.8	3.1
Benz(a)anthracene	56-55-3	0.5	mg/kg		16.7	93.3	53.9	<4.0	1.5
Chrysene	218-01-9	0.5	mg/kg		11.9	73.8	40.4	<4.0	1.3
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		10.5	65.2	34.7	<4.0	1.0
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		4.3	23.0	17.0	<4.0	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		11.0	69.6	36.6	<4.0	1.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<4.0	24.8	12.8	<4.0	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<4.0	7.4	<4.0	<4.0	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		4.6	30.4	15.8	<4.0	0.6
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		66	470	221	15	<10
C10 - C14 Fraction	----	50	mg/kg		690	3060	2350	180	<50
C15 - C28 Fraction	----	100	mg/kg		1560	4860	4900	250	<100
C29 - C36 Fraction	----	100	mg/kg		660	1470	1500	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		2910	9390	8750	430	<50
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		6.2	63.4	32.0	2.9	<0.2
Toluene	108-88-3	0.5	mg/kg		15.7	127	57.9	3.3	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH402_14.0-14.5	BH402_17.0-17.4	QC606	BH402_19.1-19.4	BH403_2.0-2.4
				Client sampling date / time: 09-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	09-FEB-2011 15:00
				ES1102973-012	ES1102973-013	ES1102973-014	ES1102973-015	ES1102973-017
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	**1.5**	**9.0**	**4.1**	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**20.4**	**128**	**60.0**	**2.6**	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	**7.4**	**46.1**	**21.5**	**1.0**	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**97.3**	**96.6**	**86.2**	**86.3**	**114**
2-Chlorophenol-D4	93951-73-6	0.1	%	**86.7**	**87.9**	**79.4**	**78.2**	**104**
2.4.6-Tribromophenol	118-79-6	0.1	%	**51.4**	**54.4**	**52.3**	**47.9**	**58.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**96.6**	**89.2**	**88.3**	**85.9**	**107**
Anthracene-d10	1719-06-8	0.1	%	**91.8**	**85.2**	**83.6**	**86.2**	**110**
4-Terphenyl-d14	1718-51-0	0.1	%	**96.5**	**87.1**	**87.3**	**85.3**	**124**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**113**	**118**	**110**	**90.9**	**97.5**
Toluene-D8	2037-26-5	0.1	%	**110**	**110**	**99.8**	**97.2**	**111**
4-Bromofluorobenzene	460-00-4	0.1	%	**100**	**97.2**	**93.5**	**94.3**	**111**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC662	----	----	----	----
				Client sampling date / time: 09-FEB-2011 15:00	----	----	----	----
				ES1102973-007	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**91.8**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**96.3**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	BH403_4.0-4.4 - 09-FEB-2011 15:00	Grey brown soil with some vegetation and small coal like pieces with several medium sized grey rocks
EA200: Description	BH402_4.0-4.2 - 09-FEB-2011 15:00	Grey brown fine grained soil with some vegetation and several large grey rocks and some small red brown and grey rocks plus some small coal pieces

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

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Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications: ESDAT

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email: _____	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: Metals (8)	PAH	TPH / BTEX	Asbestos	Hotel	Other
(16)	BH403_3.0-3.4	9.2.11		X					X	/	150ml						
(17)	BH403_2.0-2.4										11						
1	BH403_4.0-4.4										250ml	X	X	X	X		
(18)	BH403_5.0-5.4										250ml						
(19)	BH403_6.0-6.4										150ml						
2	BH403_8.0-8.4										250ml	X	X	X			
(20)	BH403_9.0-9.4										250ml						
(21)	BH403_10-10.4										11						
(22)	BH403_11-11.4										150ml						
3	BH403_12-12.4										250ml	X	X	X			
(23)	BH403_13-13.4										150ml						
(24)	BH403_14-14.4										250ml						
(25)	BH403_15-15.4										250ml						
4	BH403_16-16.4	↓		↓					↓		11	X	X	X			↓

Analysis / Forward Lab / Split
Analysis: Lab Work
Received By / Date: Asbestos / Nevcash
Relinquished By / Date:
Courier / Courier
No:
Batch By PC / Internal Sheet:

Environmental Division Sydney
Work Order
ES1102973
Telephone : +61-2-8784 8555

High PID readings 7200 ppm

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No. | Esky ID

Relinquished by: Lauren Kontus/Kate O'Brien Signed: 16/2/11 Date: 16/2/2010
Recieved by: Signed: Date:

Relinquished by: Signed: Date:
Recieved by: Signed: Date: 10-2

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BMS-PM-DV-F046
Revision: Jun 08

COC

Chain of Custody

COC #3 page 2/4

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Contact Name:
Lab Quote No: SY/418/10 V2
Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Metals (8)	PAH	TPH/BTEX	TPH C6-C9/BTEX	Asbestos	HOLD	Other
5	BH403_17-17.3	9-2-11		X							150ml	X	X	X				High PID reading
6	QC656	↓		X							↓	X	X	X				
26	QC657			X													X	
27	QC658			X													X	
28	QC660			X													X	
7	QC662	↓			X						*	X	X	X				
8	TB01	9-2-11		X							150ml				X			

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * 2x vials

Relinquished by: Lauren Kontus / Kate O'Brien
Signed: [signature] 10/2/11
Date: 10/2/2011

Recieved by:
Signed:
Date:

Relinquished by:
Signed:
Date:

Recieved by: [signature]
Signed: AUS
Date: 10-2-11

Lab Report No.
Esky ID

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Page 1 of 1

BMS-PM-DV-F046
Revision: Jun 08

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COC #3 Page 3/4

Chain of Custody

AECOM

AECOM - Sydney	
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999
	Fax: 61 2 8484 8989
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1

Laboratory Details

Lab. Name: ALS	Tel: 8784 8555
Lab. Address:277 Woodpark Road, Smithfield NSW 2164	Fax:
	Preliminary Report by:
Contact Name:	Final Report by:
	Lab Quote No: **SY/418/10 V2**
Project Name: Barangaroo VMP DGI	PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: HOLD	METALS (8)	TPH/BTEX	PAH	ASBESTOS	Other
9	BH402_4.0-4.2	9-2-10	—	X					X		1x zip lock bag					X	
(29)	BH402_5.0-5.2	9-2-10	—	X					X		1x 150mL jar						
(30)	BH402_8.0-8.2	9-2-10	—	X					X		"						
~~31~~ 10	BH402_9.0-9.3	9-2-10	—	X					X		1x 150ml jar 1x zip bag		X	X	X		
~~31~~ (31)	BH402_10.0-10.2	9-2-10	—	X					X		1x 150ml jar						
11	BH402_11.0-11.2	9-2-10	—	X					X		"		X	X	X		
(32)	BH402_12.0-12.1	9-2-10	—	X					X		"						
(33)	BH402_13.0-13.2	9-2-10	—	X					X		"						High PID reading 7200ppm
12	BH402_14.0-14.5	9-2-10	—	X					X		"		X	X	X		
(34)	BH402_15.0-15.5	9-2-10	—	X					X		250ml						
(35)	BH402_16.0-16.3	10-2-10	—	X					X		"						
13	BH402_17.0-17.4	10-2-10	—	X					X		150ml		X	X	X		
14	QC606	10-2-11	—	X					X		"		X	X	X		
(36)	QC604	9-2-10	—	X					X		150ml						

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus / Kate O'Brien Signed: 10/2/11 Date: 10/2/2010

Recieved by: Signed: Date:

Relinquished by: Signed: Date: 5-6

Recieved by: Signed: Date: 10-2-11

COC # 3 Page 4/4

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	METALS (8)	PAH	ASBESTOS	Other
(37)	BH402_18-1-183	10-2-11	–	X					X		250ml						
15	BH402_19-1-194	10-2-11	–	X					X		250ml		X	X	X		1.4ppm PID reading

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus / Kate O'Brien Signed: Date: 5/10/11

Recieved by: Signed: Date:

Relinquished by: Signed: Date:

Recieved by: Signed: Date: 10-2-11

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1102973**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 4
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 10-FEB-2011	Issue Date	: 18-FEB-2011 09:13
Client Requested Due Date	: 21-FEB-2011	Scheduled Reporting Date	: **21-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.6'C
No. of coolers/boxes	: ----	No. of samples received	: 37
Security Seal	: Intact.	No. of samples analysed	: 16

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.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Samples QC659, QC661, QC605, QC607 to be forwarded to Labmark.**
- **Analysis added to sample BH403_2.0 -.2.4 as per Kate O'Brien 17/2/11**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EA200 Asbestos Identification in Soils	SOIL - S-18 (NO MOIST) TPH(C6-C9)/BTEX with No Moisture for TBs	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1102973-001	09-FEB-2011 15:00	BH403_4.0-4.4		✓		✓
ES1102973-002	09-FEB-2011 15:00	BH403_8.0-8.4				✓
ES1102973-003	09-FEB-2011 15:00	BH403_12-12.4				✓
ES1102973-004	09-FEB-2011 15:00	BH403_16-16.4				✓
ES1102973-005	09-FEB-2011 15:00	BH403_17-17.3				✓
ES1102973-006	09-FEB-2011 15:00	QC656				✓
ES1102973-008	09-FEB-2011 15:00	TB01			✓	
ES1102973-009	09-FEB-2011 15:00	BH402_4.0-4.2		✓		
ES1102973-010	09-FEB-2011 15:00	BH402_9.0-9.3				✓
ES1102973-011	09-FEB-2011 15:00	BH402_11.0-11.2				✓
ES1102973-012	09-FEB-2011 15:00	BH402_14.0-14.5				✓
ES1102973-013	10-FEB-2011 15:00	BH402_17.0-17.4				✓
ES1102973-014	10-FEB-2011 15:00	QC606				✓
ES1102973-015	10-FEB-2011 15:00	BH402_19.1-19.4				✓
ES1102973-016	09-FEB-2011 15:00	BH403_3.0-3.4	✓			
ES1102973-017	09-FEB-2011 15:00	BH403_2.0-2.4				✓
ES1102973-018	09-FEB-2011 15:00	BH403_5.0-5.4	✓			
ES1102973-019	09-FEB-2011 15:00	BH403_6.0-6.4	✓			
ES1102973-020	09-FEB-2011 15:00	BH403_9.0-9.4	✓			
ES1102973-021	09-FEB-2011 15:00	BH403_10-10.4	✓			
ES1102973-022	09-FEB-2011 15:00	BH403_11-11.4	✓			
ES1102973-023	09-FEB-2011 15:00	BH403_13-13.4	✓			
ES1102973-024	09-FEB-2011 15:00	BH403_14-14.4	✓			
ES1102973-025	09-FEB-2011 15:00	BH403_15-15.4	✓			
ES1102973-026	09-FEB-2011 15:00	QC657	✓			
ES1102973-027	09-FEB-2011 15:00	QC658	✓			
ES1102973-028	09-FEB-2011 15:00	QC660	✓			
ES1102973-029	09-FEB-2011 15:00	BH402_5.0-5.2	✓			
ES1102973-030	09-FEB-2011 15:00	BH402_8.0-8.2	✓			
ES1102973-031	09-FEB-2011 15:00	BH402_10.0-10.2	✓			
ES1102973-032	09-FEB-2011 15:00	BH402_12.0-12.1	✓			
ES1102973-033	09-FEB-2011 15:00	BH402_13.0-13.2	✓			
ES1102973-034	09-FEB-2011 15:00	BH402_15.0-15.5	✓			
ES1102973-035	10-FEB-2011 15:00	BH402_16.0-16.3	✓			
ES1102973-036	09-FEB-2011 15:00	QC604	✓			

			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils	SOIL - S-18 (NO MOIST) TPH(C6-C9)/BTEX with No Moisture for TBs	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1102973-037	10-FEB-2011 15:00	BH402_18.1-18.3	✓			

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-05T TPH/BTEX/8 Metals (Total)
ES1102973-007	09-FEB-2011 15:00	QC662	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1102973**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 10-FEB-2011
Sampler	: LK/KO	Issue Date	: 23-FEB-2011
Order number	: 39540AUS		
		No. of samples received	: 37
Quote number	: SY/418/10 V2	No. of samples analysed	: 16

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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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: 1668490)									
ES1102883-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	26.5	27.1	2.5	0% - 20%
ES1102973-006	QC656	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	43.7	43.3	0.8	0% - 20%
EA055: Moisture Content (QC Lot: 1675396)									
ES1102875-027	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.7	7.7	0.0	No Limit
ES1103302-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	60.5	60.6	0.0	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1671528)									
ES1102973-001	BH403_4.0-4.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	30	28	10.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	39	27	36.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	40	22	57.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	182	161	12.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	129	135	4.8	0% - 20%
ES1102973-014	QC606	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	7	62.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	<2	42.2	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	6	17.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	11	8	33.9	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1676247)									
ES1102973-017	BH403_2.0-2.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	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	32	21	40.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	31	35	13.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	30	4.6	No Limit
ES1103336-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	20	25.2	0% - 50%
		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	6	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	6	29.0	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 (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1671529)									
ES1102973-001	BH403_4.0-4.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1102973-014	QC606	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: 1676248)									
ES1102973-017	BH403_2.0-2.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
ES1103336-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1667220)									
ES1102291-001	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
ES1102973-003	BH403_12-12.4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	1160	1090	6.5	0% - 20%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	214	216	0.6	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	31.4	29.3	6.7	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	251	244	2.6	0% - 20%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	480	506	5.3	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	157	157	0.3	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	253	244	3.8	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	214	208	2.8	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	120	120	0.3	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	91.2	90.3	1.0	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	87.6	88.6	1.0	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	40.0	41.2	3.0	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	60.9	62.5	2.6	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	22.1	22.8	3.2	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	6.2	6.9	10.2	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	26.6	27.3	2.5	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1674753)									

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: 1674753) - continued									
ES1102875-027	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	1.8	<0.5	113	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	39.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.2	1.1	68.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.3	1.1	71.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.8	0.7	85.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.5	0.6	86.3	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.7	0.7	81.8	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	<0.5	49.8	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.6	0.6	82.2	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.8	<0.5	44.4	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	1.0	<0.5	66.4	No Limit
ES1103136-042	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667206)									
ES1102291-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1102973-003	BH403_12-12.4	EP080: C6 - C9 Fraction	----	10	mg/kg	651	632	3.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667207)									
ES1102992-018	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1102992-027	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667219)									

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: 1667219) - continued									
ES1102291-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	2880	3010	4.4	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1800	1800	0.0	0% - 50%
		EP071: C10 - C14 Fraction	----	50	mg/kg	240	240	0.0	No Limit
ES1102973-003	BH403_12-12.4	EP071: C15 - C28 Fraction	----	100	mg/kg	11200	10300	8.7	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	3460	3150	9.4	0% - 20%
		EP071: C10 - C14 Fraction	----	50	mg/kg	7080	6900	2.6	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674546)									
ES1102875-027	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674752)									
ES1102875-027	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
ES1103136-042	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: 1667206)									
ES1102291-001	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
ES1102973-003	BH403_12-12.4	EP080: Benzene	71-43-2	0.2	mg/kg	124	125	1.4	0% - 20%
		EP080: Toluene	108-88-3	0.5	mg/kg	145	158	8.3	0% - 20%
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	10.2	11.0	7.6	0% - 20%
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	131	135	3.3	0% - 20%
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	48.2	49.2	2.2	0% - 20%
EP080: BTEX (QC Lot: 1667207)									
ES1102992-018	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
ES1102992-027	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

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: BTEX (QC Lot: 1667207) - continued									
ES1102992-027	Anonymous	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: 1674546)									
ES1102875-027	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 (%)
EG020T: Total Metals by ICP-MS (QC Lot: 1667274)									
EN1100362-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	20.8	20.8	0.2	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.008	0.007	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.041	0.045	8.8	No Limit
ES1102804-012	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.010	0.009	14.5	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1667184)									
ES1102806-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1102937-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667153)									
ES1102830-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1102962-008	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1667153)									
ES1102830-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEX (QC Lot: 1667153) - continued									
ES1102830-001	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1102962-008	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
EG005T: Total Metals by ICP-AES (QCLot: 1671528)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	127	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	97.8	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	110	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	105	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	107	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	116	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	100	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1676247)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	114	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	95.1	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	103	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	102	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	98.1	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	105	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	92.6	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671529)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	112	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	80.6	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667220)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	97.8	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	102	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	102	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	100	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	104	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	109	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	108	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	109	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	101	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	108	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	90.3	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	108	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	101	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	79.8	71	113

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: 1667220) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	83.3	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	79.6	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	109	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	# 112	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	111	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	# 114	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	# 117	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	107	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	113	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	95.2	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	105	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	105	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	102	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667206)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	91.5	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667207)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	92.8	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667219)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	108	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	101	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	94.3	72.6	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674546)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	110	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	98.1	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.8	72.6	117
EP080: BTEX (QCLot: 1667206)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.8	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.2	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	86.3	61	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEX (QCLot: 1667206) - continued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.6	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	90.0	63	117
EP080: BTEX (QCLot: 1667207)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	81.0	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	81.2	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	82.9	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	88.1	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	85.4	63	117
EP080: BTEX (QCLot: 1674546)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.6	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.6	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	106	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	63	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 1667274)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	85	111
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	102	88	108
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	92	114
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	89	115
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	106	91	113
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	100	91	113
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	78	116
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667184)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	116	81	119
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667153)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	100	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667866)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	77.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	96.0	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	91.5	62.7	131
EP080: BTEX (QCLot: 1667153)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	104	70	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
EP080: BTEX (QCLot: 1667153) - continued								
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	107	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.6	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	102	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.8	73	121

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: 1671528)							
ES1102973-001	BH403_4.0-4.4	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.7	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	75.7	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	73.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	71.9	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	112	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1676247)							
ES1102973-017	BH403_2.0-2.4	EG005T: Arsenic	7440-38-2	50 mg/kg	101	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.3	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.9	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671529)							
ES1102973-001	BH403_4.0-4.4	EG035T: Mercury	7439-97-6	5 mg/kg	112	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)							
ES1102973-017	BH403_2.0-2.4	EG035T: Mercury	7439-97-6	5 mg/kg	99.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667220)							
ES1102291-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	83.2	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)							
ES1102875-027	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	122	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667206)							
ES1102291-001	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	73.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667207)							
ES1102992-018	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667219)							
ES1102291-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	93.6	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	84.3	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	87.7	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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674546)							
ES1102875-027	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	83.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)							
ES1102875-027	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	100	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	87.6	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.3	70	130
EP080: BTEX (QCLot: 1667206)							
ES1102291-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	79.5	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	79.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	82.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.5	70	130
EP080: BTEX (QCLot: 1667207)							
ES1102992-018	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.9	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	84.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	82.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	83.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	80.0	70	130
EP080: BTEX (QCLot: 1674546)							
ES1102875-027	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	85.4	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.8	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.1	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
EG020T: Total Metals by ICP-MS (QCLot: 1667274)							
EN1100362-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	100	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	102	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	95.2	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	# Not Determined	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	91.2	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	101	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	100	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
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1667184)							
ES1102875-008	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	118	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667153)							
ES1102830-001	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	97.1	70	130
EP080: BTEX (QCLot: 1667153)							
ES1102830-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	93.0	70	130
		EP080: Toluene	108-88-3	25 µg/L	93.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	97.9	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.9	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1102973**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 10-FEB-2011
Sampler	: LK/KO	Issue Date	: 23-FEB-2011
Order number	: 39540AUS		
		No. of samples received	: 37
Quote number	: SY/418/10 V2	No. of samples analysed	: 16

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 BH403_4.0-4.4, BH403_8.0-8.4, BH403_12-12.4, BH403_16-16.4, BH403_17-17.3, QC656, BH402_9.0-9.3, BH402_11.0-11.2, BH402_14.0-14.5	**09-FEB-2011**	**----**	----	----	**14-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved BH403_2.0-2.4	**09-FEB-2011**	**----**	----	----	**18-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved BH402_17.0-17.4, QC606, BH402_19.1-19.4	**10-FEB-2011**	**----**	----	----	**14-FEB-2011**	24-FEB-2011	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag BH403_4.0-4.4, BH402_4.0-4.2	**09-FEB-2011**	**---**	08-AUG-2011	----	**23-FEB-2011**	22-AUG-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved BH403_4.0-4.4, BH403_8.0-8.4, BH403_12-12.4, BH403_16-16.4, BH403_17-17.3, QC656, BH402_9.0-9.3, BH402_11.0-11.2, BH402_14.0-14.5	**09-FEB-2011**	**16-FEB-2011**	08-AUG-2011	✓	**17-FEB-2011**	08-AUG-2011	✓
Soil Glass Jar - Unpreserved BH403_2.0-2.4	**09-FEB-2011**	**20-FEB-2011**	08-AUG-2011	✓	**21-FEB-2011**	08-AUG-2011	✓
Soil Glass Jar - Unpreserved BH402_17.0-17.4, QC606, BH402_19.1-19.4	**10-FEB-2011**	**16-FEB-2011**	09-AUG-2011	✓	**17-FEB-2011**	09-AUG-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
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH403_4.0-4.4,	BH403_8.0-8.4,	**09-FEB-2011**	**16-FEB-2011**	09-MAR-2011	✓	**17-FEB-2011**	09-MAR-2011	✓
BH403_12-12.4,	BH403_16-16.4,							
BH403_17-17.3,	QC656,							
BH402_9.0-9.3,	BH402_11.0-11.2,							
BH402_14.0-14.5								
Soil Glass Jar - Unpreserved								
BH403_2.0-2.4		**09-FEB-2011**	**20-FEB-2011**	09-MAR-2011	✓	**21-FEB-2011**	09-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_17.0-17.4,	QC606,	**10-FEB-2011**	**16-FEB-2011**	10-MAR-2011	✓	**17-FEB-2011**	10-MAR-2011	✓
BH402_19.1-19.4								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH403_4.0-4.4,	BH403_8.0-8.4,	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**16-FEB-2011**	26-MAR-2011	✓
BH403_12-12.4,	BH403_16-16.4,							
BH403_17-17.3,	QC656,							
BH402_9.0-9.3,	BH402_11.0-11.2,							
BH402_14.0-14.5								
Soil Glass Jar - Unpreserved								
BH403_2.0-2.4		**09-FEB-2011**	**18-FEB-2011**	23-FEB-2011	✓	**18-FEB-2011**	30-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_17.0-17.4,	QC606,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**16-FEB-2011**	26-MAR-2011	✓
BH402_19.1-19.4								
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH403_4.0-4.4,	BH403_8.0-8.4,	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**14-FEB-2011**	23-FEB-2011	✓
BH403_12-12.4,	BH403_16-16.4,							
BH403_17-17.3,	QC656,							
TB01,	BH402_9.0-9.3,							
BH402_11.0-11.2,	BH402_14.0-14.5							
Soil Glass Jar - Unpreserved								
BH403_4.0-4.4,	BH403_8.0-8.4,	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH403_12-12.4,	BH403_16-16.4,							
BH403_17-17.3,	QC656,							
BH402_9.0-9.3,	BH402_11.0-11.2,							
BH402_14.0-14.5								
Soil Glass Jar - Unpreserved								
BH403_2.0-2.4		**09-FEB-2011**	**18-FEB-2011**	23-FEB-2011	✓	**18-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved								
BH402_17.0-17.4,	QC606,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**14-FEB-2011**	24-FEB-2011	✓
BH402_19.1-19.4								
Soil Glass Jar - Unpreserved								
BH402_17.0-17.4,	QC606,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH402_19.1-19.4								

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: BTEX							
Soil Glass Jar - Unpreserved BH403_4.0-4.4, BH403_8.0-8.4, BH403_12-12.4, BH403_16-16.4, BH403_17-17.3, QC656, TB01, BH402_9.0-9.3, BH402_11.0-11.2, BH402_14.0-14.5	**09-FEB-2011**	**14-FEB-2011**	23-FEB-2011	✓	**14-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved BH403_2.0-2.4	**09-FEB-2011**	**18-FEB-2011**	23-FEB-2011	✓	**18-FEB-2011**	23-FEB-2011	✓
Soil Glass Jar - Unpreserved BH402_17.0-17.4, QC606, BH402_19.1-19.4	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**14-FEB-2011**	24-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
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unspecified QC662	**09-FEB-2011**	**14-FEB-2011**	08-AUG-2011	✓	**14-FEB-2011**	08-AUG-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unspecified QC662	**09-FEB-2011**	**----**	----	----	**13-FEB-2011**	09-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved QC662	**09-FEB-2011**	**14-FEB-2011**	16-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
Amber VOC Vial - HCl QC662	**09-FEB-2011**	**13-FEB-2011**	23-FEB-2011	✓	**13-FEB-2011**	23-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl QC662	**09-FEB-2011**	**13-FEB-2011**	23-FEB-2011	✓	**13-FEB-2011**	23-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	4	36	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	38	**10.5**	**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	5	47	**10.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	38	**5.3**	**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	3	47	**6.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	38	**5.3**	**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	3	47	**6.4**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	38	**5.3**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
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	3	47	**6.4**	**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)							
Total Mercury by FIMS	EG035T	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.0**	**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)							
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**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)							

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**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)							
Total Mercury by FIMS	EG035T	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.0**	**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).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
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)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH 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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

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)

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.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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 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	1967444-007	----	**Fluorene**	86-73-7	112 %	79.9-112%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Fluoranthene**	206-44-0	114 %	78.8-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Pyrene**	129-00-0	117 %	78.9-113%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020T: Total Metals by ICP-MS	EN1100362-002	Anonymous	**Copper**	7440-50-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate 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							
EP075(SIM)S: Phenolic Compound Surrogates	ES1102973-003	BH403_12-12.4	**Phenol-d6**	13127-88-3	48.5 %	56.3-133.3 %	**Recovery less than lower 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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1103042**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540 AUS		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: LK/KO	Issue Date	: 22-FEB-2011
Site	: ----		
		No. of samples received	: 33
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control 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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **'Am' Amosite (brown asbestos)**
- **'Ch' Chrysotile (white asbestos)**
- **'Cr' Crocidolite (blue asbestos)**
- **Legend for Asbestos Type:**
- **'t' Trace levels**
- **'UMF' Unknown mineral fibres**
- **Asbestos Identification: Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **Confirmation by alternative techniques is recommended for samples where unknown mineral fibres are detected. Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP075(SIM): Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.**
- **EP075(SIM): Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.**
- **EP080: Level of Reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP080: Results for samples QC609 has been confirmed by re-extraction and re-analysis.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH401_3.0-3.4	BH401_5.0-5.4	BH401_13-13.4	BH401_14-14.2	BH401_14-17.4
				Client sampling date / time: 10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00
				ES1103042-001	ES1103042-002	ES1103042-003	ES1103042-004	ES1103042-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	21.6	16.8	19.8	35.2	15.6
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	----	----	----
Asbestos Type	132207-33-1	0.1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	53.7	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	P.RENNIE	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	6	11	30	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	1	<1
Chromium	7440-47-3	2	mg/kg	8	33	11	62	4
Copper	7440-50-8	5	mg/kg	18	9	48	199	<5
Lead	7439-92-1	5	mg/kg	230	462	216	1490	8
Nickel	7440-02-0	2	mg/kg	4	4	8	16	<2
Zinc	7440-66-6	5	mg/kg	143	184	145	813	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.7	0.2	0.7	6.9	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	1.3	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.7	5.4	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.6	0.8	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	1.0	1.3	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	2.5	6.3	9.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	0.8	1.8	5.1	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	3.2	7.5	27.1	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	3.0	7.1	30.2	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.3	3.1	14.6	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.1	2.5	11.0	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	1.6	3.7	16.7	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	0.5	1.3	7.6	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	1.2	2.8	13.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	1.2	5.2	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	1.3	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	0.6	1.5	5.8	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	130	140	1720	<100

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH401_3.0-3.4	BH401_5.0-5.4	BH401_13-13.4	BH401_14-14.2	BH401_14-17.4
				Client sampling date / time: 10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00
				ES1103042-001	ES1103042-002	ES1103042-003	ES1103042-004	ES1103042-005
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	<100	**120**	<100	**1180**	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	**250**	**140**	**2900**	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	**0.2**
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**124**	**127**	**123**	**113**	**96.2**
2-Chlorophenol-D4	93951-73-6	0.1	%	**97.5**	**96.9**	**93.6**	**84.8**	**104**
2.4.6-Tribromophenol	118-79-6	0.1	%	**48.8**	**65.4**	**67.2**	**63.8**	**72.8**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**103**	**101**	**100**	**90.2**	**106**
Anthracene-d10	1719-06-8	0.1	%	**102**	**101**	**100**	**88.7**	**105**
4-Terphenyl-d14	1718-51-0	0.1	%	**98.1**	**97.6**	**98.6**	**74.8**	**100**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**110**	**110**	**114**	**110**
Toluene-D8	2037-26-5	0.1	%	**110**	**107**	**108**	**114**	**110**
4-Bromofluorobenzene	460-00-4	0.1	%	**113**	**108**	**106**	**108**	**111**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH401_19.2-19.4	BH405_4.0-4.3	BH405_7.0-7.3	BH405_12.0-12.2	BH405_13.0-13.2
				Client sampling date / time: 11-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00	11-FEB-2011 15:00
				ES1103042-006	ES1103042-007	ES1103042-008	ES1103042-010	ES1103042-011
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	17.3	14.1	14.1	----	14.3
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	----	Yes	----
Asbestos Type	132207-33-1	0.1	--	----	----	----	Ch	----
Sample weight (dry)	----	0.01	g	----	----	----	181	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	P.RENNIE	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	----	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	----	<1
Chromium	7440-47-3	2	mg/kg	14	7	11	----	<2
Copper	7440-50-8	5	mg/kg	<5	41	<5	----	<5
Lead	7439-92-1	5	mg/kg	7	74	30	----	10
Nickel	7440-02-0	2	mg/kg	<2	4	5	----	<2
Zinc	7440-66-6	5	mg/kg	<5	52	33	----	10
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	----	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	120	<0.5	<0.5	----	208
Acenaphthylene	208-96-8	0.5	mg/kg	30.9	0.9	<0.5	----	45.2
Acenaphthene	83-32-9	0.5	mg/kg	5.0	<0.5	<0.5	----	11.2
Fluorene	86-73-7	0.5	mg/kg	26.0	<0.5	<0.5	----	46.5
Phenanthrene	85-01-8	0.5	mg/kg	61.3	1.4	<0.5	----	130
Anthracene	120-12-7	0.5	mg/kg	19.5	1.2	<0.5	----	40.9
Fluoranthene	206-44-0	0.5	mg/kg	28.4	6.8	<0.5	----	72.9
Pyrene	129-00-0	0.5	mg/kg	28.5	17.1	<0.5	----	63.0
Benz(a)anthracene	56-55-3	0.5	mg/kg	12.9	5.0	<0.5	----	30.2
Chrysene	218-01-9	0.5	mg/kg	9.8	5.0	<0.5	----	23.6
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	10.0	8.0	<0.5	----	25.7
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	3.5	2.4	<0.5	----	14.3
Benzo(a)pyrene	50-32-8	0.5	mg/kg	8.5	5.9	<0.5	----	21.6
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.6	2.2	<0.5	----	7.6
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	0.7	<0.5	<0.5	----	2.0
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	2.8	2.6	<0.5	----	7.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	22	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	470	<50	<50	----	510
C15 - C28 Fraction	----	100	mg/kg	970	400	<100	----	1760

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH401_19.2-19.4	BH405_4.0-4.3	BH405_7.0-7.3	BH405_12.0-12.2	BH405_13.0-13.2
				Client sampling date / time: 11-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00	11-FEB-2011 15:00
				ES1103042-006	ES1103042-007	ES1103042-008	ES1103042-010	ES1103042-011
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	**210**	**620**	<100	----	**560**
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**1650**	**1020**	<50	----	**2830**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**1.4**	<0.2	<0.2	----	**0.7**
Toluene	108-88-3	0.5	mg/kg	**5.9**	<0.5	<0.5	----	**0.6**
Ethylbenzene	100-41-4	0.5	mg/kg	**0.7**	<0.5	<0.5	----	**0.6**
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**7.2**	<0.5	<0.5	----	**3.0**
ortho-Xylene	95-47-6	0.5	mg/kg	**2.9**	<0.5	<0.5	----	**1.3**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**117**	**120**	**116**	----	**116**
2-Chlorophenol-D4	93951-73-6	0.1	%	**87.7**	**94.1**	**93.8**	----	**94.3**
2.4.6-Tribromophenol	118-79-6	0.1	%	**61.9**	**68.2**	**62.8**	----	**67.3**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**89.7**	**99.3**	**100**	----	**100**
Anthracene-d10	1719-06-8	0.1	%	**88.6**	**98.1**	**98.7**	----	**95.6**
4-Terphenyl-d14	1718-51-0	0.1	%	**88.8**	**88.1**	**91.4**	----	**94.1**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**108**	**115**	**114**	----	**118**
Toluene-D8	2037-26-5	0.1	%	**113**	**120**	**110**	----	**124**
4-Bromofluorobenzene	460-00-4	0.1	%	**112**	**120**	**106**	----	**118**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH405_14.0-14.4	QC609	BH401_9.0-9.4	BH401_11-11.4	----
				Client sampling date / time: 11-FEB-2011 15:00	11-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	----
				ES1103042-012	ES1103042-013	ES1103042-020	ES1103042-022	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	17.8	16.4	----	12.3	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	----	----	Yes	----	----
Asbestos Type	132207-33-1	0.1	--	----	----	Ch	----	----
Sample weight (dry)	----	0.01	g	----	----	340	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	P.RENNIE	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	<5	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	4	9	----	10	----
Copper	7440-50-8	5	mg/kg	<5	<5	----	18	----
Lead	7439-92-1	5	mg/kg	20	20	----	59	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	8	----
Zinc	7440-66-6	5	mg/kg	<5	7	----	29	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	<0.1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	1040	1010	----	0.8	----
Acenaphthylene	208-96-8	0.5	mg/kg	221	213	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	44.9	43.2	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	236	208	----	0.6	----
Phenanthrene	85-01-8	0.5	mg/kg	470	456	----	3.6	----
Anthracene	120-12-7	0.5	mg/kg	182	168	----	1.2	----
Fluoranthene	206-44-0	0.5	mg/kg	301	290	----	4.7	----
Pyrene	129-00-0	0.5	mg/kg	250	239	----	4.4	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	130	129	----	1.8	----
Chrysene	218-01-9	0.5	mg/kg	93.0	90.2	----	1.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	96.3	94.3	----	1.8	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	44.5	45.1	----	0.7	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	86.2	84.8	----	1.6	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	42.0	41.6	----	0.9	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	10.3	10.4	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	49.1	47.7	----	1.2	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	156	10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	3390	3020	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	7020	5950	----	<100	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH405_14.0-14.4	QC609	BH401_9.0-9.4	BH401_11-11.4	----
				Client sampling date / time: 11-FEB-2011 15:00	11-FEB-2011 15:00	10-FEB-2011 15:00	10-FEB-2011 15:00	----
				ES1103042-012	ES1103042-013	ES1103042-020	ES1103042-022	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C29 - C36 Fraction	----	100	mg/kg	**2010**	**1700**	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**12400**	**10700**	----	<50	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**5.9**	**0.6**	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	**33.0**	**2.7**	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	**4.0**	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**57.2**	**4.0**	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	**19.4**	**1.4**	----	<0.5	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**107**	**131**	----	**112**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**107**	**114**	----	**106**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**68.0**	**79.4**	----	**56.6**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**114**	**122**	----	**107**	----
Anthracene-d10	1719-06-8	0.1	%	**122**	**130**	----	**111**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**135**	**147**	----	**122**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	**109**	----	**113**	----
Toluene-D8	2037-26-5	0.1	%	**103**	**95.5**	----	**105**	----
4-Bromofluorobenzene	460-00-4	0.1	%	**105**	**95.9**	----	**115**	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC608	----	----	----	----
				Client sampling date / time: 10-FEB-2011 15:00	----	----	----	----
				ES1103042-009	**----**	**----**	**----**	**----**
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.007**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.023**	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	QC608	----	----	----	----
				Client sampling date / time	10-FEB-2011 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1103042-009	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	**25.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**78.2**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**61.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	**62.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**63.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**56.9**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**96.6**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**123**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**81.6**	----	----	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples		
EA200: Description	BH401_3.0-3.4 - 10-FEB-2011 15:00	Brown fine grained soil with some vegetation and small grey red brown and black rocks
EA200: Description	BH405_12.0-12.2 - 11-FEB-2011 15:00	Mixture of white and pale brown sandy soil with some vegetation and some small charcoal pieces and one very small fibre bundle
EA200: Description	BH401_9.0-9.4 - 10-FEB-2011 15:00	Brown fine grained soil with some vegetation and a large quantity of red brown grey and black rocks with several small fibre bundles

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

*QC664 to be sent to Labmark

COC # 4

page 1/3

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien

AECOM Project No: 60153531/6.1

Laboratory Details

Lab. Name: ALS

Lab. Address: 277 Woodpark Road, Smithfield NSW 2164

Tel: 8784 8555

Fax:

Preliminary Report by:

Final Report by:

Contact Name:

Lab Quote No: SY/418/10 V2

Project Name: Barangaroo VMP DGI

PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email :	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	Ice	other	Container (No. & type)	Metals (8)	TPH/BTEX	PAH	Asbestos	HOLD	Other
(12)	~~BH401_0.5-0.6~~			X					X								
(13)	BH401_2.0-2.4	10.2.11									250ml					X	
1	BH401_3.0-3.4										150ml*	X	X	X	X	X	
(16)	BH401_4.0-4.4										150ml					X	
2	BH401_5.0-5.4										"	X	X	X	✓		
(17)	BH401_6.0-6.4										"					X	
(18)	BH401_7.0-7.4										"					X	
(19)	BH401_8.0-8.4										"					X	
(20)	BH401_9.0-9.4										"					X	
(21)	BH401_10-10.4										250ml					X	
(22)	BH401_11-11.4										150ml					X	
(23)	BH401_12-12.4										"					X	
3	BH401_13-13.4										"					X	
4	BH401_~~13~~14-14.2										"	X	X	X			

Environmental Division Sydney

Work Order

ES1103042

Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * plus zip lock bag

Relinquished by: Lauren Kontus — Signed: — Date:

Recieved by: — Signed: 11-2-11

Printed copies of this document are uncontrolled

Page 1 of 1

Relinquished by: — Signed: — Date:

Recieved by: Sam — Signed: — Date: 11/2/11

Lab Report No. — Esky ID

Chain of Custody

COC #4

page 2/3

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Contact Name:
Lab Quote No: SY/418/10.V2
Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	Ice	other	Container (No. & type)	Analysis Request: Metals (4)	TPH/BTEX	PAHs	Asbestos	HOLD	Other
24	BH401_14-2-14.4	10-2-11		X					X		250ml					X	
25	BH401_15-15-4	"									250ml					X	
26	BH401_16-16-4	"									250ml					X	
5	BH401_17-17-4	"									250ml					X	
27	BH401_18-18-4	11-2-11									250ml	X	X	X			
6	BH401_19-2-19.4	"									150ml					X	
28	BH401_20-20-15	"									250ml	X	X	X			
29	QC663	"									150ml					X	
											150ml					X	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus
Signed: [signature] 11-2-11
Date:

Recieved by:
Signed:
Date:

Printed copies of this document are uncontrolled

Page 1 of 1

Lab Report No.
Esky ID

Relinquished by:
Signed:
Date:

Recieved by: Sam
Signed:
Date: 11/2/11 4:00pm

BMS-PM-DV-F046
Revision: Jan 08

Chain of Custody

COC 4 page 3/3

AECOM

AECOM - Sydney	
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999
	Fax: 61 2 8484 8989
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1

Laboratory Details

Lab. Name: ALS	Tel: 8784 8555
Lab. Address:277 Woodpark Road, Smithfield NSW 2164	Fax:
	Preliminary Report by:
Contact Name:	Final Report by:
	Lab Quote No: **SY/418/10 V2**
Project Name: Barangaroo VMP DGI	PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email : _____	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	METALS (8)	PAH	ASBESTOS	Other
(30)	BH405_1.1-1.4	10-2-11	-	X					X		250mL	X					
(31)	BH405_3.0-3.15	10-2-11	-	X					X		150mL	X					
7	BH405_4.0-4.3	10-2-11	-	X					X		150mL		X	X	X		
(32)	BH405_6.0-6.1	10-2-11	-	X					X		150mL	X					
8	BH405_7.0-7.3	10-2-11	-	X					X		250mL		X	X	X		
(33)	BH405_8.0-8.2	10-2-11	-	X					X		150mL	X					
(34)	BH405_9.1-9.3	10-2-11	-	X					X		150mL	X					
9	QC608	10-2-11	-		X				X		*		X	X	X		
10	BH405_12.0-12.2	11-2-11	-	X					X		ziplock bag		M	M	M	X	
11	BH405_13.0-13.2	11-2-11	-	X					X		150ml		X	X	X		
12	BH405_14.0-14.2	11-2-11	-	X					X		150ml		X	X	X		
13	QC609	11-2-11	-	X					X		150ml		X	X	X		

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * 2xHCl vials, 2x150mL ambers, 1x150mL plastic

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus Signed: [signature] Date: 11/2/11

Recieved by: Signed: Date:

Relinquished by: Signed: Date:

Recieved by: Sam Signed: Date: 11/2/11 4:30pm

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1103042**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE PIGRAM	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.pigram@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	Page	: 1 of 3
Order number	: 39540 AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 11-FEB-2011	Issue Date	: 13-FEB-2011 08:21
Client Requested Due Date	: 21-FEB-2011	Scheduled Reporting Date	: **21-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 9.1'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 33
Security Seal	: Intact.	No. of samples analysed	: 13

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.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample QC664 to be sent to Labmark.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EA200 Asbestos Identification in Soils	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1103042-001	10-FEB-2011 15:00	BH401_3.0-3.4		✓	✓
ES1103042-002	10-FEB-2011 15:00	BH401_5.0-5.4			✓
ES1103042-003	10-FEB-2011 15:00	BH401_13-13.4			✓
ES1103042-004	10-FEB-2011 15:00	BH401_14-14.2			✓
ES1103042-005	10-FEB-2011 15:00	BH401_14-17.4			✓
ES1103042-006	11-FEB-2011 15:00	BH401_19.2-19.4			✓
ES1103042-007	10-FEB-2011 15:00	BH405_4.0-4.3			✓
ES1103042-008	10-FEB-2011 15:00	BH405_7.0-7.3			✓
ES1103042-010	11-FEB-2011 15:00	BH405_12.0-12.2		✓	
ES1103042-011	11-FEB-2011 15:00	BH405_13.0-13.2			✓
ES1103042-012	11-FEB-2011 15:00	BH405_14.0-14.4			✓
ES1103042-013	11-FEB-2011 15:00	QC609			✓
ES1103042-015	10-FEB-2011 15:00	BH401_2.0-2.4	✓		
ES1103042-016	10-FEB-2011 15:00	BH401_4.0-4.4	✓		
ES1103042-017	10-FEB-2011 15:00	BH401_6.0-6.4	✓		
ES1103042-018	10-FEB-2011 15:00	BH401_7.0-7.4	✓		
ES1103042-019	10-FEB-2011 15:00	BH401_8.0-8.4	✓		
ES1103042-020	10-FEB-2011 15:00	BH401_9.0-9.4	✓		
ES1103042-021	10-FEB-2011 15:00	BH401_10-10.4	✓		
ES1103042-022	10-FEB-2011 15:00	BH401_11-11.4	✓		
ES1103042-023	10-FEB-2011 15:00	BH401_12-12.4	✓		
ES1103042-024	10-FEB-2011 15:00	BH401_14.2-14.4	✓		
ES1103042-025	10-FEB-2011 15:00	BH401_15-15.4	✓		
ES1103042-026	10-FEB-2011 15:00	BH401_16-16.4	✓		
ES1103042-027	11-FEB-2011 15:00	BH401_18-18.4	✓		
ES1103042-028	11-FEB-2011 15:00	BH401_20-20.15	✓		
ES1103042-029	11-FEB-2011 15:00	QC663	✓		
ES1103042-030	10-FEB-2011 15:00	BH405_1.1-1.4	✓		
ES1103042-031	10-FEB-2011 15:00	BH405_3.0-3.5	✓		
ES1103042-032	10-FEB-2011 15:00	BH405_6.0-6.1	✓		
ES1103042-033	10-FEB-2011 15:00	BH405_8.0-8.2	✓		
ES1103042-034	10-FEB-2011 15:00	BH405_9.1-9.3	✓		

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1103042-009	10-FEB-2011 15:00	QC608	✓

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1103042**	Page	: 1 of 15
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: LK/KO	Issue Date	: 22-FEB-2011
Order number	: 39540 AUS		
		No. of samples received	: 33
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Peter Rennie	Team Leader - Asbestos	Newcastle

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: 1668203)									
ES1103038-008	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.2	16.8	9.7	0% - 50%
ES1103038-019	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.8	17.5	2.0	0% - 50%
EA055: Moisture Content (QC Lot: 1668204)									
ES1103042-013	QC609	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.4	11.1	38.0	0% - 50%
EW1100524-009	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.7	1.5	13.8	No Limit
EA055: Moisture Content (QC Lot: 1675396)									
ES1102875-027	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.7	7.7	0.0	No Limit
ES1103302-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	60.5	60.6	0.0	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1671790)									
EB1102446-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	49	50	0.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	30	36	17.4	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	24	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	11	15.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	42	45	6.2	No Limit
ES1103042-005	BH401_14-17.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	3	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	8	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1676247)									
ES1102973-017	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	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	32	21	40.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	31	35	13.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	30	4.6	No Limit
ES1103336-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	20	25.2	0% - 50%
		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

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: 1676247) - continued									
ES1103336-002	Anonymous	EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	6	29.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1671791)									
EB1102446-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1103042-005	BH401_14-17.4	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: 1676248)									
ES1102973-017	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
ES1103336-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1667587)									
ES1103042-001	BH401_3.0-3.4	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
ES1103042-013	QC609	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	1010	868	15.3	0% - 20%
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	213	171	# 21.8	0% - 20%
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	43.2	34.3	23.0	0% - 20%
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	208	170	# 20.3	0% - 20%
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	456	371	# 20.4	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	168	140	18.4	0% - 20%
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	290	236	# 20.8	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	239	195	# 20.4	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	129	103	# 22.0	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	90.2	71.3	# 23.4	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	94.3	76.4	# 21.0	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	45.1	33.3	30.2	0% - 20%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	84.8	66.9	# 23.5	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 (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1667587) - continued									
ES1103042-013	QC609	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	41.6	32.6	24.1	0% - 20%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	10.4	8.6	18.3	0% - 50%
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	47.7	37.2	24.8	0% - 20%
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1674753)									
ES1102875-027	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	1.8	<0.5	113	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	39.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.2	1.1	68.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.3	1.1	71.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.8	0.7	85.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.5	0.6	86.3	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.7	0.7	81.8	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	<0.5	49.8	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.6	0.6	82.2	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.8	<0.5	44.4	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	1.0	<0.5	66.4	No Limit
ES1103136-042	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1667586)									
ES1103042-001	BH401_3.0-3.4	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

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: 1667586) - continued									
ES1103042-001	BH401_3.0-3.4	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1103042-013	QC609	EP071: C15 - C28 Fraction	----	100	mg/kg	5950	5210	13.2	0% - 20%
		EP071: C29 - C36 Fraction	----	100	mg/kg	1700	1510	11.9	0% - 50%
		EP071: C10 - C14 Fraction	----	50	mg/kg	3020	2840	6.0	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1668191)									
ES1103042-001	BH401_3.0-3.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1103042-013	QC609	EP080: C6 - C9 Fraction	----	10	mg/kg	10	11	10.9	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674748)									
ES1103042-022	BH401_11-11.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674752)									
ES1102875-027	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
ES1103136-042	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: 1668191)									
ES1103042-001	BH401_3.0-3.4	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
ES1103042-013	QC609	EP080: Benzene	71-43-2	0.2	mg/kg	0.6	0.7	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	2.7	3.0	10.5	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	4.0	4.5	12.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	1.4	1.6	14.9	No Limit
EP080: BTEX (QC Lot: 1674748)									
ES1103042-022	BH401_11-11.4	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

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: 1667494)									

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: 1667494) - continued									
ES1102977-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.007	0.007	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	0.014	0.014	0.0	0% - 50%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.038	0.039	2.7	No Limit
ES1103014-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0004	<0.0001	127	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.003	0.002	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.006	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	0.008	0.008	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.057	0.059	4.4	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 1667493)									
ES1102948-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1668252)									
ES1102825-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	2.6	3.8	37.6	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1669265)									
ES1102957-022	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1103092-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1669265)									
ES1102957-022	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEX (QC Lot: 1669265) - continued									
ES1102957-022	Anonymous	EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1103092-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
EG005T: Total Metals by ICP-AES (QCLot: 1671790)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	128	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	104	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	114	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	110	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	109	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	116	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	103	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1676247)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	114	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	95.1	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	103	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	102	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	98.1	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	105	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	92.6	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671791)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	110	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	80.6	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667587)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	# 114	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	# 115	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	# 113	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	# 113	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	111	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	112	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	105	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	106	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	113	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	110	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	106	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	89.4	71	113

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: 1667587) - continued								
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	88.5	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	83.7	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	109	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	# 112	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	111	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	# 114	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	# 117	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	107	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	113	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	95.2	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	105	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	105	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	102	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667586)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	89.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	97.8	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	88.6	72.6	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668191)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.5	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674748)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	90.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	110	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	98.1	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.8	72.6	117
EP080: BTEX (QCLot: 1668191)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.0	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	94.3	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.6	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.1	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.0	63	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEX (QCLot: 1674748)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.1	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.0	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.3	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	97.9	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.6	63	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1667494)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.1	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.1	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.1	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1667493)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.1	86	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1668252)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	66.4	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	80.9	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	69.3	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	76.2	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	73.2	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	74.7	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	84.0	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	80.6	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	81.5	64.1	117
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1668252) - continued								
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	72.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	67.2	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	87.6	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	75.7	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	67.7	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	67.4	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	67.9	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668255)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	68.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	78.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	80.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669265)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	118	75	127
EP080: BTEX (QCLot: 1669265)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	108	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	110	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	85.6	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	87.0	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	84.8	73	121

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: 1671790)							
EB1102446-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	97.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	97.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	109	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.9	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	97.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1676247)							
ES1102973-017	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	101	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.3	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.9	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671791)							
EB1102446-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	111	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)							
ES1102973-017	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1667587)							
ES1103042-001	BH401_3.0-3.4	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	110	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	111	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)							
ES1102875-027	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	122	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1667586)							
ES1103042-001	BH401_3.0-3.4	EP071: C10 - C14 Fraction	----	640 mg/kg	93.2	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	87.9	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	83.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668191)							
ES1103042-001	BH401_3.0-3.4	EP080: C6 - C9 Fraction	----	26 mg/kg	78.1	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674748)							
ES1103042-022	BH401_11-11.4	EP080: C6 - C9 Fraction	----	26 mg/kg	85.7	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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)							
ES1102875-027	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	100	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	87.6	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.3	70	130
EP080: BTEX (QCLot: 1668191)							
ES1103042-001	BH401_3.0-3.4	EP080: Benzene	71-43-2	2.5 mg/kg	77.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	78.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	83.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	83.5	70	130
EP080: BTEX (QCLot: 1674748)							
ES1103042-022	BH401_11-11.4	EP080: Benzene	71-43-2	2.5 mg/kg	91.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	93.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	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: 1667494)							
ES1102977-003	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	102	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	92.9	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	94.3	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	86.2	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	91.3	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	93.8	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	100	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1667493)							
ES1102948-003	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	90.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1668252)							
ES1102825-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	2 µg/L	77.0	70	130
		EP075(SIM): Pyrene	129-00-0	2 µg/L	75.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669265)							
ES1102957-022	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	122	70	130
EP080: BTEX (QCLot: 1669265)							
ES1102957-022	Anonymous						

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
EP080: BTEX (QCLot: 1669265) - continued							
ES1102957-022	Anonymous	EP080: Benzene	71-43-2	25 µg/L	90.6	70	130
		EP080: Toluene	108-88-3	25 µg/L	108	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	82.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	84.6	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	76.7	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1103042**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 11-FEB-2011
Sampler	: LK/KO	Issue Date	: 22-FEB-2011
Order number	: 39540 AUS		
		No. of samples received	: 33
Quote number	: SY/418/10 V2	No. of samples analysed	: 15

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 BH401_3.0-3.4, BH401_5.0-5.4, BH401_13-13.4, BH401_14-14.2, BH401_14-17.4, BH405_4.0-4.3, BH405_7.0-7.3	**10-FEB-2011**	**----**	----	----	**14-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved BH401_11-11.4	**10-FEB-2011**	**----**	----	----	**18-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved BH401_19.2-19.4, BH405_13.0-13.2, BH405_14.0-14.4, QC609	**11-FEB-2011**	**----**	----	----	**14-FEB-2011**	25-FEB-2011	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples							
Snap Lock Bag BH401_3.0-3.4	**10-FEB-2011**	**---**	09-AUG-2011	----	**22-FEB-2011**	21-AUG-2011	✓
Snap Lock Bag BH405_12.0-12.2	**11-FEB-2011**	**---**	10-AUG-2011	----	**22-FEB-2011**	21-AUG-2011	✓
Soil Glass Jar - Unpreserved BH401_9.0-9.4	**10-FEB-2011**	**---**	09-AUG-2011	----	**22-FEB-2011**	21-AUG-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved BH401_3.0-3.4, BH401_5.0-5.4, BH401_13-13.4, BH401_14-14.2, BH401_14-17.4, BH405_4.0-4.3, BH405_7.0-7.3	**10-FEB-2011**	**16-FEB-2011**	09-AUG-2011	✓	**17-FEB-2011**	09-AUG-2011	✓
Soil Glass Jar - Unpreserved BH401_11-11.4	**10-FEB-2011**	**20-FEB-2011**	09-AUG-2011	✓	**21-FEB-2011**	09-AUG-2011	✓
Soil Glass Jar - Unpreserved BH401_19.2-19.4, BH405_13.0-13.2, BH405_14.0-14.4, QC609	**11-FEB-2011**	**16-FEB-2011**	10-AUG-2011	✓	**17-FEB-2011**	10-AUG-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
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH401_3.0-3.4,	BH401_5.0-5.4,	**10-FEB-2011**	**16-FEB-2011**	10-MAR-2011	✓	**17-FEB-2011**	10-MAR-2011	✓
BH401_13-13.4,	BH401_14-14.2,							
BH401_14-17.4,	BH405_4.0-4.3,							
BH405_7.0-7.3								
Soil Glass Jar - Unpreserved								
BH401_11-11.4		**10-FEB-2011**	**20-FEB-2011**	10-MAR-2011	✓	**21-FEB-2011**	10-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_19.2-19.4,	BH405_13.0-13.2,	**11-FEB-2011**	**16-FEB-2011**	11-MAR-2011	✓	**17-FEB-2011**	11-MAR-2011	✓
BH405_14.0-14.4,	QC609							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH401_3.0-3.4,	BH401_5.0-5.4,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH401_13-13.4,	BH401_14-14.2,							
BH401_14-17.4,	BH405_4.0-4.3,							
BH405_7.0-7.3								
Soil Glass Jar - Unpreserved								
BH401_11-11.4		**10-FEB-2011**	**18-FEB-2011**	24-FEB-2011	✓	**18-FEB-2011**	30-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_19.2-19.4,	BH405_13.0-13.2,	**11-FEB-2011**	**14-FEB-2011**	25-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH405_14.0-14.4,	QC609							
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH401_3.0-3.4,	BH401_5.0-5.4,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**14-FEB-2011**	24-FEB-2011	✓
BH401_13-13.4,	BH401_14-14.2,							
BH401_14-17.4,	BH405_4.0-4.3,							
BH405_7.0-7.3								
Soil Glass Jar - Unpreserved								
BH401_3.0-3.4,	BH401_5.0-5.4,	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH401_13-13.4,	BH401_14-14.2,							
BH401_14-17.4,	BH405_4.0-4.3,							
BH405_7.0-7.3								
Soil Glass Jar - Unpreserved								
BH401_11-11.4		**10-FEB-2011**	**18-FEB-2011**	24-FEB-2011	✓	**18-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved								
BH401_19.2-19.4,	BH405_13.0-13.2,	**11-FEB-2011**	**14-FEB-2011**	25-FEB-2011	✓	**14-FEB-2011**	25-FEB-2011	✓
BH405_14.0-14.4,	QC609							
Soil Glass Jar - Unpreserved								
BH401_19.2-19.4,	BH405_13.0-13.2,	**11-FEB-2011**	**14-FEB-2011**	25-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
BH405_14.0-14.4,	QC609							

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 BH401_3.0-3.4, BH401_5.0-5.4, BH401_13-13.4, BH401_14-14.2, BH401_14-17.4, BH405_4.0-4.3, BH405_7.0-7.3	**10-FEB-2011**	**14-FEB-2011**	24-FEB-2011	✓	**14-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved BH401_11-11.4	**10-FEB-2011**	**18-FEB-2011**	24-FEB-2011	✓	**18-FEB-2011**	24-FEB-2011	✓
Soil Glass Jar - Unpreserved BH401_19.2-19.4, BH405_13.0-13.2, BH405_14.0-14.4, QC609	**11-FEB-2011**	**14-FEB-2011**	25-FEB-2011	✓	**14-FEB-2011**	25-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 - Nitric Acid; Filtered QC608	**10-FEB-2011**	**---**	09-AUG-2011	----	**14-FEB-2011**	09-AUG-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered QC608	**10-FEB-2011**	**---**	10-MAR-2011	----	**14-FEB-2011**	10-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC608	**10-FEB-2011**	**14-FEB-2011**	17-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved QC608	**10-FEB-2011**	**14-FEB-2011**	17-FEB-2011	✓	**15-FEB-2011**	26-MAR-2011	✓
Amber VOC Vial - HCl QC608	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-FEB-2011**	24-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl QC608	**10-FEB-2011**	**15-FEB-2011**	24-FEB-2011	✓	**15-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	6	52	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	29	**13.8**	**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	29	**13.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	22	**13.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**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	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**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	29	**6.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	22	**9.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	40	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	29	**6.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	22	**9.1**	**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	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	**20.0**	**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	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	5	**20.0**	**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).
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
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)
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
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 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	ES1103042-013	QC609	**Acenaphthylene**	208-96-8	21.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Fluorene**	86-73-7	20.3 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Phenanthrene**	85-01-8	20.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Fluoranthene**	206-44-0	20.8 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Pyrene**	129-00-0	20.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Benz(a)anthracene**	56-55-3	22.0 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Chrysene**	218-01-9	23.4 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Benzo(b)fluoranthene**	205-99-2	21.0 %	0-20%	**RPD exceeds LOR based limits**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	ES1103042-013	QC609	**Benzo(a)pyrene**	50-32-8	23.5 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1958782-007	----	**Naphthalene**	91-20-3	114 %	81.9-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1958782-007	----	**Acenaphthylene**	208-96-8	115 %	79.6-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1958782-007	----	**Acenaphthene**	83-32-9	113 %	81.5-112%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Fluorene**	86-73-7	112 %	79.9-112%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1958782-007	----	**Fluorene**	86-73-7	113 %	79.9-112%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Fluoranthene**	206-44-0	114 %	78.8-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Pyrene**	129-00-0	117 %	78.9-113%	**Recovery greater than upper control limit**

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

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1103100**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 14-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Site	: ----		
		No. of samples received	: 28
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Phalak Inthaksone	Organics Co-ordinator	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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **'Am' Amosite (brown asbestos)**
- **'Ch' Chrysotile (white asbestos)**
- **'Cr' Crocidolite (blue asbestos)**
- **Legend for Asbestos Type:**
- **'t' Trace levels**
- **'UMF' Unknown mineral fibres**
- **Asbestos Identification: Samples were analysed by Polarised Light Microscopy including dispersion staining.**
- **Confirmation by alternative techniques is recommended for samples where unknown mineral fibres are detected. Negative results for vinyl tiles should be confirmed by an independent analytical technique.**
- **EP080: Level of Reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH407_8.0-8.1	BH407_12.0-12.18	BH407_14.0-14.5	BH407_16.3-16.5	BH407_17.4-17.6
				Client sampling date / time: [14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]
				ES1103100-003	ES1103100-005	ES1103100-007	ES1103100-009	ES1103100-010
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	15.4	12.3	16.7	16.3	15.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	9	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	10	6	10	2
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	11	6	6	5	<5
Nickel	7440-02-0	2	mg/kg	4	7	2	<2	<2
Zinc	7440-66-6	5	mg/kg	24	15	<5	<5	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.2	0.4	0.4
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH407_8.0-8.1	BH407_12.0-12.18	BH407_14.0-14.5	BH407_16.3-16.5	BH407_17.4-17.6
				Client sampling date / time: [14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]
				ES1103100-003	ES1103100-005	ES1103100-007	ES1103100-009	ES1103100-010
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**114**	**119**	**122**	**104**	**119**
2-Chlorophenol-D4	93951-73-6	0.1	%	**87.7**	**93.6**	**92.9**	**94.0**	**90.2**
2.4.6-Tribromophenol	118-79-6	0.1	%	**52.1**	**56.5**	**56.9**	**60.2**	**51.9**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**92.2**	**101**	**97.6**	**99.3**	**96.4**
Anthracene-d10	1719-06-8	0.1	%	**90.5**	**98.0**	**93.7**	**97.2**	**93.5**
4-Terphenyl-d14	1718-51-0	0.1	%	**95.4**	**104**	**99.4**	**104**	**98.8**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**121**	**119**	**121**	**120**	**118**
Toluene-D8	2037-26-5	0.1	%	**120**	**108**	**120**	**120**	**117**
4-Bromofluorobenzene	460-00-4	0.1	%	**116**	**105**	**110**	**109**	**110**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH407_18.0-18.3	QC610	BH400_6.0-6.4	BH400_9.0-9.4	BH400_12.0-12.4
Client sampling date / time				[14-FEB-2011]	[14-FEB-2011]	11-FEB-2011 15:00	[14-FEB-2011]	[14-FEB-2011]
				ES1103100-011	ES1103100-012	ES1103100-017	ES1103100-020	ES1103100-023
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	15.8	17.9	16.5	15.8	19.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	2	<1	<1
Chromium	7440-47-3	2	mg/kg	11	7	7	6	4
Copper	7440-50-8	5	mg/kg	<5	<5	14	164	13
Lead	7439-92-1	5	mg/kg	6	8	234	86	226
Nickel	7440-02-0	2	mg/kg	<2	2	3	10	5
Zinc	7440-66-6	5	mg/kg	<5	<5	163	122	98
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	3.2	0.1	0.3
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	6.1	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	0.6	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.7	1.4	3.4
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	0.8	1.2
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.8	10.3	5.4
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.8	9.4	5.3
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	3.2	2.3
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	2.5	1.9
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	3.2	2.4
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	1.2	0.8
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	2.5	1.9
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	1.0	0.8
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	1.3	1.0
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	370	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	200	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	570	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	1.2	0.3	0.3	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	1.1	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH407_18.0-18.3	QC610	BH400_6.0-6.4	BH400_9.0-9.4	BH400_12.0-12.4
				Client sampling date / time: [14-FEB-2011]	[14-FEB-2011]	11-FEB-2011 15:00	[14-FEB-2011]	[14-FEB-2011]
				ES1103100-011	ES1103100-012	ES1103100-017	ES1103100-020	ES1103100-023
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**125**	**113**	**123**	**108**	**122**
2-Chlorophenol-D4	93951-73-6	0.1	%	**92.7**	**84.5**	**99.5**	**86.7**	**91.6**
2.4.6-Tribromophenol	118-79-6	0.1	%	**58.0**	**50.0**	**57.4**	**59.4**	**58.7**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**100**	**90.7**	**104**	**90.7**	**97.4**
Anthracene-d10	1719-06-8	0.1	%	**96.4**	**88.8**	**102**	**89.1**	**95.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**102**	**93.9**	**108**	**81.8**	**93.9**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**118**	**114**	**117**	**119**	**117**
Toluene-D8	2037-26-5	0.1	%	**120**	**92.9**	**124**	**111**	**121**
4-Bromofluorobenzene	460-00-4	0.1	%	**115**	**99.4**	**113**	**116**	**110**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH400_13.2-13.4	BH400_14.0-14.2	BH400_16.0-16.4	----	----
				Client sampling date / time	[14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	----	----
					ES1103100-024	ES1103100-025	ES1103100-027	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		**29.7**	**16.4**	**17.0**	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**8**	<5	**10**	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg		**13**	**9**	**20**	----	----
Copper	7440-50-8	5	mg/kg		<5	<5	<5	----	----
Lead	7439-92-1	5	mg/kg		**10**	<5	**6**	----	----
Nickel	7440-02-0	2	mg/kg		<2	<2	<2	----	----
Zinc	7440-66-6	5	mg/kg		**9**	<5	<5	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		**0.2**	<0.1	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	**6.0**	**734**	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	**1.3**	**215**	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	**26.2**	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	**1.3**	**156**	----	----
Phenanthrene	85-01-8	0.5	mg/kg		**0.5**	**3.8**	**363**	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	**1.2**	**78.4**	----	----
Fluoranthene	206-44-0	0.5	mg/kg		**0.9**	**2.0**	**111**	----	----
Pyrene	129-00-0	0.5	mg/kg		**0.9**	**1.8**	**150**	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	**0.8**	**46.1**	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	**0.6**	**35.3**	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	**0.6**	**26.7**	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	**8.0**	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	**26.0**	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	**6.8**	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	**2.2**	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	**7.6**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	**331**	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	**3000**	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	**5600**	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	**810**	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	**9410**	----	----
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	**40.3**	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	**99.4**	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH400_13.2-13.4	BH400_14.0-14.2	BH400_16.0-16.4	----	----
				Client sampling date / time: [14-FEB-2011]	[14-FEB-2011]	[14-FEB-2011]	----	----
				ES1103100-024	ES1103100-025	ES1103100-027	----	----
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	**11.2**	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	**78.2**	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	**37.9**	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**118**	**120**	**113**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**88.4**	**95.6**	**96.0**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**53.9**	**60.7**	**58.7**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**96.4**	**109**	**89.7**	----	----
Anthracene-d10	1719-06-8	0.1	%	**85.4**	**96.7**	**92.5**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**89.3**	**99.3**	**92.3**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**119**	**107**	**110**	----	----
Toluene-D8	2037-26-5	0.1	%	**116**	**103**	**95.3**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**104**	**96.3**	**92.1**	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC665	----	----	----	----
				Client sampling date / time: 11-FEB-2011 15:00	----	----	----	----
				ES1103100-028	**----**	**----**	**----**	**----**
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**				Client sample ID	QC665	----	----	----	----
				Client sampling date / time	11-FEB-2011 15:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1103100-028**	**----**	**----**	**----**	**----**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**29.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**68.3**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**64.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**70.2**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**74.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**65.9**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**102**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		**93.0**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**95.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Chain of Custody

COC #5 page 1/3

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

Subcon / Forward Lab / Split WO — Yes (tick)
Lab / Analysis: Labmark / Newcastle
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By COC / Internal Sheet:

1. Urgent TAT required? (please circle: 24hr 48hr _____days)
2. Fast TAT Guarantee Required?
3. Is any sediment layer present in waters to be excluded from extractions?
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?
5. Special storage requirements? (details: _____)
6. Shell Quality Partnership:
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : _____

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	HOLD	TRH / BTEX	PAHs	ASBESTOS	METALS (5)	Other
1	BH407_1.0-1.3	11.2.11	–	X					X		150mL				X		
2	BH407_5.0-5.1	11.2.11	–	X					X		↓	X					
3	BH407_8.0-8.1	14.2.11	–	X					X				X	X		X	
4	BH407_9.0-9.1	14.2.11	–	X					X			X					
5	BH407_12.0-12.18	14.2.11	–	X					X				X	X		X	
6	BH407_13.0-13.2	14.2.11	–	X					X		150mL	X					
7	BH407_14.0-14.5	14.2.11	–	X					X		150mL		X	X		X	
8	BH407_15.1-15.45	14.2.11	–	X					X		250mL	X					
9	BH407_16.3-16.5	14.2.11	–	X					X		250mL		X	X		X	
10	BH407_17.4-17.6	14.2.11	–	X					X		250mL		X	X		X	
11	BH407_18.0-18.3	14.2.11	–	X					X		250mL		X	X		X	
12	QC610	14.2.11	–	X					X		150mL		X	X		X	

Environmental Division Sydney
Work Order
ES1103100
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No. | Esky ID

Relinquished by: Lauren Kontus — Signed: — Date: 14-2-11 3pm
Recieved by: — Signed: — Date:

Relinquished by: — Signed: — Date:
Recieved by: Wanida — Signed: — Date: 14/2/11 16:30

COC #5 page 2/3

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/418/10 V2

Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr ____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: ____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	PAHs	ASBESTOS	METALS (8)	Other
13	BH400_2.0-2.4	11.2.11		X					X		250ml	X					
14	BH400_3.0-3.4										150ml	X					
15	BH400_4.0-4.4										150ml				X		
16	BH400_5.0-5.4										150ml	X					
17	BH400_6.0-6.4										250ml		X	X		X	
18	BH400_7.0-7.4	↓									250ml	X					
19	BH400_8.0-8.4	14.2.11									150ml	X					
20	BH400_9.0-9.4										"		X	X		X	
21	BH400_10-10.4										"	X					
22	BH400_11-11.4										"	X					
23	BH400_12-12.4										250ml		X	X		X	
24	BH400_13.2-13.4										"		X	X		X	
25	BH400_14-14.2										"		X	X		X	
26	BH400_15-15.4	↓		↓					↓		"		X	X		X	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus Kate O'Brien Signed:
Recieved by: Signed:
Date: 14/2/11

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Page 1 of 1

Relinquished by: Signed:
Recieved by: Wanida Signed: Georgia
Date:

Lab Report No.
Esky ID

BMS-PM-DV-F046 Revision: dart 00 (6.30)

COC #5 page 3/3

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
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Contact Name:
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Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/418/10 V2

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: frit'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	PAHs	Metals (8)	Other
27	BH402_16-16.4	14.2.11		X					X		250ml		X	X	X	* PID > 500 ppm
28	QC665	11.2.11			X						*		X	X	X	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * 2x vials, 1x metals, 1x Amber

Relinquished by: Lauren Kontus / Kate O'Brien Signed: 14/2/11
Recieved by: Signed: Date:

Relinquished by: Signed: Date:
Recieved by: Signed: 14/02/11

Lab Report No. Esky ID

COC #5 page 1/1

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

LABMARK

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Contact Name:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No & type)	HOLD	PAH	TPH/BTEX	METALS (6)	Other
	QC611	14/2/11		X					X		150ml		X	X	X	
	Please send QC611 to Labmark															

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date: Labmark
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus/Kate O'Brien Signed: Date: 14/2/11
Recieved by: Signed: Date:

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Page 1 of 1
BMS-PM-DV-F046

Relinquished by: Signed: Date:
Recieved by: Wonda Signed: 140311 16:30

Lab Report No | Esky ID

Revision: Jun 08

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1103100**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE PIGRAM	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.pigram@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 14-FEB-2011	Issue Date	: 15-FEB-2011 08:44
Client Requested Due Date	: 21-FEB-2011	Scheduled Reporting Date	: **21-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.2'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 28
Security Seal	: Intact.	No. of samples analysed	: 14

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.
- Asbestos analysis will be subcontracted to ASET.
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample id QC611 sent to Labmark**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - ASB-SOL (Subcontracted) Asbestos - Count (Solid)	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1103100-001	11-FEB-2011 15:00	BH407_1.0-1.3		✓	
ES1103100-002	11-FEB-2011 15:00	BH407_5.0-5.1	✓		
ES1103100-003	[14-FEB-2011]	BH407_8.0-8.1			✓
ES1103100-004	[14-FEB-2011]	BH407_9.0-9.1	✓		
ES1103100-005	[14-FEB-2011]	BH407_12.0-12.18			✓
ES1103100-006	[14-FEB-2011]	BH407_13.0-13.2	✓		
ES1103100-007	[14-FEB-2011]	BH407_14.0-14.5			✓
ES1103100-008	[14-FEB-2011]	BH407_15.0-15.45	✓		
ES1103100-009	[14-FEB-2011]	BH407_16.3-16.5			✓
ES1103100-010	[14-FEB-2011]	BH407_17.4-17.6			✓
ES1103100-011	[14-FEB-2011]	BH407_18.0-18.3			✓
ES1103100-012	[14-FEB-2011]	QC610			✓
ES1103100-013	11-FEB-2011 15:00	BH400_2.0-2.4	✓		
ES1103100-014	11-FEB-2011 15:00	BH400_3.0-3.4	✓		
ES1103100-015	11-FEB-2011 15:00	BH400_4.0-4.4		✓	
ES1103100-016	11-FEB-2011 15:00	BH400_5.0-5.4	✓		
ES1103100-017	11-FEB-2011 15:00	BH400_6.0-6.4			✓
ES1103100-018	11-FEB-2011 15:00	BH400_7.0-7.4	✓		
ES1103100-019	[14-FEB-2011]	BH400_8.0-8.4	✓		
ES1103100-020	[14-FEB-2011]	BH400_9.0-9.4			✓
ES1103100-021	[14-FEB-2011]	BH400_10.0-10.4	✓		
ES1103100-022	[14-FEB-2011]	BH400_11.0-11.4	✓		
ES1103100-023	[14-FEB-2011]	BH400_12.0-12.4			✓
ES1103100-024	[14-FEB-2011]	BH400_13.2-13.4			✓
ES1103100-025	[14-FEB-2011]	BH400_14.0-14.2			✓
ES1103100-026	[14-FEB-2011]	BH400_15.0-15.4	✓		
ES1103100-027	[14-FEB-2011]	BH400_16.0-16.4			✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1103100-028	11-FEB-2011 15:00	QC665	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Attachment - Report (SUBCO)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental	Email	kate.obrien@aecom.com
- A4 - AU Tax Invoice	Email	kate.obrien@aecom.com
- Attachment - Report (SUBCO)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG	Email	kate.obrien@aecom.com
- EDI Format - ESDAT	Email	kate.obrien@aecom.com
- EDI Format - HLAPro	Email	kate.obrien@aecom.com
- EDI Format - XTab	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Attachment - Report (SUBCO)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1103100**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Order number	: 39540AUS		
		No. of samples received	: 28
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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*
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	Organics
Phalak Inthaksone	Organics Co-ordinator	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: 1669368)									
ES1103035-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.5	17.3	4.9	0% - 50%
ES1103067-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.4	7.9	5.9	No Limit
EA055: Moisture Content (QC Lot: 1669369)									
ES1103100-009	BH407_16.3-16.5	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.3	17.1	5.3	0% - 50%
ES1103100-027	BH400_16.0-16.4	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.0	16.8	1.3	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1671792)									
ES1103100-003	BH407_8.0-8.1	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	13	10.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	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	11	11	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	24	0.0	No Limit
ES1103100-024	BH400_13.2-13.4	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	15	14.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	16	41.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	9	16	55.2	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1671793)									
ES1103100-003	BH407_8.0-8.1	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1103100-024	BH400_13.2-13.4	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1668965)									
ES1103100-003	BH407_8.0-8.1	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

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: 1668965) - continued									
ES1103100-003	BH407_8.0-8.1	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
ES1103100-017	BH400_6.0-6.4	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	6.1	8.7	35.4	0% - 50%
		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	1.1	75.7	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	0.6	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	0.7	1.7	80.9	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	1.8	79.7	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.8	1.6	67.8	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	0.7	35.7	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	0.8	43.6	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: 1668958)									
ES1103100-003	BH407_8.0-8.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1103100-017	BH400_6.0-6.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1668964)									
ES1103100-003	BH407_8.0-8.1	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
ES1103100-017	BH400_6.0-6.4	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	180	54.9	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	140	32.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEX (QC Lot: 1668958)									
ES1103100-003	BH407_8.0-8.1	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
ES1103100-017	BH400_6.0-6.4	EP080: Benzene	71-43-2	0.2	mg/kg	0.3	0.3	0.0	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEX (QC Lot: 1668958) - continued									
ES1103100-017	BH400_6.0-6.4	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: 1670843)									
ES1102970-015	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1103160-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1670842)									
EB1102285-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1103160-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1669782)									
ES1103094-001	Anonymous	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1669782) - continued									
ES1103094-001	Anonymous	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1669781)									
ES1103094-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	360	430	17.4	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	70	70	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1670254)									
ES1103081-008	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1103100-028	QC665	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1670254)									
ES1103081-008	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
ES1103100-028	QC665	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
EG005T: Total Metals by ICP-AES (QCLot: 1671792)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	111	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	89.5	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	99.7	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	96.6	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	95.7	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	101	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	90.5	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671793)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	108	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1668965)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	# 113	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	112	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	111	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	110	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	106	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	105	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	98.1	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	100	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	101	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	105	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	104	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.8	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	108	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	98.5	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	95.8	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	97.4	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668958)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	96.1	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668964)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	99.4	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	87.4	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	104	72.6	117
EP080: BTEX (QCLot: 1668958)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	82.4	63	121

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080: BTEX (QCLot: 1668958) - continued								
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	89.1	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	83.7	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	89.4	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	86.8	63	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1670843)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.6	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.4	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1670842)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	111	86	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669782)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	72.5	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	81.3	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	74.7	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	65.0	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	83.6	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	81.6	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	94.0	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	97.1	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	90.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	75.3	62.5	116
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669782) - continued								
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	79.3	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	88.6	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	85.7	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	83.0	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	83.0	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	87.2	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669781)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	68.4	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	90.3	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	95.9	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1670254)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	113	75	127
EP080: BTEX (QCLot: 1670254)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	110	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	104	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	105	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	103	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	106	73	121

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: 1671792)							
ES1103100-003	BH407_8.0-8.1	EG005T: Arsenic	7440-38-2	50 mg/kg	99.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.1	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.6	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	97.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.0	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.2	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1671793)							
ES1103100-003	BH407_8.0-8.1	EG035T: Mercury	7439-97-6	5 mg/kg	118	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1668965)							
ES1103100-003	BH407_8.0-8.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	101	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668958)							
ES1103100-003	BH407_8.0-8.1	EP080: C6 - C9 Fraction	----	26 mg/kg	86.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1668964)							
ES1103100-003	BH407_8.0-8.1	EP071: C10 - C14 Fraction	----	640 mg/kg	99.5	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	80.8	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	72.8	70	130
EP080: BTEX (QCLot: 1668958)							
ES1103100-003	BH407_8.0-8.1	EP080: Benzene	71-43-2	2.5 mg/kg	88.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	83.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	88.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	89.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	89.2	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: 1670843)							
ES1102970-016	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	95.7	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	96.5	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	95.2	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	90.3	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: 1670843) - continued							
ES1102970-016	Anonymous	EG020A-F: Lead	7439-92-1	0.2 mg/L	91.4	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	96.6	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	102	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1670842)							
ES1102965-025	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	110	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1669782)							
ES1103094-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	2 µg/L	83.1	70	130
		EP075(SIM): Pyrene	129-00-0	2 µg/L	91.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1669781)							
ES1103094-002	Anonymous	EP071: C10 - C14 Fraction	----	20 µg/L	120	70	130
		EP071: C15 - C28 Fraction	----	20 µg/L	# Not Determined	70	130
		EP071: C29 - C36 Fraction	----	20 µg/L	128	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1670254)							
ES1103081-008	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	116	70	130
EP080: BTEX (QCLot: 1670254)							
ES1103081-008	Anonymous	EP080: Benzene	71-43-2	25 µg/L	105	70	130
		EP080: Toluene	108-88-3	25 µg/L	94.2	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	111	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	112	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	111	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1103100**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Order number	: 39540AUS		
		No. of samples received	: 28
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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							
BH400_6.0-6.4	**11-FEB-2011**	**----**	----	----	**15-FEB-2011**	25-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**----**	----	----	**15-FEB-2011**	28-FEB-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved							
BH400_6.0-6.4	**11-FEB-2011**	**16-FEB-2011**	10-AUG-2011	✓	**17-FEB-2011**	10-AUG-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**16-FEB-2011**	13-AUG-2011	✓	**17-FEB-2011**	13-AUG-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved							
BH400_6.0-6.4	**11-FEB-2011**	**16-FEB-2011**	11-MAR-2011	✓	**17-FEB-2011**	11-MAR-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**16-FEB-2011**	14-MAR-2011	✓	**17-FEB-2011**	14-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							
BH400_6.0-6.4	**11-FEB-2011**	**15-FEB-2011**	25-FEB-2011	✓	**16-FEB-2011**	27-MAR-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**15-FEB-2011**	28-FEB-2011	✓	**16-FEB-2011**	27-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH400_6.0-6.4	**11-FEB-2011**	**15-FEB-2011**	25-FEB-2011	✓	**15-FEB-2011**	25-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**15-FEB-2011**	28-FEB-2011	✓	**15-FEB-2011**	28-FEB-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
BH400_6.0-6.4	**11-FEB-2011**	**15-FEB-2011**	25-FEB-2011	✓	**15-FEB-2011**	25-FEB-2011	✓
Soil Glass Jar - Unpreserved							
BH407_8.0-8.1, BH407_12.0-12.18, BH407_14.0-14.5, BH407_16.3-16.5, BH407_17.4-17.6, BH407_18.0-18.3, QC610, BH400_9.0-9.4, BH400_12.0-12.4, BH400_13.2-13.4, BH400_14.0-14.2, BH400_16.0-16.4	**14-FEB-2011**	**15-FEB-2011**	28-FEB-2011	✓	**15-FEB-2011**	28-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 - Nitric Acid; Filtered							
QC665	**11-FEB-2011**	**---**	10-AUG-2011	----	**16-FEB-2011**	10-AUG-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered							
QC665	**11-FEB-2011**	**---**	11-MAR-2011	----	**16-FEB-2011**	11-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
QC665	**11-FEB-2011**	**15-FEB-2011**	18-FEB-2011	✓	**17-FEB-2011**	27-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							
QC665	**11-FEB-2011**	**15-FEB-2011**	18-FEB-2011	✓	**16-FEB-2011**	27-MAR-2011	✓
Amber VOC Vial - HCl							
QC665	**11-FEB-2011**	**16-FEB-2011**	25-FEB-2011	✓	**16-FEB-2011**	25-FEB-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl							
QC665	**11-FEB-2011**	**16-FEB-2011**	25-FEB-2011	✓	**16-FEB-2011**	25-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	4	36	**11.1**	**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
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	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	16	**12.5**	**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	16	**6.3**	**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	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**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	16	**6.3**	**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	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**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	16	**6.3**	**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	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	16	**6.3**	**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	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**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
Asbestos - Count (Solid)	ASB-SOL	SOIL	Asbestos Count on solid matrices using PLM conducted by Subcontracting Laboratory
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)
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
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 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	1960563-007	----	**Naphthalene**	91-20-3	113 %	81.9-113%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP080/071: Total Petroleum Hydrocarbons	ES1103094-002	Anonymous	**C15 - C28 Fraction**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **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.**

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET25312/ 28492 / 1 - 2
Your ref :ES1103100
NATA Accreditation No: 14484

16 February 2011

Australian Laboratory Services Pty Ltd
277, Woodpark Road
Smithfield
NSW 2164

Attn: Mr Victor Kedicioglu

Dear Victor,

Asbestos Identification
This report presents the results of two samples, forwarded by Australian Laboratory Services Pty Ltd on 15 February 2011, for analysis for asbestos.

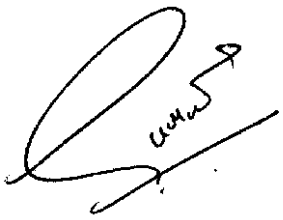
1.Introduction: Two samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining Method **(Safer Environment Method 1.)**

3. Results : **Sample No. 1. ASET25312 / 28492 / 1. ES1103100 - 001 - BH407 - 1.0 - 1.3.**
Approx dimensions 8.0 cm x 6.5 cm x 3.75 cm
The sample consisted of a mixture of sandy soil, stones and plant matter, fragments of cement like material and sandstones..
No asbestos detected.

Sample No. 2. ASET25312 / 28492 / 2. ES1103100 - 015 - BH400 - 4.0 - 4.4.
Approx dimensions 8.0 cm x 7.0 cm x 3.0 cm
The sample consisted of a mixture of sandy soil, stones and plant matter, fragments of plaster, bitumin and cement like material.
No asbestos detected.

Analysed and reported by,



Mahen De Silva . BSc. MSc. Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory.
Approved Identifier.

This document is issued in accordance with NATA's Accreditation requirements. Accredited for compliance with ISO/IEC 17025.

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1103336**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540 AUS		
C-O-C number	: ----	Date Samples Received	: 15-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Site	: ----		
		No. of samples received	: 14
Quote number	: SY/418/10 V2	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 Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control 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*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP080:Level of Reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH409_3.7-4.0	BH409_5.0-5.3	BH409_7.0-7.3	BH408_2.0-2.4	BH408_8.0-8.3
				Client sampling date / time: 14-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00
				ES1103336-002	ES1103336-004	ES1103336-006	ES1103336-009	ES1103336-012
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	17.0	31.2	16.7	12.8	15.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	22	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	7	14	8	22
Copper	7440-50-8	5	mg/kg	<5	<5	<5	36	<5
Lead	7439-92-1	5	mg/kg	6	<5	6	10	5
Nickel	7440-02-0	2	mg/kg	<2	3	<2	8	3
Zinc	7440-66-6	5	mg/kg	8	7	<5	30	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	33.8	2.8	<0.5	13.0
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	2.8	0.7	2.2	6.1
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	5.6	<0.5	<0.5	1.8
Fluorene	86-73-7	0.5	mg/kg	<0.5	2.2	<0.5	<0.5	7.0
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6.8	1.1	6.6	9.4
Anthracene	120-12-7	0.5	mg/kg	<0.5	1.9	<0.5	3.5	6.2
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.2	<0.5	12.6	4.3
Pyrene	129-00-0	0.5	mg/kg	<0.5	1.8	0.6	12.9	6.9
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	0.6	<0.5	6.2	2.6
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	5.2	1.9
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	7.1	1.1
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	3.1	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	6.3	1.3
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	3.6	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	4.5	0.6
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	12	106	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	150	<50	<50	100
C15 - C28 Fraction	----	100	mg/kg	<100	180	<100	190	350
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	260	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	330	<50	450	450
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	1.8	2.8	<0.2	0.6
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	22.3	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH409_3.7-4.0	BH409_5.0-5.3	BH409_7.0-7.3	BH408_2.0-2.4	BH408_8.0-8.3
				Client sampling date / time: 14-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00
				ES1103336-002	ES1103336-004	ES1103336-006	ES1103336-009	ES1103336-012
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	**3.5**	**3.5**	<0.5	**0.7**
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	**1.1**	**17.8**	<0.5	**0.7**
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	**1.8**	**8.9**	<0.5	**0.6**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**106**	**103**	**105**	**112**	**102**
2-Chlorophenol-D4	93951-73-6	0.1	%	**102**	**96.3**	**99.2**	**94.5**	**95.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**29.5**	**42.7**	**41.5**	**47.8**	**45.4**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**100**	**93.8**	**97.2**	**102**	**94.3**
Anthracene-d10	1719-06-8	0.1	%	**104**	**99.3**	**101**	**106**	**94.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**116**	**112**	**116**	**95.8**	**77.3**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**101**	**97.6**	**130**	**110**	**108**
Toluene-D8	2037-26-5	0.1	%	**112**	**104**	**115**	**104**	**104**
4-Bromofluorobenzene	460-00-4	0.1	%	**117**	**110**	**121**	**113**	**97.6**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH408_9.0-9.4	QC613	----	----	----
				Client sampling date / time: 15-FEB-2011 15:00	15-FEB-2011 15:00	----	----	----
				ES1103336-013	ES1103336-014	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**17.2**	**16.3**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	**8**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**20**	**20**	----	----	----
Copper	7440-50-8	5	mg/kg	<5	<5	----	----	----
Lead	7439-92-1	5	mg/kg	**5**	**6**	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	<5	<5	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	**89.8**	**23.8**	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	**22.9**	**6.6**	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	**4.2**	**1.1**	----	----	----
Fluorene	86-73-7	0.5	mg/kg	**16.6**	**4.8**	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	**38.8**	**11.7**	----	----	----
Anthracene	120-12-7	0.5	mg/kg	**12.5**	**3.9**	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	**14.5**	**4.2**	----	----	----
Pyrene	129-00-0	0.5	mg/kg	**18.3**	**5.2**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	**9.7**	**2.5**	----	----	----
Chrysene	218-01-9	0.5	mg/kg	**7.6**	**1.9**	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	**4.6**	**1.1**	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	**2.3**	**0.5**	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	**5.6**	**1.4**	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	**2.0**	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	**0.6**	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	**2.6**	**0.6**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	**24**	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg	**360**	**110**	----	----	----
C15 - C28 Fraction	----	100	mg/kg	**710**	**260**	----	----	----
C29 - C36 Fraction	----	100	mg/kg	**150**	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	**1220**	**370**	----	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	**2.1**	**0.5**	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH408_9.0-9.4	QC613	----	----	----
				Client sampling date / time: 15-FEB-2011 15:00	15-FEB-2011 15:00	----	----	----
				ES1103336-013	ES1103336-014	----	----	----
EP080: BTEX - Continued								
Ethylbenzene	100-41-4	0.5	mg/kg	**4.6**	**1.0**	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	**5.1**	**1.2**	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	**3.8**	**1.0**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**112**	**105**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**95.9**	**98.2**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**40.0**	**41.2**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**91.8**	**94.7**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**96.0**	**97.7**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**113**	**110**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**110**	**96.4**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**104**	**102**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**105**	**110**	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC612	----	----	----	----
				Client sampling date / time: 15-FEB-2011 15:00	----	----	----	----
				ES1103336-007	**----**	**----**	**----**	**----**
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC612	----	----	----	----
				Client sampling date / time: 15-FEB-2011 15:00	----	----	----	----
				ES1103336-007	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**19.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**37.1**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**51.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**53.7**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**57.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**46.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**83.3**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**117**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**99.2**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Chain of Custody

COC # 6 page 1 of 1

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: HOLD	PAHs	TPH / BTEX	METALS (8)	ASBESTOS	Other
1	BH409_1.0-1.3	14-2-11	—	X					X		250mL	X					
2	BH409_3.7-4.0	14.2.11	—	X					X		150 ml	X					
3	BH409_4.1-4.3	14-2-11	—	X					X		↓	X					
4	BH409_5.0-5.3	14-2-11	—	X					X		↓	X					
5	BH409_6.0-6.4	15-2-11	—	X					X		250mL	X					
6	BH409_7.0-7.3	15-2-11	—	X					X		150mL	X					
7	QC612	15-2-11	—		X				X		*		X	X	X		
8	BH408_1.0-1.4	14-2-11	—	X					X		250mL	X					
9	BH408_2.0-2.4	14.2.11	—	X					X		250mL	X					
10	BH408_4.0-4.4	14-2-11	—	X					X		150mL	X					
11	BH408_5.0-5.18	15-2-11	—	X					X		zip lock bag	X					
12	BH408_8.0-8.3	15-2-11	—	X					X		250mL	X					
13	BH408_9.0-9.4	15-2-11	—	X					X		150mL	X					
14	~~BH~~ QC613	15-2-11	—	X					X		150mL	X					

Environmental Division Sydney
Work Order
ES1103336
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * 2 vials, 1-150mL amber, 1 plastic

Lab Report No. | Esky ID

Relinquished by: Lauren Kontus Signed: 15-2-11 Date: 15/02/2011 17:00 p.m.

Recieved by: Taylor Mitchell Signed: 15/2/11 Date:

Printed copies of this document are uncontrolled

Relinquished by: Signed: Date:

Recieved by: Signed: Date:

Chain of Custody

COC # 6 Labmark page 1 of 1

AECOM

AECOM - Sydney		
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999	
	Fax: 61 2 8484 8989	
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com	
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1	

Laboratory Details

Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:

Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	METALS (8)	PAHs	ASBESTOS	Other
	QC614	15-2-11	-	X					X		150mL	X					

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus — Signed: — Date: 15-2-11

Recieved by: — Signed: — Date:

Relinquished by: — Signed: — Date:

Recieved by: — Signed: — Date:

Fadi Soro

Fadi 16/2/11 12:45pm

From: Jennifer Cullen
Sent: Wednesday, 16 February 2011 11:09 AM
To: Fadi Soro; Samples Sydney
Cc: Wael Saleh
Subject: FW: Analysis Request - Barangaroo - 60153531/6.1
Importance: High

Hi Fadi,

As discussed could you please use the below information to log the samples received from AECOM yesterday?

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen
SENIOR PROJECT MANAGER

ALS | Environmental Division

Address
277-289 Woodpark Road, Smithfield, NSW, 2164

PHONE +61 2 8784 8555
DIRECT +61 2 8784 8509
FAX +61 2 8784 8500

www.alsglobal.com

Please consider the environment before printing this email.

From: O'Brien, Kate [mailto:Kate.O'Brien@aecom.com]
Sent: Wednesday, 16 February 2011 11:05 AM
To: Jennifer Cullen
Cc: Davis, Anthony
Subject: Analysis Request - Barangaroo - 60153531/6.1

Hi Jenny,

Could we please get the following samples (which were delivered to the lab yesterday afternoon– 15 Feb) analysed:

BH409_1.0-1.3 – asbestos

BH409_3.7-4.0 – PAHs, Metals (8), TPH/BTEX

BH409_5.0-5.3 – PAHs, Metals (8), TPH/BTEX

BH409_7.0-7.3 - PAHs, Metals (8), TPH/BTEX

BH408_1.0-1.4 - PAHs, Metals (8), TPH/BTEX

BH408_2.0-2.4 - asbestos

BH408_8.0-8.3 - PAHs, Metals (8), TPH/BTEX

BH408_9.0-9.4 - PAHs, Metals (8), TPH/BTEX

QC613 - PAHs, Metals (8), TPH/BTEX

Regards,

Kate O'Brien
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
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SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1103336**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	Page	: 1 of 3
Order number	: 39540 AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 15-FEB-2011	Issue Date	: 18-FEB-2011 09:21
Client Requested Due Date	: 24-FEB-2011	Scheduled Reporting Date	: **24-FEB-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.9'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 14
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.
- Asbestos analysis will be subcontracted to ASET.
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample id BH408_1.0-1.4 received damaged during transit. Please contact ALS for further information.**
- **Additional analysis added to sample BH408_2.0-2.4 as per Kate O'Brien 17/2/11.**
- **Sample id QC614 sent to Labmark as per COC**
- **Sample id QC666 received extra and placed on hold, please confrim**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - ASB-SOL (Subcontracted) Asbestos - Count (Solid)	SOIL - S-26 8 metals/TPH/BTEX/PAH
ES1103336-001	14-FEB-2011 15:00	BH409_1.0-1.3		✓	
ES1103336-002	14-FEB-2011 15:00	BH409_3.7-4.0			✓
ES1103336-003	14-FEB-2011 15:00	BH409_4.1-4.3	✓		
ES1103336-004	14-FEB-2011 15:00	BH409_5.0-5.3			✓
ES1103336-005	15-FEB-2011 15:00	BH409_6.0-6.4	✓		
ES1103336-006	15-FEB-2011 15:00	BH409_7.0-7.3			✓
ES1103336-009	14-FEB-2011 15:00	BH408_2.0-2.4		✓	✓
ES1103336-010	14-FEB-2011 15:00	BH408_4.0-4.4	✓		
ES1103336-011	15-FEB-2011 15:00	BH408_5.0-5.18	✓		
ES1103336-012	15-FEB-2011 15:00	BH408_8.0-8.3			✓
ES1103336-013	15-FEB-2011 15:00	BH408_9.0-9.4			✓
ES1103336-014	15-FEB-2011 15:00	QC613			✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) WATER No analysis requested	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1103336-007	15-FEB-2011 15:00	QC612		✓
ES1103336-015	14-FEB-2011 15:00	QC666	✓	

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com
- Attachment - Report (SUBCO)	Email	accountsenv@aecom.com
MR ANTHONY DAVIS		
- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Attachment - Report (SUBCO)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com
MS JENNIFER CULLEN		
- Attachment - Report (SUBCO)	Email	jennifer.cullen@alsenviro.com
- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com
MS KATE O BRIEN		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Attachment - Report (SUBCO)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com
MS KATE PIGRAM		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Attachment - Report (SUBCO)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1103336**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 15-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Order number	: 39540 AUS		
		No. of samples received	: 14
Quote number	: SY/418/10 V2	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*
Alex Rossi	Organic Chemist	Organics
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Luke Witham	Senior Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist	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: 1676101)									
ES1103301-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	1.3	1.5	13.8	No Limit
ES1103336-014	QC613	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	16.3	16.9	3.1	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1676247)									
ES1102973-017	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	17	16	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	13	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	32	21	40.8	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	31	35	13.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	30	4.6	No Limit
ES1103336-002	BH409_3.7-4.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	20	25.2	0% - 50%
		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	6	6	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	6	29.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1676248)									
ES1102973-017	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	<0.1	0.0	No Limit
ES1103336-002	BH409_3.7-4.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1673691)									
ES1103336-002	BH409_3.7-4.0	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

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: 1673691) - continued									
ES1103336-002	BH409_3.7-4.0	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: 1674753)									
ES1102875-027	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	1.8	<0.5	113	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	39.4	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.2	1.1	68.6	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.3	1.1	71.8	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.8	0.7	85.8	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	1.5	0.6	86.3	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.7	0.7	81.8	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.8	<0.5	49.8	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.6	0.6	82.2	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.8	<0.5	44.4	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	1.0	<0.5	66.4	No Limit
ES1103136-042	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
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1673690)									
ES1103336-002	BH409_3.7-4.0	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

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: 1673690) - continued									
ES1103339-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674546)									
ES1102875-027	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674748)									
ES1103042-022	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674752)									
ES1102875-027	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
ES1103136-042	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: 1674546)									
ES1102875-027	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: BTEX (QC Lot: 1674748)									
ES1103042-022	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: 1676083)									
ES1103309-003	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.020	0.020	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.016	0.017	7.0	0% - 50%
		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	0.002	0.003	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.539	0.539	0.0	0% - 20%
ES1103354-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 1676083) - continued									
ES1103354-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.104	0.102	1.3	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 1676082)									
ES1103309-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1103336-007	QC612	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1674557)									
ES1103373-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1103373-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	70	90	15.2	No Limit
EP080: BTEX (QC Lot: 1674557)									
ES1103373-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
ES1103373-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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	5	4	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
EG005T: Total Metals by ICP-AES (QCLot: 1676247)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	114	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	95.1	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	103	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	102	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	98.1	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	105	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	92.6	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	80.6	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1673691)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	112	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	109	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	110	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	111	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	106	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	107	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	103	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	111	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	91.6	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.5	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	104	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	# 116	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	109	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	86.6	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	105	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	109	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	# 112	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	111	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	# 114	78.8	113

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753) - continued								
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	# 117	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	107	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	113	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	95.2	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	105	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	104	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	105	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	102	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1673690)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	98.2	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	105	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	101	72.6	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674546)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	106	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674748)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	90.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	110	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	98.1	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.8	72.6	117
EP080: BTEX (QCLot: 1674546)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	92.6	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.6	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	106	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	104	63	117
EP080: BTEX (QCLot: 1674748)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.1	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.0	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.3	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	97.9	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.6	63	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High

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: 1676083)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.9	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.7	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.3	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.6	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.0	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.6	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.6	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1676082)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	108	86	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674041)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	70.0	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	81.4	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	76.0	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	78.4	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	88.6	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	86.7	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	92.5	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	102	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	87.8	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	89.2	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	95.4	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	102	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	83.3	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	80.0	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	82.0	61.2	117
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674041) - continued								
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	85.8	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674040)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	74.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	92.1	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	76.5	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674557)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	89.9	75	127
EP080: BTEX (QCLot: 1674557)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	79.6	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	83.2	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	80.9	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	71.9	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	78.3	73	121

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: 1676247)							
ES1102973-017	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	101	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	90.3	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.9	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	96.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	85.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1676248)							
ES1102973-017	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1673691)							
ES1103336-002	BH409_3.7-4.0	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	105	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	99.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1674753)							
ES1102875-027	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	122	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	98.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1673690)							
ES1103336-002	BH409_3.7-4.0	EP071: C10 - C14 Fraction	----	640 mg/kg	113	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	93.5	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	97.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674546)							
ES1102875-027	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	83.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674748)							
ES1103042-022	Anonymous	EP080: C6 - C9 Fraction	----	26 mg/kg	85.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674752)							
ES1102875-027	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	100	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	87.6	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	76.3	70	130
EP080: BTEX (QCLot: 1674546)							
ES1102875-027	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	85.4	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	84.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.8	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
EP080: BTEX (QCLot: 1674546) - continued							
ES1102875-027	Anonymous	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	91.1	70	130
EP080: BTEX (QCLot: 1674748)							
ES1103042-022	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	91.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	93.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	102	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	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: 1676083)							
ES1103309-006	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	92.8	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	91.2	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	84.2	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	83.8	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	81.8	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	88.6	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	# Not Determined	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1676082)							
ES1103309-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	102	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1674557)							
ES1103373-001	Anonymous	EP080: C6 - C9 Fraction	----	250 µg/L	95.2	70	130
EP080: BTEX (QCLot: 1674557)							
ES1103373-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	84.9	70	130
		EP080: Toluene	108-88-3	25 µg/L	86.8	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	82.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	80.4	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	82.1	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1103336**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 15-FEB-2011
Sampler	: LK/KO	Issue Date	: 24-FEB-2011
Order number	: 39540 AUS		
		No. of samples received	: 14
Quote number	: SY/418/10 V2	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								
BH409_3.7-4.0,	BH409_5.0-5.3,	**14-FEB-2011**	**----**	----	----	**19-FEB-2011**	28-FEB-2011	✓
BH408_2.0-2.4								
Soil Glass Jar - Unpreserved								
BH409_7.0-7.3,	BH408_8.0-8.3,	**15-FEB-2011**	**----**	----	----	**19-FEB-2011**	01-MAR-2011	✓
BH408_9.0-9.4,	QC613							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH409_3.7-4.0,	BH409_5.0-5.3,	**14-FEB-2011**	**20-FEB-2011**	13-AUG-2011	✓	**21-FEB-2011**	13-AUG-2011	✓
BH408_2.0-2.4								
Soil Glass Jar - Unpreserved								
BH409_7.0-7.3,	BH408_8.0-8.3,	**15-FEB-2011**	**20-FEB-2011**	14-AUG-2011	✓	**21-FEB-2011**	14-AUG-2011	✓
BH408_9.0-9.4,	QC613							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH409_3.7-4.0,	BH409_5.0-5.3,	**14-FEB-2011**	**20-FEB-2011**	14-MAR-2011	✓	**21-FEB-2011**	14-MAR-2011	✓
BH408_2.0-2.4								
Soil Glass Jar - Unpreserved								
BH409_7.0-7.3,	BH408_8.0-8.3,	**15-FEB-2011**	**20-FEB-2011**	15-MAR-2011	✓	**21-FEB-2011**	15-MAR-2011	✓
BH408_9.0-9.4,	QC613							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH409_3.7-4.0,	BH409_5.0-5.3	**14-FEB-2011**	**17-FEB-2011**	28-FEB-2011	✓	**18-FEB-2011**	29-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH408_2.0-2.4		**14-FEB-2011**	**18-FEB-2011**	28-FEB-2011	✓	**18-FEB-2011**	30-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH409_7.0-7.3,	BH408_8.0-8.3,	**15-FEB-2011**	**17-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	29-MAR-2011	✓
BH408_9.0-9.4,	QC613							

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 BH409_3.7-4.0, BH409_5.0-5.3	**14-FEB-2011**	**17-FEB-2011**	28-FEB-2011	✓	**18-FEB-2011**	29-MAR-2011	✓
Soil Glass Jar - Unpreserved BH409_3.7-4.0, BH409_5.0-5.3, BH408_2.0-2.4	**14-FEB-2011**	**18-FEB-2011**	28-FEB-2011	✓	**18-FEB-2011**	28-FEB-2011	✓
Soil Glass Jar - Unpreserved BH409_7.0-7.3, BH408_8.0-8.3, BH408_9.0-9.4, QC613	**15-FEB-2011**	**17-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	29-MAR-2011	✓
Soil Glass Jar - Unpreserved BH409_7.0-7.3, BH408_8.0-8.3, BH408_9.0-9.4, QC613	**15-FEB-2011**	**18-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	01-MAR-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved BH409_3.7-4.0, BH409_5.0-5.3, BH408_2.0-2.4	**14-FEB-2011**	**18-FEB-2011**	28-FEB-2011	✓	**18-FEB-2011**	28-FEB-2011	✓
Soil Glass Jar - Unpreserved BH409_7.0-7.3, BH408_8.0-8.3, BH408_9.0-9.4, QC613	**15-FEB-2011**	**18-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	01-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
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered QC612	**15-FEB-2011**	**---**	14-AUG-2011	----	**20-FEB-2011**	14-AUG-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered QC612	**15-FEB-2011**	**---**	15-MAR-2011	----	**22-FEB-2011**	15-MAR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC612	**15-FEB-2011**	**18-FEB-2011**	22-FEB-2011	✓	**21-FEB-2011**	30-MAR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved QC612	**15-FEB-2011**	**18-FEB-2011**	22-FEB-2011	✓	**19-FEB-2011**	30-MAR-2011	✓
Amber VOC Vial - HCl QC612	**15-FEB-2011**	**18-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	01-MAR-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl QC612	**15-FEB-2011**	**18-FEB-2011**	01-MAR-2011	✓	**18-FEB-2011**	01-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)							
Moisture Content	EA055-103	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	3	28	**10.7**	**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	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	28	**7.1**	**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	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	10	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	28	**7.1**	**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	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	10	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	28	**7.1**	**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	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	10	**20.0**	**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	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	**11.1**	**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	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**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: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	5	**20.0**	**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	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**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
Asbestos - Count (Solid)	ASB-SOL	SOIL	Asbestos Count on solid matrices using PLM conducted by Subcontracting Laboratory
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)
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
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 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	1967444-007	----	**Fluorene**	86-73-7	112 %	79.9-112%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Fluoranthene**	206-44-0	114 %	78.8-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1967444-007	----	**Pyrene**	129-00-0	117 %	78.9-113%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1966245-007	----	**Indeno(1.2.3.cd)pyrene**	193-39-5	116 %	71-113%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	ES1103309-006	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **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.**

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET25354/ 28534 / 1 - 2
Your ref : ES1103336
NATA Accreditation No: 14484

22 February 2011

Australian Laboratory Services Pty Ltd
277, Woodpark Road
Smithfield NSW 2164

Attn: Mr Victor Kedicioglu

Dear Victor,

Asbestos Identification
This report presents the results of two samples, forwarded by Australian Laboratory Services Pty Ltd on 17 February 2011, for analysis for asbestos.

1.Introduction: Two samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining Method **(Safer Environment Method 1.)**

3. Results : **Sample No. 1. ASET25354 / 28534 / 1. ES1103336 - BH409 - 1.0 - 1.3**
Approx dimensions 6.2 cm x 5.8 cm x 4.2 cm
The sample consisted of a mixture of sandy soil, stones, plant matter, fragments of plaster, and brick.
No asbestos detected.

Sample No. 2. ASET25354 / 28534 / 2. ES1103336 - BH408 - 2.0 - 2.4
Approx dimensions 6.8 cm x 6.4 cm x 5.2 cm
The sample consisted of a mixture of sandy soil and stones.
No asbestos detected.

Analysed and reported by,

Laxman Dias. BSc.
Approved Identifier / Analyst.
Approved Signatory.

NATA
WORLD RECOGNISED
ACCREDITATION

This document is issued in accordance with NATA's Accreditation requirements. Accredited for compliance with ISO/IEC 17025.

CERTIFICATE OF ANALYSIS

Work Order	: **ES1103957**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Site	: ----		
		No. of samples received	: 5
Quote number	: SY/418/10 V2	No. of samples analysed	: 5

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Luke Witham	Senior Inorganic Chemist	Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP132: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Surrogate was not determined due to sample matrix interferences.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH406_16.0-16.5	BH409_3.7-4.0
				Client sampling date / time	09-FEB-2011 15:00	09-FEB-2011 15:00	10-FEB-2011 15:00	09-FEB-2011 15:00	14-FEB-2011 15:00
					ES1103957-001	ES1103957-002	ES1103957-003	ES1103957-004	ES1103957-005
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		**9.1**	**8.2**	**9.0**	**6.0**	**8.8**
After HCl pH	----	0.1	pH Unit		**1.8**	**1.6**	**1.6**	**1.6**	**1.6**
Extraction Fluid Number	----	1	-		**1**	**1**	**1**	**1**	**1**
Final pH	----	0.1	pH Unit		**6.4**	**4.9**	**4.9**	**4.8**	**4.9**

Analytical Results

Sub-Matrix: **TCLP LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH406_16.0-16.5	BH409_3.7-4.0
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103957-001	ES1103957-002	ES1103957-003	ES1103957-004	ES1103957-005
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	**0.2**	<0.1	<0.1
Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	7440-66-6	0.1	mg/L	**1.1**	**1.6**	**0.8**	**0.2**	**0.4**
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0010	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<5.00	<0.05	<5.00	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<5.00	<0.05	<5.00	<0.05
m-Cresol	108-39-4	0.1	µg/L	**2.7**	**10200**	**5.7**	**1830**	**5.9**
o-Cresol	95-48-7	0.1	µg/L	**1.8**	**8680**	**4.4**	**1740**	**5.5**
p-Cresol	106-44-5	0.1	µg/L	**0.5**	**8680**	**3.8**	**1580**	**4.5**
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2.4-Dimethylphenol	105-67-9	0.1	µg/L	**16.4**	**4470**	**7.8**	**1280**	**13.4**
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<5.00	<0.05	<5.00	<0.05
Phenol	108-95-2	0.1	µg/L	**0.7**	**8040**	**3.0**	**158**	**0.6**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	**53.6**	**1010**	**11.5**	**642**	**31.6**
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Acenaphthene	83-32-9	0.1	µg/L	**19.8**	**59.0**	**1.2**	**40.3**	**3.8**
Acenaphthylene	208-96-8	0.1	µg/L	**23.6**	**562**	**6.8**	**366**	**16.6**
Anthracene	120-12-7	0.1	µg/L	**8.6**	**40.3**	**1.5**	**23.0**	**4.8**
Benz(a)anthracene	56-55-3	0.1	µg/L	**0.5**	<10.0	<0.1	<10.0	**0.2**
Benzo(a)pyrene	50-32-8	0.05	µg/L	**0.06**	<5.00	<0.05	<5.00	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	**0.1**	<10.0	<0.1	<10.0	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1

Analytical Results

Sub-Matrix: **TCLP LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH406_16.0-16.5	BH409_3.7-4.0
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103957-001	ES1103957-002	ES1103957-003	ES1103957-004	ES1103957-005
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Chrysene	218-01-9	0.1	µg/L	**0.4**	<10.0	<0.1	<10.0	**0.1**
Coronene	191-07-1	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Fluoranthene	206-44-0	0.1	µg/L	**6.4**	**17.6**	**1.1**	<10.0	**3.3**
Fluorene	86-73-7	0.1	µg/L	**37.0**	**188**	**5.7**	**128**	**17.2**
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Naphthalene	91-20-3	0.1	µg/L	**342**	**17700**	**58.3**	**9060**	**150**
Perylene	198-55-0	0.1	µg/L	<0.1	<10.0	<0.1	<10.0	<0.1
Phenanthrene	85-01-8	0.1	µg/L	**39.0**	**167**	**7.2**	**98.7**	**20.0**
Pyrene	129-00-0	0.1	µg/L	**5.7**	**13.8**	**0.8**	<10.0	**2.2**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**73.6**	**Not Determined**	**76.0**	**Not Determined**	**48.7**
Phenol-d6	13127-88-3	0.1	%	**49.1**	**Not Determined**	**51.5**	**Not Determined**	**32.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**96.7**	**Not Determined**	**119**	**Not Determined**	**114**
2.4.6-Tribromophenol	118-79-6	0.1	%	**125**	**Not Determined**	**115**	**Not Determined**	**99.8**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**115**	**Not Determined**	**106**	**Not Determined**	**116**
Anthracene-d10	1719-06-8	0.1	%	**102**	**Not Determined**	**104**	**Not Determined**	**89.7**
4-Terphenyl-d14	1718-51-0	0.1	%	**109**	**Not Determined**	**107**	**Not Determined**	**96.8**

Surrogate Control Limits

Sub-Matrix: **TCLP LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Results Due Thursday 3/3/11.

UT Phenols added as per Clay Smith 24/2/11

ES1103960

Fadi Soro

Subcon / Forward Lab / Split WO FADI

Lab / Analysis:

Organised By / Date:

Relinquished By / Date: 24/2/11 1pm

Connote / Courier:

WO No: ES1103957

Quote Ref / Internal Sheet:

From: Jennifer Cullen
Sent: Thursday, 24 February 2011 11:41 AM
To: Samples Sydney; Fadi Soro
Cc: Nanthini Coilparampil
Subject: FW: Additional Analysis Required for Batch ES1102973
Importance: High

URGENT

TCLP only

Environmental Division Sydney Work Order **ES1103957**

Telephone : +61-2-8784 8555

Hi Fadi,

Confirmation has been received from AECOM on required analysis as per the below email cl
ahead with the rebatch of these samples as per the following table:

Results are to be reported on Thursday 3/3/11.

	Lab Sample	Field ID	Sample Date	Volume Remaining (g)	Analysis
(1)	ES1102973-002	BH403_8.0-8.4		~200	ASLP and TCLP 8 metals and ultra trace PAH + ultra trace phenols.
(2)	ES1102973-003	BH403_12.0-12.4	9-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + ultra trace phenols
(3)	ES1103042-008	BH405_7.0-7.3	10-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + ultra trace phenols
	ES1103042-012	BH405_14.0-14.4	11-Feb-11	~150	ASLP 8 metals and ultra trace PAH + ultra trace phenols
	ES1102875-003	BH406_7.0-7.4	8-Feb-11	~150	ASLP 8 metals and ultra trace PAH + ultra trace phenols
(4)	ES1102875-015	BH406_16.0-16.5	9-Feb-11	~150-200	ASLP and TCLP 8 metals and ultra trace PAH + ultra trace phenols.
	ES1103336-009	BH408_2.0-2.4	14-Feb-11	~150	ASLP 8 metals and ultra trace PAH + ultra trace phenols
	ES1103336-013	BH408_9.0-9.4	15-Feb-11	~150	ASLP 8 metals and ultra trace PAH + ultra trace phenols
(5)	ES1103336-002	BH409_3.7-4.0	14-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + ultra trace phenols
	ES1103336-006	BH409_7.0-7.3	15-Feb-11	~150	ASLP 8 metals and ultra trace PAH + ultra trace phenols.

S- 446

Kamalini 3.40. 24/2/11

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1103957**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 24-FEB-2011	Issue Date	: 24-FEB-2011 17:55
Client Requested Due Date	: 03-MAR-2011	Scheduled Reporting Date	: **03-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.0'C
No. of coolers/boxes	: REBATCH	No. of samples received	: 5
Security Seal	: Not intact.	No. of samples analysed	: 5

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.**
- **THIS BATCH SPLIT INTO ES1103960 (ASLP)**
- **Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **This is a rebatch of ES1102973, ES1103042, ES1102875, ES1103336.**
- **Holding times on Leach for Semi-volatile analysis is 14 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EP132AB Ultra Trace PAH/Phenolic Compounds	SOIL - TCLP TCLP Leach	SOIL - W-02L 8 metals (TCLP)
ES1103957-001	09-FEB-2011 15:00	BH403_8.0-8.4		✓	
	24-FEB-2011 15:00	BH403_8.0-8.4	✓		✓
ES1103957-002	09-FEB-2011 15:00	BH403_12.0-12.4		✓	
	24-FEB-2011 15:00	BH403_12.0-12.4	✓		✓
ES1103957-003	10-FEB-2011 15:00	BH405_7.0-7.3		✓	
	24-FEB-2011 15:00	BH405_7.0-7.3	✓		✓
ES1103957-004	09-FEB-2011 15:00	BH406_16.0-16.5		✓	
	24-FEB-2011 15:00	BH406_16.0-16.5	✓		✓
ES1103957-005	14-FEB-2011 15:00	BH409_3.7-4.0		✓	
	24-FEB-2011 15:00	BH409_3.7-4.0	✓		✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MR GARRY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	garry.smith@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	garry.smith@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	garry.smith@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	garry.smith@aecom.com
- Chain of Custody (CoC) (COC)	Email	garry.smith@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	garry.smith@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	garry.smith@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	garry.smith@aecom.com
- EDI Format - XTab (XTAB)	Email	garry.smith@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1103957**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
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Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 5
Quote number	: SY/418/10 V2	No. of samples analysed	: 5

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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Luke Witham	Senior Inorganic Chemist	Inorganics

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005C: Leachable Metals by ICPAES (QC Lot: 1686485)									
ES1103754-001	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	7.7	8.1	4.7	0% - 20%
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Zinc	7440-66-6	0.1	mg/L	1.0	1.0	0.0	0% - 50%
ES1103883-001	Anonymous	EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.0	No Limit
		EG005C: Zinc	7440-66-6	0.1	mg/L	1.8	1.8	0.0	0% - 50%
EG035C: Leachable Mercury by FIMS (QC Lot: 1686466)									
ES1103754-001	Anonymous	EG035C: Mercury	7439-97-6	0.0010	mg/L	0.0428	0.0375	13.2	0% - 20%
ES1103883-002	Anonymous	EG035C: Mercury	7439-97-6	0.0010	mg/L	<0.0010	<0.0010	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 1686485)								
EG005C: Arsenic	7440-38-2	0.1	mg/L	<0.1	0.1 mg/L	101	70	130
EG005C: Cadmium	7440-43-9	0.05	mg/L	<0.05	0.1 mg/L	103	70	130
EG005C: Chromium	7440-47-3	0.1	mg/L	<0.1	0.1 mg/L	95.4	70	130
EG005C: Copper	7440-50-8	0.1	mg/L	<0.1	0.1 mg/L	95.0	70	130
EG005C: Lead	7439-92-1	0.1	mg/L	<0.1	0.1 mg/L	84.1	70	130
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	98.9	70	130
EG005C: Zinc	7440-66-6	0.1	mg/L	<0.1	0.1 mg/L	102	70	130
EG035C: Leachable Mercury by FIMS (QCLot: 1686466)								
EG035C: Mercury	7439-97-6	0.001	mg/L	<0.0010	0.010 mg/L	104	83	119
EP132A: Phenolic Compounds (QCLot: 1686729)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	98.7	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	101	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	70.5	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	78.5	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	74.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	96.6	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	95.4	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	99.0	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	57.0	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	103	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	49.3	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	71.9	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	47.8	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	96.2	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	91.2	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	100	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	98.5	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	80.4	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	103	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	84.7	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	86.9	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	91.3	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	94.2	73.6	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729) - continued								
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	98.4	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	103	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	92.1	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	108	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	98.6	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	93.5	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	102	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	116	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	100	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	95.0	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	112	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	79.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	84.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	94.8	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	93.9	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	100	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005C: Leachable Metals by ICPAES (QCLot: 1686485)							
ES1103754-002	Anonymous	EG005C: Arsenic	7440-38-2	1 mg/L	104	70	130
		EG005C: Cadmium	7440-43-9	0.250 mg/L	98.3	70	130
		EG005C: Chromium	7440-47-3	1 mg/L	93.0	70	130
		EG005C: Copper	7440-50-8	1 mg/L	109	70	130
		EG005C: Lead	7439-92-1	1 mg/L	104	70	130
		EG005C: Nickel	7440-02-0	1 mg/L	95.2	70	130
		EG005C: Zinc	7440-66-6	1 mg/L	99.7	70	130
EG035C: Leachable Mercury by FIMS (QCLot: 1686466)							
ES1103754-006	Anonymous	EG035C: Mercury	7439-97-6	0.100 mg/L	112	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1103957**	Page	: 1 of 6
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
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Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 5
Quote number	: SY/418/10 V2	No. of samples analysed	: 5

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
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH406_16.0-16.5, BH409_3.7-4.0	**27-FEB-2011**	**28-FEB-2011**	26-AUG-2011	✓	**28-FEB-2011**	26-AUG-2011	✓
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH406_16.0-16.5, BH409_3.7-4.0	**27-FEB-2011**	**----**	----	----	**28-FEB-2011**	27-MAR-2011	✓
EN33: TCLP Leach							
LabSplit: Leach for organics and other tests							
BH403_8.0-8.4, BH403_12.0-12.4, BH406_16.0-16.5	**09-FEB-2011**	**---**	23-FEB-2011	----	**27-FEB-2011**	23-FEB-2011	×
LabSplit: Leach for organics and other tests							
BH405_7.0-7.3	**10-FEB-2011**	**---**	24-FEB-2011	----	**27-FEB-2011**	24-FEB-2011	×
LabSplit: Leach for organics and other tests							
BH409_3.7-4.0	**14-FEB-2011**	**---**	28-FEB-2011	----	**27-FEB-2011**	28-FEB-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH406_16.0-16.5, BH409_3.7-4.0	**27-FEB-2011**	**26-FEB-2011**	06-MAR-2011	✓	**01-MAR-2011**	09-APR-2011	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH406_16.0-16.5, BH409_3.7-4.0	**27-FEB-2011**	**26-FEB-2011**	06-MAR-2011	✓	**01-MAR-2011**	09-APR-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: **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)							
Leachable Mercury by FIMS	EG035C	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Leachable Metals by ICPAES	EG005C	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Leachable Mercury by FIMS	EG035C	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Leachable Metals by ICPAES	EG005C	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Leachable Mercury by FIMS	EG035C	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Leachable Metals by ICPAES	EG005C	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Leachable Mercury by FIMS	EG035C	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Leachable Metals by ICPAES	EG005C	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
Leachable Metals by ICPAES	EG005C	SOIL	APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Leachable Mercury by FIMS	EG035C	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. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. 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)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	(USEPA SW846-1311, ALS QWI-EN/33) The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	SOIL	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

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

- **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

Sub-Matrix: **TCLP LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132S: Acid Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-001	BH403_8.0-8.4	**2.4.6-Tribromophenol**	118-79-6	125 %	10-123 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-005	BH409_3.7-4.0	**2-Fluorobiphenyl**	321-60-8	116 %	43-116 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **TCLP LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1103957-002	BH403_12.0-12.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103957-004	BH406_16.0-16.5	**4-Terphenyl-d14**	1718-51-0	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.

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
EN33: TCLP Leach						
LabSplit: Leach for organics and other tests BH403_8.0-8.4, BH403_12.0-12.4, BH406_16.0-16.5	----	----	----	27-FEB-2011	23-FEB-2011	**4**
LabSplit: Leach for organics and other tests BH405_7.0-7.3	----	----	----	27-FEB-2011	24-FEB-2011	**3**

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.**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1103960**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Site	: ----		
		No. of samples received	: 10
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control 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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Luke Witham	Senior Inorganic Chemist	Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP132: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Surrogate was not determined due to sample matrix interferences.**

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH405_14.0-14.4	BH406_7.0-7.4
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103960-001	ES1103960-002	ES1103960-003	ES1103960-004	ES1103960-005
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.010**	<0.001	**0.002**	<0.001	**0.004**
Cadmium	7440-43-9	0.0001	mg/L	**0.0001**	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	**0.002**	**0.002**	**0.001**	<0.001	**0.001**
Copper	7440-50-8	0.001	mg/L	**0.009**	**0.001**	**0.002**	<0.001	**0.004**
Lead	7439-92-1	0.001	mg/L	**0.012**	**0.001**	**0.004**	<0.001	**0.008**
Nickel	7440-02-0	0.001	mg/L	**0.001**	<0.001	<0.001	<0.001	**0.002**
Zinc	7440-66-6	0.005	mg/L	**0.161**	**0.140**	**0.099**	**0.161**	**0.072**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.50	<0.05	<5.00	<5.00
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.50	<0.05	<5.00	<5.00
m-Cresol	108-39-4	0.1	µg/L	**0.9**	**5740**	**1.2**	**26.5**	<10.0
o-Cresol	95-48-7	0.1	µg/L	**0.8**	**4740**	**0.7**	**66.6**	<10.0
p-Cresol	106-44-5	0.1	µg/L	**0.4**	**4600**	**0.7**	**18.4**	<10.0
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2.4-Dimethylphenol	105-67-9	0.1	µg/L	**2.4**	**2210**	**3.7**	**271**	**113**
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.50	<0.05	<5.00	<5.00
Phenol	108-95-2	0.1	µg/L	**0.6**	**3700**	**0.7**	<10.0	<10.0
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
2-Methylnaphthalene	91-57-6	0.1	µg/L	**7.1**	**721**	**3.4**	**701**	**288**
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
Acenaphthene	83-32-9	0.1	µg/L	**18.4**	**38.2**	**0.4**	**52.2**	**139**
Acenaphthylene	208-96-8	0.1	µg/L	**10.0**	**404**	**1.9**	**381**	<10.0
Anthracene	120-12-7	0.1	µg/L	**5.4**	**32.2**	**0.7**	**29.7**	**36.5**
Benz(a)anthracene	56-55-3	0.1	µg/L	**0.6**	<1.0	<0.1	<10.0	<10.0
Benzo(a)pyrene	50-32-8	0.05	µg/L	**0.35**	<0.50	<0.05	<5.00	<5.00
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	**0.3**	<1.0	<0.1	<10.0	<10.0
Benzo(e)pyrene	192-97-2	0.1	µg/L	**0.2**	<1.0	<0.1	<10.0	<10.0
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	**0.2**	<1.0	<0.1	<10.0	<10.0

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH405_14.0-14.4	BH406_7.0-7.4
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103960-001	ES1103960-002	ES1103960-003	ES1103960-004	ES1103960-005
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	**0.2**	<1.0	<0.1	<10.0	<10.0
Chrysene	218-01-9	0.1	µg/L	**0.6**	<1.0	<0.1	<10.0	<10.0
Coronene	191-07-1	0.1	µg/L	**0.3**	<1.0	<0.1	<10.0	<10.0
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
Fluoranthene	206-44-0	0.1	µg/L	**7.4**	**11.2**	**0.8**	**13.1**	**19.0**
Fluorene	86-73-7	0.1	µg/L	**19.3**	**114**	**2.0**	**157**	**109**
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	**0.1**	<1.0	<0.1	<10.0	<10.0
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
Naphthalene	91-20-3	0.1	µg/L	**46.1**	**11300**	**13.9**	**10800**	**2510**
Perylene	198-55-0	0.1	µg/L	<0.1	<1.0	<0.1	<10.0	<10.0
Phenanthrene	85-01-8	0.1	µg/L	**31.4**	**117**	**3.2**	**123**	**162**
Pyrene	129-00-0	0.1	µg/L	**6.6**	**8.4**	**0.7**	<10.0	**17.0**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**75.0**	**Not Determined**	**68.1**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**60.8**	**Not Determined**	**52.2**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**128**	**Not Determined**	**122**	**Not Determined**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**118**	**80.5**	**115**	**Not Determined**	**Not Determined**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**108**	**82.8**	**112**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**108**	**122**	**108**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**130**	**95.1**	**115**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH406_16.0-16.5	BH408_2.0-2.4	BH408_9.0-9.4	BH409_3.7-4.0	BH409_7.0-7.3
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103960-006	ES1103960-007	ES1103960-008	ES1103960-009	ES1103960-010
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	**0.0002**	**0.0002**	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	**0.019**	**0.006**	<0.001
Copper	7440-50-8	0.001	mg/L	**0.001**	<0.001	**0.006**	**0.007**	<0.001
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	**0.005**	**0.002**	<0.001
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.028**	<0.001	<0.001
Zinc	7440-66-6	0.005	mg/L	**0.296**	**0.104**	**0.576**	**0.444**	**0.073**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<5.00	<0.05	<0.05	<0.05	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<5.00	<0.05	<0.05	<0.05	<0.05
m-Cresol	108-39-4	0.1	µg/L	**2740**	**2.2**	<0.1	**0.3**	**1.5**
o-Cresol	95-48-7	0.1	µg/L	**2600**	**2.0**	<0.1	**0.2**	**3.6**
p-Cresol	106-44-5	0.1	µg/L	**2300**	**1.7**	<0.1	**0.1**	**2.8**
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2.4-Dimethylphenol	105-67-9	0.1	µg/L	**2090**	**3.4**	<0.1	**0.6**	**2.7**
Hexachlorophene	70-30-4	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L	<5.00	<0.05	<0.05	<0.05	<0.05
Phenol	108-95-2	0.1	µg/L	**196**	**0.8**	<0.1	**0.2**	**1.2**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	**794**	**5.7**	**5.6**	**7.3**	**302**
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	**52.9**	**0.4**	**0.4**	**1.6**	**13.6**
Acenaphthylene	208-96-8	0.1	µg/L	**456**	**3.0**	**2.9**	**1.4**	**90.4**
Anthracene	120-12-7	0.1	µg/L	**29.7**	**0.8**	**0.2**	**1.2**	**11.7**
Benz(a)anthracene	56-55-3	0.1	µg/L	<10.0	<0.1	<0.1	**0.1**	**0.6**
Benzo(a)pyrene	50-32-8	0.05	µg/L	<5.00	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH406_16.0-16.5	BH408_2.0-2.4	BH408_9.0-9.4	BH409_3.7-4.0	BH409_7.0-7.3
				Client sampling date / time: 27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00	27-FEB-2011 12:00
				ES1103960-006	ES1103960-007	ES1103960-008	ES1103960-009	ES1103960-010
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	<10.0	<0.1	<0.1	**0.1**	**0.5**
Coronene	191-07-1	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L	**13.0**	**1.0**	<0.1	**1.2**	**6.0**
Fluorene	86-73-7	0.1	µg/L	**163**	**2.1**	**1.1**	**3.0**	**45.8**
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	**17700**	**36.7**	**23.7**	**16.3**	**862**
Perylene	198-55-0	0.1	µg/L	<10.0	<0.1	<0.1	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L	**126**	**3.2**	**1.0**	**5.4**	**63.0**
Pyrene	129-00-0	0.1	µg/L	<10.0	**0.9**	<0.1	**1.3**	**8.3**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**52.0**	**Not Determined**	**76.0**	**81.0**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**33.6**	**Not Determined**	**52.6**	**54.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**95.9**	**Not Determined**	**137**	**67.4**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**87.2**	**Not Determined**	**112**	**122**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**81.0**	**Not Determined**	**131**	**96.5**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**81.1**	**Not Determined**	**104**	**99.4**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**83.1**	**Not Determined**	**110**	**107**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH403_8.0-8.4	BH403_12.0-12.4	BH405_7.0-7.3	BH405_14.0-14.4	BH406_7.0-7.4
				Client sampling date / time	09-FEB-2011 15:00	09-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00	08-FEB-2011 15:00
					ES1103960-001	ES1103960-002	ES1103960-003	ES1103960-004	ES1103960-005
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		**9.0**	**8.4**	**9.4**	**8.7**	**9.5**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH406_16.0-16.5	BH408_2.0-2.4	BH408_9.0-9.4	BH409_3.7-4.0	BH409_7.0-7.3
				Client sampling date / time: 09-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00
				ES1103960-006	ES1103960-007	ES1103960-008	ES1103960-009	ES1103960-010
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	**7.7**	**6.7**	**7.9**	**8.6**	**6.7**

Surrogate Control Limits

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Chain of Custody

COC #5 page 1/3

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

Subcon / Forward Lab / Split WO — Yes (tick)
Lab / Analysis: Labmark / Newcastle
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By COC / Internal Sheet:

1. Urgent TAT required? (please circle: 24hr 48hr _____days)
2. Fast TAT Guarantee Required?
3. Is any sediment layer present in waters to be excluded from extractions?
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?
5. Special storage requirements? (details: _____)
6. Shell Quality Partnership:
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email : _____

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	HOLD	TRH / BTEX	PAHs	ASBESTOS	METALS (5)	Other
1	BH407_1.0-1.3	11.2.11	–	X					X		150mL				X		
2	BH407_5.0-5.1	11.2.11	–	X					X		↓	X					
3	BH407_8.0-8.1	14.2.11	–	X					X				X	X		X	
4	BH407_9.0-9.1	14.2.11	–	X					X			X					
5	BH407_12.0-12.18	14.2.11	–	X					X				X	X		X	
6	BH407_13.0-13.2	14.2.11	–	X					X		150mL	X					
7	BH407_14.0-14.5	14.2.11	–	X					X		150mL		X	X		X	
8	BH407_15.1-15.45	14.2.11	–	X					X		250mL	X					
9	BH407_16.3-16.5	14.2.11	–	X					X		250mL		X	X		X	
10	BH407_17.4-17.6	14.2.11	–	X					X		250mL		X	X		X	
11	BH407_18.0-18.3	14.2.11	–	X					X		250mL		X	X		X	
12	QC610	14.2.11	–	X					X		150mL		X	X		X	

Environmental Division Sydney
Work Order
ES1103100
Telephone : +61-2-8784 8555

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No. | Esky ID

Relinquished by: Lauren Kontus — Signed: — Date: 14-2-11 3pm
Recieved by: — Signed: — Date:

Relinquished by: — Signed: — Date:
Recieved by: Wanida — Signed: — Date: 14/2/11 16:30

COC #5 page 2/3

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/418/10 V2

Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr ____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: ____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	PAHs	ASBESTOS	METALS (8)	Other
13	BH400_2.0-2.4	11.2.11		X					X		250ml	X					
14	BH400_3.0-3.4										150ml	X					
15	BH400_4.0-4.4										150ml				X		
16	BH400_5.0-5.4										150ml	X					
17	BH400_6.0-6.4										250ml		X	X		X	
18	BH400_7.0-7.4	↓									250ml	X					
19	BH400_8.0-8.4	14.2.11									150ml	X					
20	BH400_9.0-9.4										"		X	X		X	
21	BH400_10-10.4										"	X					
22	BH400_11-11.4										"	X					
23	BH400_12-12.4										250ml		X	X		X	
24	BH400_13.2-13.4										"		X	X		X	
25	BH400_14-14.2										"		X	X		X	
26	BH400_15-15.4	↓		↓					↓		"		X	X		X	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus Kate O'Brien Signed:
Recieved by: Signed:
Date: 14/2/11

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Page 1 of 1

Relinquished by: Signed:
Recieved by: Wanida Signed: Georgia
Date:

Lab Report No.
Esky ID

BMS-PM-DV-F046 Revision: dart 00 (6.30)

COC #5 page 3/3

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/418/10 V2

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: frit'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: HOLD	TPH/BTEX	PAHs	Metals (8)	Other
27	BH402_16-16.4	14.2.11		X					X		250ml		X	X	X	* PID > 500 ppm
28	QC665	11.2.11			X						*		X	X	X	

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: * 2x vials, 1x metals, 1x Amber

Relinquished by: Lauren Kontus / Kate O'Brien Signed: 14/2/11
Recieved by: Signed: Date:

Relinquished by: Signed: Date:
Recieved by: Signed: 14/02/11

Lab Report No. Esky ID

COC #5 page 1/1

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

LABMARK

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Contact Name:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No & type)	HOLD	PAH	TPH/BTEX	METALS (6)	Other
	QC611	14/2/11		X					X		150ml		X	X	X	
	Please send QC611 to Labmark															

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date: Labmark
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus/Kate O'Brien Signed: Date: 14/2/11
Recieved by: Signed: Date:

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Page 1 of 1
BMS-PM-DV-F046

Relinquished by: Signed: Date:
Recieved by: Wonda Signed: 140311 16:30

Lab Report No | Esky ID

Revision: Jun 08

Results due 3/3/11

UT Phenols added as per Cary Smith 24/2/11

Fadi Soro

From: Jennifer Cullen
Sent: Thursday, 24 February 2011 11:41
To: Samples Sydney; Fadi Soro
Cc: Nanthini Coilparampil
Subject: FW: Additional Analysis Request - Barangaroo
Importance: High

Environmental Division Sydney
Work Order
ES1103960

Telephone : +61-2-8784 8555

Fadi 24/2/11 1pm

ES1103957

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES1103960
Attach By PO / Internal Sheet:

URGENT

Hi Fadi,

Confirmation has been received from AECOM on required analysis as per the below email chain. Please go ahead with the rebatch of these samples as per the following table.

Results are to be reported on Thursday 3/3/11.

	Lab Sample	Field ID	Sample Date	Volume Remaining (g)	Analysis
1	ES1102973-002	BH403 8.0-8.4		~200	ASLP and TCLP 8 metals and ultra trace PAH + Ultra trace phenols
2	ES1102973-003	BH403 12.0-12.4	9-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + Ultra trace phenols
3	ES1103042-008	BH405 7.0-7.3	10-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + Ultra trace phenols
4	ES1103042-012	BH405 14.0-14.4	11-Feb-11	~150	ASLP 8 metals and ultra trace PAH + Ultra trace phenols
5	ES1102875-003	BH406 7.0-7.4	8-Feb-11	~150	ASLP 8 metals and ultra trace PAH + Ultra trace phenols
6	ES1102875-015	BH406 16.0-16.5	9-Feb-11	~150-200	ASLP and TCLP 8 metals and ultra trace PAH + Ultra trace phenols
7	ES1103336-009	BH408 2.0-2.4	14-Feb-11	~150	ASLP 8 metals and ultra trace PAH + Ultra trace phenols
8	ES1103336-013	BH408 9.0-9.4	15-Feb-11	~150	ASLP 8 metals and ultra trace PAH + Ultra trace phenols
9	ES1103336-002	BH409 3.7-4.0	14-Feb-11	~250	ASLP and TCLP 8 metals and ultra trace PAH + Ultra trace phenols
10	ES1103336-006	BH409 7.0-7.3	15-Feb-11	~150	ASLP 8 metals and ultra trace PAH + Ultra trace phenols

QUALITY CONTROL REPORT

Work Order	: **ES1103960**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 10
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This 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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Luke Witham	Senior Inorganic Chemist	Inorganics

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 1686494)									
ES1103960-001	BH403_8.0-8.4	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0002	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	0.010	0.011	14.2	0% - 50%
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	0.009	0.010	10.4	0% - 50%
		EG020A-W: Lead	7439-92-1	0.001	mg/L	0.012	0.013	10.3	0% - 50%
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.161	0.182	12.2	0% - 20%
ES1103960-010	BH409_7.0-7.3	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.073	0.074	1.6	0% - 50%
EG035W: Water Leachable Mercury by FIMS (QC Lot: 1686669)									
ES1103960-001	BH403_8.0-8.4	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1686494)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.6	87	111
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.4	90	106
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	106	94	114
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	90	112
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	108	88	120
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	86	116
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.1	82	116
EG035W: Water Leachable Mercury by FIMS (QCLot: 1686669)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	91.8	82	118
EP132A: Phenolic Compounds (QCLot: 1686729)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	98.7	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	101	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	70.5	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	78.5	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	74.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	96.6	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	95.4	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	99.0	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	57.0	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	103	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	49.3	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	71.9	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	47.8	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	96.2	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	91.2	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	100	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	98.5	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	80.4	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	103	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	84.7	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	86.9	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	91.3	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	94.2	73.6	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729) - continued								
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	98.4	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	103	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	92.1	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	108	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	98.6	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	93.5	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	102	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	116	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	100	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	95.0	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	112	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	79.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	84.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	94.8	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	93.9	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	100	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1686494)							
ES1103960-002	BH403_12.0-12.4	EG020A-W: Arsenic	7440-38-2	1 mg/L	104	70	130
		EG020A-W: Cadmium	7440-43-9	0.250 mg/L	103	70	130
		EG020A-W: Chromium	7440-47-3	1 mg/L	101	70	130
		EG020A-W: Copper	7440-50-8	1 mg/L	98.0	70	130
		EG020A-W: Lead	7439-92-1	1 mg/L	103	70	130
		EG020A-W: Nickel	7440-02-0	1 mg/L	108	70	130
		EG020A-W: Zinc	7440-66-6	1 mg/L	106	70	130
EG035W: Water Leachable Mercury by FIMS (QCLot: 1686669)							
ES1103960-010	BH409_7.0-7.3	EG035W: Mercury	7439-97-6	0.0100 mg/L	113	70	130

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1103960**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 24-FEB-2011	Issue Date	: 24-FEB-2011 17:52
Client Requested Due Date	: 03-MAR-2011	Scheduled Reporting Date	: **03-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 4.0'C
No. of coolers/boxes	: REBATCH	No. of samples received	: 10
Security Seal	: Not intact.	No. of samples analysed	: 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **This is a rebatch of ES1102973, ES1103042, ES1102875, ES1103336.**
- **THIS BATCH SPLIT INTO ES1103957 (TCLP).**
- **Holding times on Leach for for Semi-volatile analysis is 14 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EG020A-W Water Leachable Metals by ICP-MS - Suite A	SOIL - EG035W Water Leachable Mercury by FIMS	SOIL - EP132AB Ultra Trace PAH/Phenolic Compounds
ES1103960-001	24-FEB-2011 15:00	BH403_8.0-8.4	✓	✓	✓
ES1103960-002	24-FEB-2011 15:00	BH403_12.0-12.4	✓	✓	✓
ES1103960-003	24-FEB-2011 15:00	BH405_7.0-7.3	✓	✓	✓
ES1103960-004	24-FEB-2011 15:00	BH405_14.0-14.4	✓	✓	✓
ES1103960-005	24-FEB-2011 15:00	BH406_7.0-7.4	✓	✓	✓
ES1103960-006	24-FEB-2011 15:00	BH406_16.0-16.5	✓	✓	✓
ES1103960-007	24-FEB-2011 15:00	BH408_2.0-2.4	✓	✓	✓
ES1103960-008	24-FEB-2011 15:00	BH408_9.0-9.4	✓	✓	✓
ES1103960-009	24-FEB-2011 15:00	BH409_3.7-4.0	✓	✓	✓
ES1103960-010	24-FEB-2011 15:00	BH409_7.0-7.3	✓	✓	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MR GARRY SMITH

- *AU Certificate of Analysis - NATA (COA)	Email	garry.smith@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	garry.smith@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	garry.smith@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	garry.smith@aecom.com
- Chain of Custody (CoC) (COC)	Email	garry.smith@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	garry.smith@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	garry.smith@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	garry.smith@aecom.com
- EDI Format - XTab (XTAB)	Email	garry.smith@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1103960**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Order number	: 39540AUS	No. of samples received	: 10
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); 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
EG020W: Water Leachable Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH405_14.0-14.4, BH406_7.0-7.4, BH406_16.0-16.5, BH408_2.0-2.4, BH408_9.0-9.4, BH409_3.7-4.0, BH409_7.0-7.3	**27-FEB-2011**	**28-FEB-2011**	26-AUG-2011	✓	**28-FEB-2011**	26-AUG-2011	✓
EG035W: Water Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered BH403_8.0-8.4, BH403_12.0-12.4, BH405_7.0-7.3, BH405_14.0-14.4, BH406_7.0-7.4, BH406_16.0-16.5, BH408_2.0-2.4, BH408_9.0-9.4, BH409_3.7-4.0, BH409_7.0-7.3	**27-FEB-2011**	**----**	----	----	**28-FEB-2011**	27-MAR-2011	✓
EN60: Bottle Leaching Procedure							
LabSplit: Leach for organics and other tests BH406_7.0-7.4	**08-FEB-2011**	**---**	22-FEB-2011	----	**27-FEB-2011**	22-FEB-2011	×
LabSplit: Leach for organics and other tests BH403_8.0-8.4, BH403_12.0-12.4, BH406_16.0-16.5	**09-FEB-2011**	**---**	23-FEB-2011	----	**27-FEB-2011**	23-FEB-2011	×
LabSplit: Leach for organics and other tests BH405_7.0-7.3	**10-FEB-2011**	**---**	24-FEB-2011	----	**27-FEB-2011**	24-FEB-2011	×
LabSplit: Leach for organics and other tests BH405_14.0-14.4	**11-FEB-2011**	**---**	25-FEB-2011	----	**27-FEB-2011**	25-FEB-2011	×
LabSplit: Leach for organics and other tests BH408_2.0-2.4, BH409_3.7-4.0	**14-FEB-2011**	**---**	28-FEB-2011	----	**27-FEB-2011**	28-FEB-2011	✓
LabSplit: Leach for organics and other tests BH408_9.0-9.4, BH409_7.0-7.3	**15-FEB-2011**	**---**	01-MAR-2011	----	**27-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
EP132A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved								
BH403_8.0-8.4,	BH403_12.0-12.4,	**27-FEB-2011**	**26-FEB-2011**	06-MAR-2011	✓	**01-MAR-2011**	09-APR-2011	✓
BH405_7.0-7.3,	BH405_14.0-14.4,							
BH406_7.0-7.4,	BH406_16.0-16.5,							
BH408_2.0-2.4,	BH408_9.0-9.4,							
BH409_3.7-4.0,	BH409_7.0-7.3							
EP132B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
BH403_8.0-8.4,	BH403_12.0-12.4,	**27-FEB-2011**	**26-FEB-2011**	06-MAR-2011	✓	**01-MAR-2011**	09-APR-2011	✓
BH405_7.0-7.3,	BH405_14.0-14.4,							
BH406_7.0-7.4,	BH406_16.0-16.5,							
BH408_2.0-2.4,	BH408_9.0-9.4,							
BH409_3.7-4.0,	BH409_7.0-7.3							

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Water Leachable Mercury by FIMS	EG035W	1	10	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	12	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Water Leachable Mercury by FIMS	EG035W	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Water Leachable Mercury by FIMS	EG035W	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. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. 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)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in DI Water Leachate	EN25W	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Deionised Water Leach	EN60-Dla	SOIL	AS4439.3 Preparation of Leachates
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	SOIL	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

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

- **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

Sub-Matrix: **DI WATER LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132S: Acid Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-002	BH403_12.0-12.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-002	BH403_12.0-12.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-009	BH409_3.7-4.0	**2-Chlorophenol-D4**	93951-73-6	137 %	23-134 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1103960-002	BH403_12.0-12.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **DI WATER LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132S: Acid Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-009	BH409_3.7-4.0	**2-Fluorobiphenyl**	321-60-8	131 %	43-116 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-005	BH406_7.0-7.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-004	BH405_14.0-14.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-006	BH406_16.0-16.5	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1103960-008	BH408_9.0-9.4	**4-Terphenyl-d14**	1718-51-0	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.

Matrix: **SOIL**

Method	*Extraction / Preparation*	*Analysis*

Matrix: **SOIL**

Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EN60: Bottle Leaching Procedure						
LabSplit: Leach for organics and other tests BH406_7.0-7.4	----	----	----	27-FEB-2011	22-FEB-2011	**5**
LabSplit: Leach for organics and other tests BH403_8.0-8.4, BH403_12.0-12.4, BH406_16.0-16.5	----	----	----	27-FEB-2011	23-FEB-2011	**4**
LabSplit: Leach for organics and other tests BH405_7.0-7.3	----	----	----	27-FEB-2011	24-FEB-2011	**3**
LabSplit: Leach for organics and other tests BH405_14.0-14.4	----	----	----	27-FEB-2011	25-FEB-2011	**2**

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- **No Quality Control Sample Frequency Outliers exist.**

QUALITY CONTROL REPORT

Work Order	: **ES1103960**	Page	: 1 of 6
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1 REBATCH OF ES1102973 ES1103042 ES1102875 & ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 03-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 10
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This 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*
Edwandy Fadjar	Senior Organic Chemist	Organics
Luke Witham	Senior Inorganic Chemist	Inorganics

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 1686494)									
ES1103960-001	BH403_8.0-8.4	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0002	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	0.010	0.011	14.2	0% - 50%
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	0.009	0.010	10.4	0% - 50%
		EG020A-W: Lead	7439-92-1	0.001	mg/L	0.012	0.013	10.3	0% - 50%
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.161	0.182	12.2	0% - 20%
ES1103960-010	BH409_7.0-7.3	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.073	0.074	1.6	0% - 50%
EG035W: Water Leachable Mercury by FIMS (QC Lot: 1686669)									
ES1103960-001	BH403_8.0-8.4	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1686494)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.6	87	111
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.4	90	106
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	106	94	114
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	90	112
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	108	88	120
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	86	116
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.1	82	116
EG035W: Water Leachable Mercury by FIMS (QCLot: 1686669)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	91.8	82	118
EP132A: Phenolic Compounds (QCLot: 1686729)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	98.7	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	101	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	70.5	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	78.5	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	74.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	96.6	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	95.4	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	99.0	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	57.0	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	103	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	49.3	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	71.9	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	47.8	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	96.2	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	91.2	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	100	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	98.5	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	80.4	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	103	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	84.7	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	86.9	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	91.3	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	94.2	73.6	114

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1686729) - continued								
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	98.4	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	103	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	92.1	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	108	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	98.6	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	93.5	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	102	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	116	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	100	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	95.0	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	112	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	79.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	84.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	94.8	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	93.9	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	100	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1686494)							
ES1103960-002	BH403_12.0-12.4	EG020A-W: Arsenic	7440-38-2	1 mg/L	104	70	130
		EG020A-W: Cadmium	7440-43-9	0.250 mg/L	103	70	130
		EG020A-W: Chromium	7440-47-3	1 mg/L	101	70	130
		EG020A-W: Copper	7440-50-8	1 mg/L	98.0	70	130
		EG020A-W: Lead	7439-92-1	1 mg/L	103	70	130
		EG020A-W: Nickel	7440-02-0	1 mg/L	108	70	130
		EG020A-W: Zinc	7440-66-6	1 mg/L	106	70	130
EG035W: Water Leachable Mercury by FIMS (QCLot: 1686669)							
ES1103960-010	BH409_7.0-7.3	EG035W: Mercury	7439-97-6	0.0100 mg/L	113	70	130

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1104964**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI REBATCH OF ES1103100 ES1103042 ES1102973 ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 34432		
C-O-C number	: ----	Date Samples Received	: 09-MAR-2011
Sampler	: LK/KO	Issue Date	: 18-MAR-2011
Site	: ----		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
		Sydney Inorganics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Luke Witham	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EK026G: LOR raised for Total Cyanide on sample Id (BH403_15-15.4 and BH409_6.0-6.4) due to sample matrix.**
- **EP074&75: Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP074&EP080: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.**
- **EP074:Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP075: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Poor surrogate and matrix spike recovery due to sample matrix interferences.**
- **EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs**

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	BH400_15-15.4	BH402_15-15.5	BH402_16-16.3	BH403_10-10.4	BH403_15-15.4
Client sample ID				BH400_15-15.4	BH402_15-15.5	BH402_16-16.3	BH403_10-10.4	BH403_15-15.4
Client sampling date / time				12-MAR-2011 12:00	12-MAR-2011 12:00	12-MAR-2011 12:00	12-MAR-2011 12:00	12-MAR-2011 12:00
				ES1104964-001	ES1104964-004	ES1104964-005	ES1104964-006	ES1104964-007
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.50**	**0.12**	**0.15**	**0.78**	**0.14**
EP075B: Polynuclear Aromatic Hydrocarbons								
2-Methylnaphthalene	91-57-6	2	µg/L	**20**	**652**	**300**	**902**	**823**
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	**8**	**101**	**91**	**144**	**139**
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	**360**	**14600**	**7620**	**113000**	**73500**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**78.7**	**92.8**	**87.0**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**38.6**	**41.0**	**38.4**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**89.0**	**92.0**	**85.6**	**106**	**104**
2.4.6-Tribromophenol	118-79-6	0.1	%	**84.0**	**102**	**90.1**	**97.1**	**81.9**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**93.0**	**95.6**	**87.4**	**109**	**114**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**78.7**	**82.6**	**76.0**	**97.0**	**95.6**
2-Fluorobiphenyl	321-60-8	0.1	%	**87.7**	**84.1**	**119**	**142**	**118**
Anthracene-d10	1719-06-8	0.1	%	**92.7**	**95.1**	**86.6**	**110**	**115**
4-Terphenyl-d14	1718-51-0	0.1	%	**91.5**	**98.4**	**88.0**	**103**	**97.0**

Analytical Results

Sub-Matrix: DI WATER LEACHATE				Client sample ID	BH407_15.1-15.45	BH409_6.0-6.4	----	----	----
				Client sampling date / time	12-MAR-2011 12:00	12-MAR-2011 12:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1104964-008	ES1104964-009	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.20**	**0.28**	----	----	----
EP075B: Polynuclear Aromatic Hydrocarbons									
2-Methylnaphthalene	91-57-6	2	µg/L		<2	**20**	----	----	----
EP075H: Anilines and Benzidines									
Dibenzofuran	132-64-9	2	µg/L		<2	<2	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		**570**	**370**	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**77.3**	**86.2**	----	----	----
Phenol-d6	13127-88-3	0.1	%		**39.0**	**36.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**87.6**	**78.7**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**91.7**	**86.8**	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		**85.8**	**80.9**	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		**76.0**	**72.6**	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%		**89.1**	**81.8**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**92.5**	**85.7**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**98.0**	**89.6**	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH400_15-15.4	BH401_10-10.4	BH401_20-20.15	BH402_15-15.5	BH402_16-16.3
				Client sampling date / time: 14-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00	09-FEB-2011 15:00	10-FEB-2011 15:00
				ES1104964-001	ES1104964-002	ES1104964-003	ES1104964-004	ES1104964-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	15.7	26.4	15.3	15.5	15.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1	mg/kg	<1	<1	<1	<1	<1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	<20	<20	<20
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	6.1	----	----	8.6	8.6
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Final pH	----	0.1	pH Unit	25.0	25.0	25.0	25.0	25.0
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	3.7	0.8
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	8.0	6.4
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	2.0	1.0
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	19.0	10.0
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.8
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	10.0	4.9
EP075B: Polynuclear Aromatic Hydrocarbons								
2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	<0.5	<0.5	54.4	4.5
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	<0.5	23.1	2.3
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	67	35
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	740	150
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	102	119	99.4	120	118
Toluene-D8	2037-26-5	0.1	%	109	124	107	122	117
4-Bromofluorobenzene	460-00-4	0.1	%	103	117	101	120	118
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	106	94.1	101	Not Determined	49.8
Phenol-d6	13127-88-3	0.1	%	92.6	99.5	81.2	111	94.7
2-Chlorophenol-D4	93951-73-6	0.1	%	95.1	93.6	80.8	73.9	93.4
2.4.6-Tribromophenol	118-79-6	0.1	%	94.6	73.9	57.7	51.7	84.1
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	94.3	94.9	85.6	98.2	92.9
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	79.5	77.8	73.5	86.1	78.2
2-Fluorobiphenyl	321-60-8	0.1	%	94.1	92.0	83.4	95.6	87.0

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH400_15-15.4	BH401_10-10.4	BH401_20-20.15	BH402_15-15.5	BH402_16-16.3
				Client sampling date / time: 14-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00	09-FEB-2011 15:00	10-FEB-2011 15:00
				ES1104964-001	ES1104964-002	ES1104964-003	ES1104964-004	ES1104964-005
EP075T: Base/Neutral Extractable Surrogates - Continued								
Anthracene-d10	1719-06-8	0.1	%	**93.7**	**98.9**	**84.8**	**110**	**94.5**
4-Terphenyl-d14	1718-51-0	0.1	%	**96.0**	**93.4**	**80.6**	**92.7**	**93.2**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**102**	**117**	**99.2**	**119**	**115**
Toluene-D8	2037-26-5	0.1	%	**108**	**122**	**106**	**120**	**113**
4-Bromofluorobenzene	460-00-4	0.1	%	**103**	**118**	**99.6**	**120**	**106**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH403_10-10.4	BH403_15-15.4	BH407_15.1-15.45	BH409_6.0-6.4	----
				Client sampling date / time	09-FEB-2011 15:00	09-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	----
					ES1104964-006	ES1104964-007	ES1104964-008	ES1104964-009	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		14.3	16.0	15.6	20.8	----
EK026G: Total Cyanide By Discrete Analyser									
Total Cyanide	57-12-5	1	mg/kg		<1	<1	<1	<1	----
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg		<20	<20	<20	<20	----
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		8.3	7.5	6.1	7.4	----
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)									
Final pH	----	0.1	pH Unit		25.0	25.0	25.0	25.0	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	0.2	mg/kg		83.7	7.0	<0.2	0.3	----
Toluene	108-88-3	0.5	mg/kg		202	29.8	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg		20.6	2.4	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		318	38.4	<0.5	<0.5	----
Styrene	100-42-5	0.5	mg/kg		112	17.0	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		93.3	11.6	<0.5	<0.5	----
EP075B: Polynuclear Aromatic Hydrocarbons									
2-Methylnaphthalene	91-57-6	0.5	mg/kg		528	324	<0.5	<0.5	----
EP075H: Anilines and Benzidines									
Dibenzofuran	132-64-9	0.5	mg/kg		222	130	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		930	95	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg		12300	9340	<50	<50	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		91.4	120	80.0	81.6	----
Toluene-D8	2037-26-5	0.1	%		122	90.1	94.9	100	----
4-Bromofluorobenzene	460-00-4	0.1	%		134	108	102	106	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		105	64.4	104	100	----
Phenol-d6	13127-88-3	0.1	%		76.9	78.4	96.5	84.7	----
2-Chlorophenol-D4	93951-73-6	0.1	%		60.9	70.3	100	79.2	----
2.4.6-Tribromophenol	118-79-6	0.1	%		52.5	69.2	67.4	61.1	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		91.0	105	97.7	85.0	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		79.2	89.7	85.8	73.2	----
2-Fluorobiphenyl	321-60-8	0.1	%		121	120	98.9	85.6	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH403_10-10.4	BH403_15-15.4	BH407_15.1-15.45	BH409_6.0-6.4	----
				Client sampling date / time	09-FEB-2011 15:00	09-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	----
					ES1104964-006	ES1104964-007	ES1104964-008	ES1104964-009	----
EP075T: Base/Neutral Extractable Surrogates - Continued									
Anthracene-d10	1719-06-8	0.1	%		**117**	**114**	**103**	**90.3**	----
4-Terphenyl-d14	1718-51-0	0.1	%		**106**	**105**	**98.0**	**84.3**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**85.5**	**120**	**91.5**	**92.6**	----
Toluene-D8	2037-26-5	0.1	%		**108**	**89.2**	**88.7**	**99.0**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**114**	**106**	**118**	**105**	----

Analytical Results

Sub-Matrix: **ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH400_15-15.4	BH401_10-10.4	BH401_20-20.15	BH402_15-15.5	BH402_16-16.3
				Client sampling date / time: 14-MAR-2011 12:00	14-MAR-2011 12:00	15-MAR-2011 12:00	15-MAR-2011 12:00	15-MAR-2011 12:00
				ES1104964-001	ES1104964-002	ES1104964-003	ES1104964-004	ES1104964-005
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	1	µg/L	<1	<1	<1	**43**	**2**
Toluene	108-88-3	2	µg/L	<5	<5	<5	**156**	**19**
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	**18**	**2**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	**226**	**32**
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	**92**	**14**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	**620**	**70**
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**102**	**104**	**85.3**	**94.8**	**85.7**
Toluene-D8	2037-26-5	0.1	%	**108**	**108**	**87.4**	**105**	**89.5**
4-Bromofluorobenzene	460-00-4	0.1	%	**91.7**	**98.6**	**84.8**	**95.4**	**82.5**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**98.6**	**99.7**	**101**	**119**	**108**
Toluene-D8	2037-26-5	0.1	%	**97.7**	**97.2**	**95.6**	**115**	**98.0**
4-Bromofluorobenzene	460-00-4	0.1	%	**86.1**	**90.8**	**93.1**	**106**	**91.3**

Analytical Results

Sub-Matrix: **ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID	BH403_10-10.4	BH403_15-15.4	BH407_15.1-15.45	BH409_6.0-6.4	----
				Client sampling date / time	15-MAR-2011 12:00	16-MAR-2011 12:00	16-MAR-2011 12:00	16-MAR-2011 12:00	----
					ES1104964-006	ES1104964-007	ES1104964-008	ES1104964-009	----
EK026G: Total Cyanide By Discrete Analyser									
Total Cyanide	57-12-5	0.004	mg/L		<0.004	<0.040	<0.004	<0.040	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Benzene	71-43-2	1	µg/L		**3500**	**641**	<1	**2**	----
Toluene	108-88-3	2	µg/L		**4220**	**2180**	<5	<5	----
Ethylbenzene	100-41-4	2	µg/L		**166**	**165**	<2	**6**	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		**1920**	**1900**	**2**	**6**	----
Styrene	100-42-5	5	µg/L		**1110**	**1140**	<5	<5	----
ortho-Xylene	95-47-6	2	µg/L		**779**	**805**	<2	**6**	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		**13900**	**8620**	<20	<20	----
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**102**	**92.0**	**85.0**	**101**	----
Toluene-D8	2037-26-5	0.1	%		**109**	**106**	**100**	**111**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**103**	**103**	**93.5**	**107**	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**120**	**116**	**107**	**120**	----
Toluene-D8	2037-26-5	0.1	%		**120**	**117**	**110**	**116**	----
4-Bromofluorobenzene	460-00-4	0.1	%		**116**	**113**	**101**	**119**	----

Surrogate Control Limits

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	116.6
Phenol-d6	13127-88-3	10.0	69.0
2-Chlorophenol-D4	93951-73-6	20.9	129.7
2.4.6-Tribromophenol	118-79-6	10.0	150.7
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29.4	141.7
1.2-Dichlorobenzene-D4	2199-69-1	23.6	120.7
2-Fluorobiphenyl	321-60-8	27.2	134.9
Anthracene-d10	1719-06-8	29.7	140.7
4-Terphenyl-d14	1718-51-0	27.6	143.6

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	70.1	130.9
Toluene-D8	2037-26-5	66.3	137.7
4-Bromofluorobenzene	460-00-4	60.3	136.3
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	147.0
Phenol-d6	13127-88-3	12.5	110.6
2-Chlorophenol-D4	93951-73-6	10.0	116.8
2.4.6-Tribromophenol	118-79-6	10.0	120.1
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	13.3	124.5
1.2-Dichlorobenzene-D4	2199-69-1	11.9	103.9
2-Fluorobiphenyl	321-60-8	11.3	126.1
Anthracene-d10	1719-06-8	13.1	128.1
4-Terphenyl-d14	1718-51-0	10.0	134.7
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **ZHE LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7

Sub-Matrix: **ZHE LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1104964**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE PIGRAM	Contact	: Jennifer Cullen
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E-mail	: kate.pigram@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI REBATCH OF ES1103100 ES1103042 ES1102973 ES1103336	Page	: 1 of 3
Order number	: 34432		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 09-MAR-2011	Issue Date	: 10-MAR-2011 14:15
Client Requested Due Date	: 16-MAR-2011	Scheduled Reporting Date	: **16-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 24'C
No. of coolers/boxes	: REBATCH	No. of samples received	: 9
Security Seal	: Not intact.	No. of samples analysed	: 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **Volatile organic compound analysis may be compromised as sample containers contained headspace. Please contact ALS for further information.**
- **This is a rebatch of ES1103100, ES1103042, ES1102973 & ES1103336.**
- **Holding times on soil for ZHE leach for VOC & CN analysis is 7 days from sampling.**
- **Holding times on soil for leach for organics analysis is 14 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EA055-103 Moisture Content	SOIL - EK026G (Solids) Total Cyanide By Discrete Analyser	SOIL - EK026G Total Cyanide by Discrete Analyser	SOIL - EK055 (solids) Ammonia as N	SOIL - EK055G Ammonia as N By Discrete Analyser	SOIL - EP071(V - TPH-WD) TPH Volatiles	SOIL - EP074 (water) Volatile Organic Compounds	SOIL - S-23 SVOC/VOC
ES1104964-001	09-MAR-2011 15:00	BH400_15-15.4			✓		✓			
	14-FEB-2011 15:00	BH400_15-15.4		✓		✓				✓
ES1104964-002	09-MAR-2011 15:00	BH401_10-10.4			✓			✓	✓	
	10-FEB-2011 15:00	BH401_10-10.4	✓	✓		✓				✓
ES1104964-003	09-MAR-2011 15:00	BH401_20-20.15			✓			✓	✓	
	11-FEB-2011 15:00	BH401_20-20.15	✓	✓		✓				✓
ES1104964-004	09-FEB-2011 15:00	BH402_15-15.5		✓		✓				✓
	09-MAR-2011 15:00	BH402_15-15.5			✓		✓			
ES1104964-005	09-MAR-2011 15:00	BH402_16-16.3			✓		✓			
	10-FEB-2011 15:00	BH402_16-16.3		✓		✓				✓
ES1104964-006	09-FEB-2011 15:00	BH403_10-10.4		✓		✓				✓
	09-MAR-2011 15:00	BH403_10-10.4			✓		✓			
ES1104964-007	09-FEB-2011 15:00	BH403_15-15.4		✓		✓				✓
	09-MAR-2011 15:00	BH403_15-15.4			✓		✓			
ES1104964-008	09-MAR-2011 15:00	BH407_15.1-15.45			✓		✓			
	14-FEB-2011 15:00	BH407_15.1-15.45		✓		✓				✓
ES1104964-009	09-MAR-2011 15:00	BH409_6.0-6.4			✓		✓			
	15-FEB-2011 15:00	BH409_6.0-6.4		✓		✓				✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - TPH only TPH (C6 - C36)	SOIL - TPH TPH (fractions)	SOIL - W-23 SVOC/VOC
ES1104964-001	09-MAR-2011 15:00	BH400_15-15.4		✓	✓
	14-FEB-2011 15:00	BH400_15-15.4	✓		
ES1104964-002	10-FEB-2011 15:00	BH401_10-10.4	✓		
ES1104964-003	11-FEB-2011 15:00	BH401_20-20.15	✓		
ES1104964-004	09-FEB-2011 15:00	BH402_15-15.5	✓		
	09-MAR-2011 15:00	BH402_15-15.5		✓	✓

			SOIL - TPH only TPH (C6 - C36)	SOIL - TPH TPH (fractions)	SOIL - W-23 SVOC/VOC
ES1104964-005	09-MAR-2011 15:00	BH402_16-16.3		✓	✓
	10-FEB-2011 15:00	BH402_16-16.3	✓		
ES1104964-006	09-FEB-2011 15:00	BH403_10-10.4	✓		
	09-MAR-2011 15:00	BH403_10-10.4		✓	✓
ES1104964-007	09-FEB-2011 15:00	BH403_15-15.4	✓		
	09-MAR-2011 15:00	BH403_15-15.4		✓	✓
ES1104964-008	09-MAR-2011 15:00	BH407_15.1-15.45		✓	✓
	14-FEB-2011 15:00	BH407_15.1-15.45	✓		
ES1104964-009	09-MAR-2011 15:00	BH409_6.0-6.4		✓	✓
	15-FEB-2011 15:00	BH409_6.0-6.4	✓		

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

16.3-11

Fadi Soro

From: Jennifer Cullen
Sent: Tuesday, 8 March 2011 5:13 PM
To: Samples Sydney; Fadi Soro
Subject: FW: Additional Analysis Request - Barangaroo

Hi Fadi,

Could you please arrange for the following samples to be rebatched for the following analysis **plus ASLP** for the same tests?

Benzene 125 ug/L
Toluene 45 ug/L
Ethylbenzene 20 ug/L
Xylene 18 ug/L
TPH C6-C9 3.6 ug/L
TPH C10-C14 0.03 ug/L
Dibenzofuran 0.7 ug/L
2-methylnaphthalene 0.4 ug/L
styrene 70 ug/L

plus cyanide + Ammonia as per Gary Smith 9/3/11.

352-353

BH400_15-15.4 14/2/11 ES1103100_26
BH401_10-10.4 10/2/11 ES1103042_21 } 5350-351
BH401_20-20.15 11/2/11 ES1103042_28
BH402_15-15.5 9/2/11 ES1102973_34
BH402_16-16.3 10/2/11 ES1102973_35 } 5342, 344-345
BH403_10-10.4 9/2/11 ES1102973_21
BH403_15-15.4 9/2/11 ES1102973_25
BH407_15.1-15.45 14/2/11 ES1103100_8 — 352-353
BH409_6.0-6.4 15/2/11 ES1103336_5 8378

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen
SENIOR PROJECT MANAGER

ALS | Environmental Division

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Please consider the environment before printing this email.

From: Davis, Anthony [mailto:Anthony.Davis@aecom.com]
Sent: Tuesday, 8 March 2011 4:50 PM

Hi Gary,

From the list of samples that Anthony has provided we have located the sample containers in storage and have the following remaining volumes:

Sample ID	Original Work Order	~ Volume	Parameters ALS to Analyse Total plus ASLP. DI.
BH400_15-15.4	ES1103100_26	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH401_ 10-10.4	ES1103042_21	~ 100g (150ml jar * no completely filled)	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 styrene ~~Ammonia~~. Cyanide
BH401_20-20.15	ES1103042_28	~ 100 g (150ml jar* no completely filled)	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 styrene ~~Ammonia~~ Cyanide
BH402_15-15.5	ES1102973_34	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH402_16-16.3	ES1102973_35	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH403_ 10-10.4	ES1102973_21	~ 250g	Benzene Toluene

			Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH403_ 15-15.4	ES1102973_25	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH407_15.1-15.45	ES1103100_8	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide
BH409_6.0-6.4	ES1103336_5	~ 250g	Benzene Toluene Ethylbenzene Xylene TPH C6-C9 TPH C10-C14 Dibenzofuran 2-methylnaphthalene styrene Ammonia Cyanide

From your list of required analytes we will need to prepare a semivolatile leach (~100g per sample) a volatile leach (~ 50g per sample) plus the primary analysis on the soil.

We will not have enough sample to complete all of these procedures for the following samples. We may have enough to conduct the primary analysis and the volatile leach. This will mean that you will not get results for ALSP Dibenzofuran or 2-methylnaphthalene.

BH401_ 10-10.4	ES1103042_21	~ 100g (150ml jar no completely filled)
BH401_20-20.15	ES1103042_28	~ 100 g (150ml jar no completely filled)

Could you please confirm if you are happy to proceed in this way?

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen
SENIOR PROJECT MANAGER

ALS | Environmental Division

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277-289 Woodpark Road, Smithfield, NSW, 2164

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From: Smith, Garry (Sydney) [mailto:Garry.Smith@aecom.com]
Sent: Wednesday, 9 March 2011 10:30 AM
To: Jennifer Cullen
Cc: Davis, Anthony
Subject: RE: Additional Analysis Request - Barangaroo

Jenn,

As discussed by phone today can you pl consider whether it is feasible to include Ammonia in the leachability analysis and also cyanide in this batch.

Pl call my mobile if you need to discuss the issue of analyte suitability for the leaching analyses.

Dr Garry Smith
Technical Director
D +61 2 8484 8922 M +61 419 128 922
Garry.Smith@aecom.com

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Level 5, 828 Pacific Highway, Gordon, NSW 2072
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www.aecom.com

Please consider the environment before printing this email.

To: Jennifer Cullen; Smith, Garry (Sydney)
Cc: McGrath, Kate
Subject: RE: Additional Analysis Request - Barangaroo

Jenny,

Please find the requested work order ID's:

BH400_15-15.4	ES1103100_26
BH401_ 10-10.4	ES1103042_21
BH401_20-20.15	ES1103042_28
BH402_15-15.5	ES1102973_34
BH402_16-16.3	ES1102973_35
BH403_ 10-10.4	ES1102973_21
BH403_ 15-15.4	ES1102973_25
BH407_15.1-15.45	ES1103100_8
BH409_6.0-6.4	ES1103336_5

As well as the requested ASLP analysis, please also analyse all 9 primary samples for total concentrations based on the analyte list below.

Thanks

Anthony Davis
Principal Professional Scientist
D +61 2 8484 8952 M +61 417 269 414
Anthony.Davis@aecom.com

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Please consider the environment before printing this email.

From: Jennifer Cullen [mailto:Jennifer.Cullen@alsglobal.com]
Sent: Tuesday, 8 March 2011 10:26 AM
To: Smith, Garry (Sydney); Davis, Anthony
Cc: McGrath, Kate
Subject: RE: Additional Analysis Request - Barangaroo

Hi Gary and Anthony,

Could you please confirm the work order number that these samples were originally analysed under and also confirm the which primary samples you refer to below that you would now like analysed?

I will then be able to arrange for these samples to be rebatched ASAP for you.

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen
SENIOR PROJECT MANAGER

ALS | Environmental Division

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P *Please consider the environment before printing this email.*

From: Smith, Garry (Sydney) [mailto:Garry.Smith@aecom.com]
Sent: Monday, 7 March 2011 5:57 PM
To: Davis, Anthony; Jennifer Cullen
Cc: McGrath, Kate
Subject: Re: Additional Analysis Request - Barangaroo

Pl proceed with the analysis despite being outside recommended holding times. GS

Sent from my BlackBerry Wireless Handheld

From: Davis, Anthony
To: 'Jennifer Cullen' <Jennifer.Cullen@alsglobal.com>
Cc: Smith, Garry (Sydney); McGrath, Kate
Sent: Mon Mar 07 17:18:36 2011
Subject: RE: Additional Analysis Request - Barangaroo
Hi Jenny,

Further to this earlier request from Kate, could you please undertake ASLP analysis on the following samples already with the lab (if they are still in holding times):

BH400_15-15.4
BH401_10-10.4
BH401_20-20.15
BH402_15-15.5
BH402_16-16.3
BH403_10-10.4
BH403_15-15.4
BH407_15.1-15.45
BH409_6.0-6.4

The analyte list is detailed below:

Benzene 125 ug/L
Toluene 45 ug/L
Ethylbenzene 20 ug/L
Xylene 18 ug/L

TPH C6-C9 3.6 ug/L
TPH C10-C14 0.03 ug/L
Dibenzofuran 0.7 ug/L
2-methylnaphthalene 0.4 ug/L
styrene 70 ug/L

Please note that we require ultra trace detection limits on the reported results. Additionally, where analysis has not been requested for the primary samples in the above list could you please undertake for the above analytes. Please contact me if you have any questions and cc Kate Mcgrath and Garry Smith on any correspondence.

A quick turnaround would be appreciated.

Regards

Anthony Davis
Principal Professional Scientist
D +61 2 8484 8952 M +61 417 269 414
Anthony.Davis@aecom.com

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.-. -.. -
From: O'Brien, Kate
Sent: Wednesday, 23 February 2011 5:38 PM
To: Jennifer Cullen
Cc: Davis, Anthony; Jones, Michael A. (Sydney); Lee, Amanda; Hansen, Catherine
Subject: Additional Analysis Request - Barangaroo

Hi Jenny,

Could I please get the 10 samples in the table below analysed for the following:

ASLP EP075B (SIM) PAH including B(a)P
ASLP EG005C & EG035C - 8 Metals
TCLP - PAHs including B(a)P
TCLP - 8 Metals

Lab Sample	Field ID	Sample Date
ES1102973-020	BH403_8.0-8.4	9-Feb-11
ES1102973-003	BH403_12.0-12.4	9-Feb-11
ES1103042-008	BH405_7.0-7.3	10-Feb-11
ES1103042-012	BH405_14.0-14.4	11-Feb-11
ES1102875-003	BH406_7.0-7.4	8-Feb-11
ES1102875-015	BH406_16.0-16.5	9-Feb-11

ES1103336-009	BH408_2.0-2.4	14-Feb-11
ES1103336-013	BH408_9.0-9.4	15-Feb-11
ES1103336-002	BH409_3.7-4.0	14-Feb-11
ES1103336-006	BH409_7.0-7.3	15-Feb-11

Please advise if there is insufficient sample and we'll nominate alternative samples for analysis

Regards,

Kate O'Brien
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

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.-. -.. -

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****

QUALITY CONTROL REPORT

Work Order	: **ES1104964**	Page	: 1 of 8
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI REBATCH OF ES1103100 ES1103042 ES1102973 ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 09-MAR-2011
Sampler	: LK/KO	Issue Date	: 18-MAR-2011
Order number	: 34432		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Quality Control Report contains the following information:

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

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*
		Sydney Inorganics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Luke Witham	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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: 1702101)									
ES1104896-014	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	4.2	4.0	4.0	No Limit
ES1104964-008	BH407_15.1-15.45	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.6	15.3	2.2	0% - 50%
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1704067)									
ES1104798-001	Anonymous	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
ES1104964-002	BH401_10-10.4	EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EK055: Ammonia as N (QC Lot: 1704447)									
ES1104964-001	BH400_15-15.4	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
ES1104964-008	BH407_15.1-15.45	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1701913)									
ES1104964-001	BH400_15-15.4	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1702525)									
ES1104964-001	BH400_15-15.4	EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075H: Anilines and Benzidines (QC Lot: 1702525)									
ES1104964-001	BH400_15-15.4	EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1701912)									
ES1104964-001	BH400_15-15.4	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1104975-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1702524)									
ES1104964-001	BH400_15-15.4	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1705811)									
ES1104964-001	BH400_15-15.4	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EW1100824-002	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1707375)									
ES1104964-004	BH402_15-15.5	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1708469)									
ES1104964-003	BH401_20-20.15	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1709202)									
ES1104964-007	BH403_15-15.4	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.040	<0.040	0.0	No Limit
ES1105463-004	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1705031)									
ES1104964-001	BH400_15-15.4	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.50	0.51	3.0	0% - 20%
EW1100867-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.94	0.90	5.0	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1706394)									
ES1105032-001	Anonymous	EP074: Benzene	71-43-2	1	µg/L	150	157	4.3	0% - 20%
		EP074: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
ES1105032-005	Anonymous	EP074: Benzene	71-43-2	1	µg/L	147	155	5.3	0% - 20%
		EP074: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1709066)									
ES1104964-003	BH401_20-20.15	EP074: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP074: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP074: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP074: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1706395)									
ES1105032-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	180	180	0.0	No Limit
ES1105032-005	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	170	180	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1709067)									
ES1104964-003	BH401_20-20.15	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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

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

Sub-Matrix: **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
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1704067)								
EK026G: Total Cyanide	57-12-5	1	mg/kg	<1	20.0 mg/kg	104	70	130
EK055: Ammonia as N (QCLot: 1704447)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	100 mg/kg	99.5	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1701913)								
EP074: Benzene	71-43-2	0.5	mg/kg	<0.5	1 mg/kg	89.9	64	126
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	81.5	63	135
EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	94.1	64	124
EP074: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.2	66	126
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	88.7	67	121
EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	94.9	66	124
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1702525)								
EP075: 2-Methylnaphthalene	91-57-6	0.5	mg/kg	<0.5	1.25 mg/kg	106	60.8	110
EP075H: Anilines and Benzidines (QCLot: 1702525)								
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.25 mg/kg	102	60.2	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1701912)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1702524)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	109	75.2	116

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1705811)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	105	70	112
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1707375)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	106	70	112
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1708469)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	106	70	112
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1709202)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	99.8	70	112
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1705031)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	108	79.6	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1706394)								
EP074: Benzene	71-43-2	1	µg/L	<1	10 µg/L	88.7	75	123
EP074: Toluene	108-88-3	2	µg/L	<5	10 µg/L	97.3	69	129
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	84.1	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	20 µg/L	86.9	76	120
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	80.2	75	119
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	89.0	78	120
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1709066)								
EP074: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.4	75	123
EP074: Toluene	108-88-3	2	µg/L	<2	10 µg/L	96.8	69	129
EP074: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	108	76	118
EP074: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	20 µg/L	108	76	120
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	100	75	119
EP074: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	108	78	120
EP075B: Polynuclear Aromatic Hydrocarbons (QCLot: 1704886)								
EP075: 2-Methylnaphthalene	91-57-6	2	µg/L	<2	5 µg/L	92.9	59	108
EP075H: Anilines and Benzidines (QCLot: 1704886)								
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	5 µg/L	92.1	65.3	108
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1704887)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	120	58.9	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1706395)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	90.8	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1709067)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	83.5	75	127

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
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1704067)							
ES1104798-001	Anonymous	EK026G: Total Cyanide	57-12-5	20.0 mg/kg	102	70	130
EK055: Ammonia as N (QCLot: 1704447)							
ES1104964-002	BH401_10-10.4	EK055: Ammonia as N	7664-41-7	20 mg/kg	# Not Determined	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1701913)							
ES1104964-001	BH400_15-15.4	EP074: Benzene	71-43-2	2.5 mg/kg	73.6	70	130
		EP074: Toluene	108-88-3	2.5 mg/kg	72.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1701912)							
ES1104964-001	BH400_15-15.4	EP080: C6 - C9 Fraction	----	32.5 mg/kg	84.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1702524)							
ES1104964-001	BH400_15-15.4	EP071: C10 - C14 Fraction	----	640 mg/kg	108	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
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1705811)							
ES1104964-001	BH400_15-15.4	EK026G: Total Cyanide	57-12-5	0.2 mg/L	103	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1707375)							
ES1104964-004	BH402_15-15.5	EK026G: Total Cyanide	57-12-5	0.2 mg/L	100	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1708469)							
ES1104964-003	BH401_20-20.15	EK026G: Total Cyanide	57-12-5	0.2 mg/L	105	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1709202)							
ES1104964-007	BH403_15-15.4	EK026G: Total Cyanide	57-12-5	2.0 mg/L	105	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1705031)							
ES1104964-001	BH400_15-15.4	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	75.8	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1706394)							
ES1105032-001	Anonymous	EP074: Benzene	71-43-2	25 µg/L	# Not Determined	70	130
		EP074: Toluene	108-88-3	25 µg/L	109	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1709066)							
ES1104964-003	BH401_20-20.15	EP074: Benzene	71-43-2	25 µg/L	96.8	70	130
		EP074: Toluene	108-88-3	25 µg/L	94.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1706395)							
ES1105032-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	97.6	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*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1709067)							
ES1104964-003	BH401_20-20.15	EP080: C6 - C9 Fraction	----	325 µg/L	94.8	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1104964**	Page	: 1 of 15
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI REBATCH OF ES1103100 ES1103042 ES1102973 ES1103336	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 09-MAR-2011
Sampler	: LK/KO	Issue Date	: 18-MAR-2011
Order number	: 34432		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **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 BH402_15-15.5, BH403_10-10.4, BH403_15-15.4	**09-FEB-2011**	**----**	----	----	**10-MAR-2011**	23-FEB-2011	✘
Soil Glass Jar - Unpreserved BH401_10-10.4, BH402_16-16.3	**10-FEB-2011**	**----**	----	----	**10-MAR-2011**	24-FEB-2011	✘
Soil Glass Jar - Unpreserved BH401_20-20.15	**11-FEB-2011**	**----**	----	----	**10-MAR-2011**	25-FEB-2011	✘
Soil Glass Jar - Unpreserved BH400_15-15.4, BH407_15.1-15.45	**14-FEB-2011**	**----**	----	----	**10-MAR-2011**	28-FEB-2011	✘
Soil Glass Jar - Unpreserved BH409_6.0-6.4	**15-FEB-2011**	**----**	----	----	**10-MAR-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
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**14-MAR-2011**	16-FEB-2011	×	**14-MAR-2011**	28-MAR-2011	✓
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**14-MAR-2011**	17-FEB-2011	×	**14-MAR-2011**	28-MAR-2011	✓
Soil Glass Jar - Unpreserved BH401_20-20.15		**11-FEB-2011**	**14-MAR-2011**	18-FEB-2011	×	**14-MAR-2011**	28-MAR-2011	✓
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**14-MAR-2011**	21-FEB-2011	×	**14-MAR-2011**	28-MAR-2011	✓
Soil Glass Jar - Unpreserved BH409_6.0-6.4		**15-FEB-2011**	**14-MAR-2011**	22-FEB-2011	×	**14-MAR-2011**	28-MAR-2011	✓
White Plastic Bottle-NaOH BH400_15-15.4,	BH401_10-10.4	**14-MAR-2011**	**14-MAR-2011**	28-MAR-2011	✓	**14-MAR-2011**	28-MAR-2011	✓
White Plastic Bottle-NaOH BH402_15-15.5, BH403_10-10.4	BH402_16-16.3,	**15-MAR-2011**	**15-MAR-2011**	29-MAR-2011	✓	**15-MAR-2011**	29-MAR-2011	✓
White Plastic Bottle-NaOH BH401_20-20.15		**15-MAR-2011**	**16-MAR-2011**	29-MAR-2011	✓	**16-MAR-2011**	29-MAR-2011	✓
White Plastic Bottle-NaOH BH403_15-15.4, BH409_6.0-6.4	BH407_15.1-15.45,	**16-MAR-2011**	**16-MAR-2011**	30-MAR-2011	✓	**16-MAR-2011**	30-MAR-2011	✓
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**----**	----	----	**11-MAR-2011**	08-AUG-2011	✓
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**----**	----	----	**11-MAR-2011**	09-AUG-2011	✓
Soil Glass Jar - Unpreserved BH401_20-20.15		**11-FEB-2011**	**----**	----	----	**11-MAR-2011**	10-AUG-2011	✓
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**----**	----	----	**11-MAR-2011**	13-AUG-2011	✓
Soil Glass Jar - Unpreserved BH409_6.0-6.4		**15-FEB-2011**	**----**	----	----	**11-MAR-2011**	14-AUG-2011	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulphuric Acid BH400_15-15.4, BH402_16-16.3, BH403_15-15.4, BH409_6.0-6.4	BH402_15-15.5, BH403_10-10.4, BH407_15.1-15.45,	**12-MAR-2011**	**---**	09-APR-2011	----	**14-MAR-2011**	09-APR-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
EN60: Bottle Leaching Procedure							
LabSplit: Leach for organics and other tests BH402_15-15.5, BH403_10-10.4, BH403_15-15.4	**09-FEB-2011**	---	23-FEB-2011	----	**12-MAR-2011**	23-FEB-2011	×
LabSplit: Leach for organics and other tests BH402_16-16.3	**10-FEB-2011**	---	24-FEB-2011	----	**12-MAR-2011**	24-FEB-2011	×
LabSplit: Leach for organics and other tests BH400_15-15.4, BH407_15.1-15.45	**14-FEB-2011**	---	28-FEB-2011	----	**12-MAR-2011**	28-FEB-2011	×
LabSplit: Leach for organics and other tests BH409_6.0-6.4	**15-FEB-2011**	---	01-MAR-2011	----	**12-MAR-2011**	01-MAR-2011	×
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)							
Lab Split: ZHE leach for VOC & CN BH402_15-15.5, BH403_10-10.4	**09-FEB-2011**	---	16-FEB-2011	----	**15-MAR-2011**	16-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH403_15-15.4	**09-FEB-2011**	---	16-FEB-2011	----	**16-MAR-2011**	16-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH401_10-10.4	**10-FEB-2011**	---	17-FEB-2011	----	**14-MAR-2011**	17-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH402_16-16.3	**10-FEB-2011**	---	17-FEB-2011	----	**15-MAR-2011**	17-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH401_20-20.15	**11-FEB-2011**	---	18-FEB-2011	----	**15-MAR-2011**	18-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH400_15-15.4	**14-FEB-2011**	---	21-FEB-2011	----	**14-MAR-2011**	21-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH407_15.1-15.45	**14-FEB-2011**	---	21-FEB-2011	----	**16-MAR-2011**	21-FEB-2011	×
Lab Split: ZHE leach for VOC & CN BH409_6.0-6.4	**15-FEB-2011**	---	22-FEB-2011	----	**16-MAR-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
EP074A: Monocyclic Aromatic Hydrocarbons								
Amber VOC Vial - HCl								
BH400_15-15.4,	BH401_10-10.4	**14-MAR-2011**	**16-MAR-2011**	28-MAR-2011	✓	**16-MAR-2011**	28-MAR-2011	✓
Amber VOC Vial - HCl								
BH401_20-20.15, BH402_16-16.3,	BH402_15-15.5, BH403_10-10.4	**15-MAR-2011**	**16-MAR-2011**	29-MAR-2011	✓	**16-MAR-2011**	29-MAR-2011	✓
Amber VOC Vial - HCl								
BH403_15-15.4, BH409_6.0-6.4	BH407_15.1-15.45,	**16-MAR-2011**	**16-MAR-2011**	30-MAR-2011	✓	**16-MAR-2011**	30-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**10-MAR-2011**	23-FEB-2011	×	**15-MAR-2011**	23-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**10-MAR-2011**	24-FEB-2011	×	**15-MAR-2011**	24-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH401_20-20.15		**11-FEB-2011**	**10-MAR-2011**	25-FEB-2011	×	**15-MAR-2011**	25-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**10-MAR-2011**	28-FEB-2011	×	**15-MAR-2011**	28-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH409_6.0-6.4		**15-FEB-2011**	**10-MAR-2011**	01-MAR-2011	×	**15-MAR-2011**	01-MAR-2011	×
EP075B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
BH400_15-15.4, BH402_16-16.3, BH403_15-15.4, BH409_6.0-6.4	BH402_15-15.5, BH403_10-10.4, BH407_15.1-15.45,	**12-MAR-2011**	**14-MAR-2011**	19-MAR-2011	✓	**14-MAR-2011**	23-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**10-MAR-2011**	23-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**10-MAR-2011**	24-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_20-20.15		**11-FEB-2011**	**10-MAR-2011**	25-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**10-MAR-2011**	28-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH409_6.0-6.4		**15-FEB-2011**	**10-MAR-2011**	01-MAR-2011	×	**11-MAR-2011**	19-APR-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
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved BH400_15-15.4, BH402_15-15.5, BH402_16-16.3, BH403_10-10.4, BH403_15-15.4, BH407_15.1-15.45, BH409_6.0-6.4	**12-MAR-2011**	**14-MAR-2011**	19-MAR-2011	✓	**14-MAR-2011**	23-APR-2011	✓
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_10-10.4, BH403_15-15.4	**09-FEB-2011**	**10-MAR-2011**	23-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved BH401_10-10.4, BH402_16-16.3	**10-FEB-2011**	**10-MAR-2011**	24-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved BH401_20-20.15	**11-FEB-2011**	**10-MAR-2011**	25-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved BH400_15-15.4, BH407_15.1-15.45	**14-FEB-2011**	**10-MAR-2011**	28-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved BH409_6.0-6.4	**15-FEB-2011**	**10-MAR-2011**	01-MAR-2011	×	**11-MAR-2011**	19-APR-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								
Amber Glass Bottle - Unpreserved								
BH400_15-15.4, BH402_16-16.3, BH403_15-15.4, BH409_6.0-6.4	BH402_15-15.5, BH403_10-10.4, BH407_15.1-15.45,	**12-MAR-2011**	**14-MAR-2011**	19-MAR-2011	✓	**14-MAR-2011**	23-APR-2011	✓
Amber VOC Vial - HCl								
BH400_15-15.4,	BH401_10-10.4	**14-MAR-2011**	**16-MAR-2011**	28-MAR-2011	✓	**16-MAR-2011**	28-MAR-2011	✓
Amber VOC Vial - HCl								
BH401_20-20.15, BH402_16-16.3,	BH402_15-15.5, BH403_10-10.4	**15-MAR-2011**	**16-MAR-2011**	29-MAR-2011	✓	**16-MAR-2011**	29-MAR-2011	✓
Amber VOC Vial - HCl								
BH403_15-15.4, BH409_6.0-6.4	BH407_15.1-15.45,	**16-MAR-2011**	**16-MAR-2011**	30-MAR-2011	✓	**16-MAR-2011**	30-MAR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**10-MAR-2011**	23-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	**09-FEB-2011**	**10-MAR-2011**	23-FEB-2011	×	**15-MAR-2011**	23-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**10-MAR-2011**	24-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_10-10.4,	BH402_16-16.3	**10-FEB-2011**	**10-MAR-2011**	24-FEB-2011	×	**15-MAR-2011**	24-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH401_20-20.15		**11-FEB-2011**	**10-MAR-2011**	25-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH401_20-20.15		**11-FEB-2011**	**10-MAR-2011**	25-FEB-2011	×	**15-MAR-2011**	25-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**10-MAR-2011**	28-FEB-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH400_15-15.4,	BH407_15.1-15.45	**14-FEB-2011**	**10-MAR-2011**	28-FEB-2011	×	**15-MAR-2011**	28-FEB-2011	×
Soil Glass Jar - Unpreserved								
BH409_6.0-6.4		**15-FEB-2011**	**10-MAR-2011**	01-MAR-2011	×	**11-MAR-2011**	19-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH409_6.0-6.4		**15-FEB-2011**	**10-MAR-2011**	01-MAR-2011	×	**15-MAR-2011**	01-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	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**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
Volatile Organic Compounds	EP074	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**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
Volatile Organic Compounds	EP074	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**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
Volatile Organic Compounds	EP074	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	9	**11.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	9	**11.1**	**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)							
Ammonia as N by Discrete analyser	EK055G	2	10	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	6	42	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	3	24	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	3	26	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Control Samples (LCS) - Continued							
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	42	**9.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	10	**10.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	42	**9.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	24	**8.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	4	42	**9.5**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	24	**8.3**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	26	**7.7**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
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 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.
Ammonia as N by Discrete analyser	EK055G	SOIL	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	SOIL	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)
Volatile Organic Compounds	EP074	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
Semivolatile Organic Compounds	EP075	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 502)
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.
Total Cyanide	EK026-PR	SOIL	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Deionised Water Leach	EN60-Dla	SOIL	AS4439.3 Preparation of Leachates
Deionised Water Leach - Zero Headspace Extraction	EN60Z-Dla	SOIL	AS4439.2 Preparation of Leachates
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
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.
Volatiles Water Preparation	ORG16-W	SOIL	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Preparation Methods	Method	Matrix	Method Descriptions
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							
EK055: Ammonia as N	ES1104964-002	BH401_10-10.4	**Ammonia as N**	7664-41-7	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP074A: Monocyclic Aromatic Hydrocarbons	ES1105032-001	Anonymous	**Benzene**	71-43-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **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

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075S: Acid Extractable Surrogates	ES1104964-004	BH402_15-15.5	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1104964-004	BH402_15-15.5	**Phenol-d6**	13127-88-3	111 %	12.5-110.6 %	**Recovery greater than upper data quality objective**

Sub-Matrix: **DI WATER LEACHATE**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075S: Acid Extractable Surrogates	ES1104964-007	BH403_15-15.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1104964-006	BH403_10-10.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1104964-007	BH403_15-15.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1104964-006	BH403_10-10.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1104964-006	BH403_10-10.4	**2-Fluorobiphenyl**	321-60-8	142 %	27.2-134.9 %	**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.

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
EA055: Moisture Content							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	----	----	----	10-MAR-2011	23-FEB-2011	**15**
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	----	----	----	10-MAR-2011	24-FEB-2011	**14**
Soil Glass Jar - Unpreserved BH401_20-20.15		----	----	----	10-MAR-2011	25-FEB-2011	**13**
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	----	----	----	10-MAR-2011	28-FEB-2011	**10**
Soil Glass Jar - Unpreserved BH409_6.0-6.4		----	----	----	10-MAR-2011	01-MAR-2011	**9**
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	14-MAR-2011	16-FEB-2011	**26**	----	----	----
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	14-MAR-2011	17-FEB-2011	**25**	----	----	----
Soil Glass Jar - Unpreserved BH401_20-20.15		14-MAR-2011	18-FEB-2011	**24**	----	----	----
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	14-MAR-2011	21-FEB-2011	**21**	----	----	----
Soil Glass Jar - Unpreserved BH409_6.0-6.4		14-MAR-2011	22-FEB-2011	**20**	----	----	----
EN60: Bottle Leaching Procedure							
LabSplit: Leach for organics and other tests BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	----	----	----	12-MAR-2011	23-FEB-2011	**17**
LabSplit: Leach for organics and other tests BH402_16-16.3		----	----	----	12-MAR-2011	24-FEB-2011	**16**
LabSplit: Leach for organics and other tests BH400_15-15.4,	BH407_15.1-15.45	----	----	----	12-MAR-2011	28-FEB-2011	**12**
LabSplit: Leach for organics and other tests BH409_6.0-6.4		----	----	----	12-MAR-2011	01-MAR-2011	**11**
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)							
Lab Split: ZHE leach for VOC & CN BH402_15-15.5,	BH403_10-10.4	----	----	----	15-MAR-2011	16-FEB-2011	**27**
Lab Split: ZHE leach for VOC & CN BH403_15-15.4		----	----	----	16-MAR-2011	16-FEB-2011	**28**

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
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction) - Analysis Holding Time Compliance							
Lab Split: ZHE leach for VOC & CN BH401_10-10.4		----	----	----	14-MAR-2011	17-FEB-2011	**25**
Lab Split: ZHE leach for VOC & CN BH402_16-16.3		----	----	----	15-MAR-2011	17-FEB-2011	**26**
Lab Split: ZHE leach for VOC & CN BH401_20-20.15		----	----	----	15-MAR-2011	18-FEB-2011	**25**
Lab Split: ZHE leach for VOC & CN BH400_15-15.4		----	----	----	14-MAR-2011	21-FEB-2011	**21**
Lab Split: ZHE leach for VOC & CN BH407_15.1-15.45		----	----	----	16-MAR-2011	21-FEB-2011	**23**
Lab Split: ZHE leach for VOC & CN BH409_6.0-6.4		----	----	----	16-MAR-2011	22-FEB-2011	**22**
EP074A: Monocyclic Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	10-MAR-2011	23-FEB-2011	**15**	15-MAR-2011	23-FEB-2011	**20**
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	10-MAR-2011	24-FEB-2011	**14**	15-MAR-2011	24-FEB-2011	**19**
Soil Glass Jar - Unpreserved BH401_20-20.15		10-MAR-2011	25-FEB-2011	**13**	15-MAR-2011	25-FEB-2011	**18**
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	10-MAR-2011	28-FEB-2011	**10**	15-MAR-2011	28-FEB-2011	**15**
Soil Glass Jar - Unpreserved BH409_6.0-6.4		10-MAR-2011	01-MAR-2011	**9**	15-MAR-2011	01-MAR-2011	**14**
EP075B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	10-MAR-2011	23-FEB-2011	**15**	----	----	----
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	10-MAR-2011	24-FEB-2011	**14**	----	----	----
Soil Glass Jar - Unpreserved BH401_20-20.15		10-MAR-2011	25-FEB-2011	**13**	----	----	----
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	10-MAR-2011	28-FEB-2011	**10**	----	----	----
Soil Glass Jar - Unpreserved BH409_6.0-6.4		10-MAR-2011	01-MAR-2011	**9**	----	----	----
EP075H: Anilines and Benzidines							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	10-MAR-2011	23-FEB-2011	**15**	----	----	----

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
EP075H: Anilines and Benzidines - Analysis Holding Time Compliance							
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	10-MAR-2011	24-FEB-2011	**14**	----	----	----
Soil Glass Jar - Unpreserved BH401_20-20.15		10-MAR-2011	25-FEB-2011	**13**	----	----	----
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	10-MAR-2011	28-FEB-2011	**10**	----	----	----
Soil Glass Jar - Unpreserved BH409_6.0-6.4		10-MAR-2011	01-MAR-2011	**9**	----	----	----
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	10-MAR-2011	23-FEB-2011	**15**	----	----	----
Soil Glass Jar - Unpreserved BH402_15-15.5, BH403_15-15.4	BH403_10-10.4,	10-MAR-2011	23-FEB-2011	**15**	15-MAR-2011	23-FEB-2011	**20**
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	10-MAR-2011	24-FEB-2011	**14**	----	----	----
Soil Glass Jar - Unpreserved BH401_10-10.4,	BH402_16-16.3	10-MAR-2011	24-FEB-2011	**14**	15-MAR-2011	24-FEB-2011	**19**
Soil Glass Jar - Unpreserved BH401_20-20.15		10-MAR-2011	25-FEB-2011	**13**	----	----	----
Soil Glass Jar - Unpreserved BH401_20-20.15		10-MAR-2011	25-FEB-2011	**13**	15-MAR-2011	25-FEB-2011	**18**
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	10-MAR-2011	28-FEB-2011	**10**	----	----	----
Soil Glass Jar - Unpreserved BH400_15-15.4,	BH407_15.1-15.45	10-MAR-2011	28-FEB-2011	**10**	15-MAR-2011	28-FEB-2011	**15**
Soil Glass Jar - Unpreserved BH409_6.0-6.4		10-MAR-2011	01-MAR-2011	**9**	----	----	----
Soil Glass Jar - Unpreserved BH409_6.0-6.4		10-MAR-2011	01-MAR-2011	**9**	15-MAR-2011	01-MAR-2011	**14**

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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1105851**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI -REBATCH OF ES1102875 ES1103336 ES1103042	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: REBATCH OF ES1103960	Date Samples Received	: 21-MAR-2011
Sampler	: LK, KO	Issue Date	: 25-MAR-2011
Site	: ----		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EP132: Poor duplicate and matrix spike recovery due to sample matrix interferences.**
- **EP132: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogates not determined due to sample matrix interferences.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH406_16.0-16.5	BH403_8.0-8.4	BH403_12-12.4	BH405_7.0-7.3	BH405_14.0-14.4
				Client sampling date / time: 09-FEB-2011 15:00	09-FEB-2011 15:00	09-FEB-2011 15:00	10-FEB-2011 15:00	11-FEB-2011 15:00
				ES1105851-001	ES1105851-002	ES1105851-003	ES1105851-004	ES1105851-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**14.1**	**36.5**	**13.1**	**16.7**	**16.3**
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/kg	<250	<20	<250	<10	<20
4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<250	<20	<250	<10	<20
m-Cresol	108-39-4	10	µg/kg	**250000**	**2000**	**670000**	<10	**920**
o-Cresol	95-48-7	10	µg/kg	**218000**	**1550**	**503000**	<10	**1500**
p-Cresol	106-44-5	10	µg/kg	**175000**	**1370**	**449000**	<10	**510**
2.4-Dichlorophenol	120-83-2	10	µg/kg	<250	<20	<250	<10	<20
2.6-Dichlorophenol	87-65-0	10	µg/kg	<250	<20	<250	<10	<20
2.4-Dimethylphenol	105-67-9	10	µg/kg	**326000**	**1340**	**380000**	<10	**4900**
Hexachlorophene	70-30-4	10	µg/kg	<250	<20	<250	<10	<20
2-Nitrophenol	88-75-5	10	µg/kg	<250	<20	<250	<10	<20
4-Nitrophenol	100-02-7	10	µg/kg	<250	<20	<250	<10	<20
Pentachlorophenol	87-86-5	10	µg/kg	<250	<20	<250	<10	<20
Phenol	108-95-2	10	µg/kg	**20900**	**2000**	**616000**	<10	<20
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<250	<20	<250	<10	<20
2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<250	<20	<250	<10	<20
2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<250	<20	<250	<10	<20
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**63.0**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**59.4**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**64.2**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**71.8**	**Not Determined**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**66.7**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**68.4**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**74.6**	**Not Determined**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH409_3.7-4.0	BH409_7.0-7.3	BH408_2.0-2.4	BH408_9.0-9.4	----
				Client sampling date / time: 14-FEB-2011 15:00	15-FEB-2011 15:00	14-FEB-2011 15:00	15-FEB-2011 15:00	----
				ES1105851-006	ES1105851-007	ES1105851-008	ES1105851-009	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**16.7**	**15.4**	**12.7**	**17.2**	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/kg	<10	<10	<10	<50	----
4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<10	<10	<10	<50	----
m-Cresol	108-39-4	10	µg/kg	<10	**30**	**20**	<50	----
o-Cresol	95-48-7	10	µg/kg	<10	**90**	**20**	<50	----
p-Cresol	106-44-5	10	µg/kg	<10	**60**	**20**	<50	----
2.4-Dichlorophenol	120-83-2	10	µg/kg	<10	<10	<10	<50	----
2.6-Dichlorophenol	87-65-0	10	µg/kg	<10	<10	<10	<50	----
2.4-Dimethylphenol	105-67-9	10	µg/kg	<10	**40**	**30**	<50	----
Hexachlorophene	70-30-4	10	µg/kg	<10	<10	<10	<50	----
2-Nitrophenol	88-75-5	10	µg/kg	<10	<10	<10	<50	----
4-Nitrophenol	100-02-7	10	µg/kg	<10	<10	<10	<50	----
Pentachlorophenol	87-86-5	10	µg/kg	<10	<10	<10	<50	----
Phenol	108-95-2	10	µg/kg	**10**	<10	<10	<50	----
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<10	<10	<10	<50	----
2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<10	<10	<10	<50	----
2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<10	<10	<10	<50	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**74.6**	**Not Determined**	**92.0**	**Not Determined**	----
Phenol-d6	13127-88-3	0.1	%	**74.6**	**Not Determined**	**90.1**	**Not Determined**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**76.1**	**75.8**	**91.0**	**Not Determined**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**87.7**	**98.0**	**97.3**	**Not Determined**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**77.2**	**93.6**	**94.3**	**Not Determined**	----
Anthracene-d10	1719-06-8	0.1	%	**82.2**	**104**	**95.0**	**Not Determined**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**90.1**	**91.3**	**106**	**Not Determined**	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

S447

Fadi Soro

From: Jennifer Cullen
Sent: Monday, 21 March 2011 1:06 PM
To: Fadi Soro; Samples Sydney
Subject: FW: Additional Analysis - Barangaroo

Hi Fadi,

Could you please locate these samples and line them up on the bench?

Once this is done could you let me know so that I can come down and see them all. We will probably be rebatching them.

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen
SENIOR PROJECT MANAGER

ALS | Environmental Division

Address
277-289 Woodpark Road, Smithfield, NSW, 2164

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FAX +61 2 8784 8500

www.alsglobal.com

Please consider the environment before printing this email.

Telephone : +61-2-8784 8555

ES1105851

Work Order
Sydney
Environmental Division

S446

60

From: McGrath, Kate [mailto:Kate.O'Brien@aecom.com]
Sent: Monday, 21 March 2011 1:02 PM
To: Jennifer Cullen
Cc: Smith, Garry (Sydney)
Subject: Additional Analysis - Barangaroo

Hi Jenny,

Is there enough sample in the below soil samples for phenols analysis?

SDG	SampleCode	Field_ID	Sampled_Date_Time
ES1102875	ES1102875015	BH406_16.0-16.5 (1)	9/02/2011
ES1102973	ES1102973002	BH403_8.0-8.4 (2)	9/02/2011
ES1102973	ES1102973003	BH403_12-12.4 (3)	9/02/2011
ES1103042	ES1103042008	BH405_7.0-7.3 (4)	10/02/2011
ES1103042	ES1103042012	BH405_14.0-14.4 (5)	11/02/2011
ES1103336	ES1103336002	BH409_3.7-4.0 (6)	14/02/2011
ES1103336	ES1103336006	BH409_7.0-7.3 (7)	15/02/2011
ES1103336	ES1103336009	BH408_2.0-2.4 (8)	14/02/2011
ES1103336	ES1103336013	BH408_9.0-9.4 (9)	15/02/2011

(1) = ES3960 #6
(2) = ES3960 #1
(3) = ES3960 #2
(4) = ES3960 #3
(5) = ES3960 #4
(6) = ES3960 #9
(7) = ES3960 #10
(8) = ES3960 #7
(9) = ES3960 #8

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1105851**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI -REBATCH OF ES1102875 ES1103336 ES1103042	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: REBATCH OF ES1103960	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK, KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-MAR-2011	Issue Date	: 21-MAR-2011 16:05
Client Requested Due Date	: 24-MAR-2011	Scheduled Reporting Date	: **24-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 15.2'C
No. of coolers/boxes	: REBATCH	No. of samples received	: 9
Security Seal	: Not intact.	No. of samples analysed	: 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **This is a rebatch of ES1102875, ES1102973, ES1103042, ES1103336**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EA055-103 Moisture Content	SOIL - EP132A Phenols Ultratrace - 16 analytes
ES1105851-001	09-FEB-2011 15:00	BH406_16.0-16.5	✓	✓
ES1105851-002	09-FEB-2011 15:00	BH403_8.0-8.4	✓	✓
ES1105851-003	09-FEB-2011 15:00	BH403_12-12.4	✓	✓
ES1105851-004	10-FEB-2011 15:00	BH405_7.0-7.3	✓	✓
ES1105851-005	11-FEB-2011 15:00	BH405_14.0-14.4	✓	✓
ES1105851-006	14-FEB-2011 15:00	BH409_3.7-4.0	✓	✓
ES1105851-007	15-FEB-2011 15:00	BH409_7.0-7.3	✓	✓
ES1105851-008	14-FEB-2011 15:00	BH408_2.0-2.4	✓	✓
ES1105851-009	15-FEB-2011 15:00	BH408_9.0-9.4	✓	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1105851**	Page	: 1 of 5
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI -REBATCH OF ES1102875 ES1103336 ES1103042	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: REBATCH OF ES1103960	Date Samples Received	: 21-MAR-2011
Sampler	: LK, KO	Issue Date	: 25-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Quality Control Report contains the following information:

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

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*
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics

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: 1715301)									
ES1105832-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.6	18.8	18.6	0% - 50%
ES1105832-010	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	21.0	20.3	3.3	0% - 20%
EA055: Moisture Content (QC Lot: 1715302)									
ES1105851-008	BH408_2.0-2.4	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.7	11.5	10.5	0% - 50%
EP132A: Phenolic Compounds (QC Lot: 1715416)									
ES1105851-001	BH406_16.0-16.5	EP132: 2-Chlorophenol	95-57-8	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<250	<250	0.0	No Limit
		EP132: m-Cresol	108-39-4	10	µg/kg	250000	192000	# 26.3	0% - 20%
		EP132: o-Cresol	95-48-7	10	µg/kg	218000	175000	# 22.2	0% - 20%
		EP132: p-Cresol	106-44-5	10	µg/kg	175000	148000	16.2	0% - 20%
		EP132: 2.4-Dichlorophenol	120-83-2	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 2.6-Dichlorophenol	87-65-0	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 2.4-Dimethylphenol	105-67-9	10	µg/kg	326000	244000	# 28.6	0% - 20%
		EP132: Hexachlorophene	70-30-4	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 2-Nitrophenol	88-75-5	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 4-Nitrophenol	100-02-7	10	µg/kg	<250	<250	0.0	No Limit
		EP132: Pentachlorophenol	87-86-5	10	µg/kg	<250	<250	0.0	No Limit
		EP132: Phenol	108-95-2	10	µg/kg	20900	26200	# 22.2	0% - 20%
		EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<250	<250	0.0	No Limit
		EP132: 2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<250	<250	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
EP132A: Phenolic Compounds (QCLot: 1715416)								
EP132: 2-Chlorophenol	95-57-8	10	µg/kg	<10	100 µg/kg	93.2	56.2	115
EP132: 4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<10	100 µg/kg	102	60.1	121
EP132: m-Cresol	108-39-4	10	µg/kg	<10	100 µg/kg	91.3	44.7	119
EP132: o-Cresol	95-48-7	10	µg/kg	<10	100 µg/kg	81.5	32.6	98
EP132: p-Cresol	106-44-5	10	µg/kg	<10	100 µg/kg	78.0	39.1	99.9
EP132: 2.4-Dichlorophenol	120-83-2	10	µg/kg	<10	100 µg/kg	82.7	38.1	115
EP132: 2.6-Dichlorophenol	87-65-0	10	µg/kg	<10	100 µg/kg	88.1	52.1	116
EP132: 2.4-Dimethylphenol	105-67-9	10	µg/kg	<10	100 µg/kg	49.0	19.7	83.1
EP132: Hexachlorophene	70-30-4	10	µg/kg	<10	100 µg/kg	55.4	9.02	80
EP132: 2-Nitrophenol	88-75-5	10	µg/kg	<10	100 µg/kg	69.1	26.8	121
EP132: 4-Nitrophenol	100-02-7	10	µg/kg	<10	100 µg/kg	80.2	36.1	116
EP132: Pentachlorophenol	87-86-5	10	µg/kg	<10	100 µg/kg	80.9	32.4	81.6
EP132: Phenol	108-95-2	10	µg/kg	<10	100 µg/kg	89.1	48.2	129
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<10	100 µg/kg	67.4	30.4	92.8
EP132: 2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<10	100 µg/kg	83.0	47.3	111
EP132: 2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<10	100 µg/kg	79.5	31.2	107

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
EP132A: Phenolic Compounds (QCLot: 1715416)							
ES1105851-001	BH406_16.0-16.5	EP132: 2-Chlorophenol	95-57-8	100 µg/kg	# Not Determined	23	130
		EP132: 4-Chloro-3-Methylphenol	59-50-7	100 µg/kg	# Not Determined	42	125
		EP132: m-Cresol	108-39-4	100 µg/kg	# Not Determined	25	123
		EP132: o-Cresol	95-48-7	100 µg/kg	# Not Determined	25	121
		EP132: p-Cresol	106-44-5	100 µg/kg	# Not Determined	12	137
		EP132: 2.4-Dichlorophenol	120-83-2	100 µg/kg	# Not Determined	25	124
		EP132: 2.6-Dichlorophenol	87-65-0	100 µg/kg	# Not Determined	33	126
		EP132: 2.4-Dimethylphenol	105-67-9	100 µg/kg	# Not Determined	0	127
		EP132: Hexachlorophene	70-30-4	100 µg/kg	# Not Determined	10	138
		EP132: 2-Nitrophenol	88-75-5	100 µg/kg	# Not Determined	17	165
		EP132: 4-Nitrophenol	100-02-7	100 µg/kg	# Not Determined	31	146
		EP132: Pentachlorophenol	87-86-5	100 µg/kg	# Not Determined	28	121
		EP132: Phenol	108-95-2	100 µg/kg	# Not Determined	0	142
		EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	100 µg/kg	# Not Determined	21	114
		EP132: 2.4.5-Trichlorophenol	95-95-4	100 µg/kg	# Not Determined	32	119
		EP132: 2.4.6-Trichlorophenol	88-06-2	100 µg/kg	# Not Determined	30	122

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1105851**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI -REBATCH OF ES1102875 ES1103336 ES1103042	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: REBATCH OF ES1103960	Date Samples Received	: 21-MAR-2011
Sampler	: LK, KO	Issue Date	: 25-MAR-2011
Order number	: 39540AUS	No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **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							
Lab Split: Managed Moisture for Dry Weight Det. BH406_16.0-16.5, BH403_8.0-8.4, BH403_12-12.4	**09-FEB-2011**	**----**	----	----	**21-MAR-2011**	08-AUG-2011	✓
Lab Split: Managed Moisture for Dry Weight Det. BH405_7.0-7.3	**10-FEB-2011**	**----**	----	----	**21-MAR-2011**	09-AUG-2011	✓
Lab Split: Managed Moisture for Dry Weight Det. BH405_14.0-14.4	**11-FEB-2011**	**----**	----	----	**21-MAR-2011**	10-AUG-2011	✓
Lab Split: Managed Moisture for Dry Weight Det. BH409_3.7-4.0, BH408_2.0-2.4	**14-FEB-2011**	**----**	----	----	**21-MAR-2011**	13-AUG-2011	✓
Lab Split: Managed Moisture for Dry Weight Det. BH409_7.0-7.3, BH408_9.0-9.4	**15-FEB-2011**	**----**	----	----	**21-MAR-2011**	14-AUG-2011	✓
EP132A: Phenolic Compounds							
Soil Glass Jar - Unpreserved BH406_16.0-16.5, BH403_8.0-8.4, BH403_12-12.4	**09-FEB-2011**	**21-MAR-2011**	23-FEB-2011	×	**22-MAR-2011**	30-APR-2011	✓
Soil Glass Jar - Unpreserved BH405_7.0-7.3	**10-FEB-2011**	**21-MAR-2011**	24-FEB-2011	×	**22-MAR-2011**	30-APR-2011	✓
Soil Glass Jar - Unpreserved BH405_14.0-14.4	**11-FEB-2011**	**21-MAR-2011**	25-FEB-2011	×	**22-MAR-2011**	30-APR-2011	✓
Soil Glass Jar - Unpreserved BH409_3.7-4.0, BH408_2.0-2.4	**14-FEB-2011**	**21-MAR-2011**	28-FEB-2011	×	**22-MAR-2011**	30-APR-2011	✓
Soil Glass Jar - Unpreserved BH409_7.0-7.3, BH408_9.0-9.4	**15-FEB-2011**	**21-MAR-2011**	01-MAR-2011	×	**22-MAR-2011**	30-APR-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	3	22	**13.6**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	9	**11.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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).
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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							
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**m-Cresol**	108-39-4	26.3 %	0-20%	**RPD exceeds LOR based limits**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**o-Cresol**	95-48-7	22.2 %	0-20%	**RPD exceeds LOR based limits**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.4-Dimethylphenol**	105-67-9	28.6 %	0-20%	**RPD exceeds LOR based limits**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**Phenol**	108-95-2	22.2 %	0-20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2-Chlorophenol**	95-57-8	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**4-Chloro-3-Methylphenol**	59-50-7	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**m-Cresol**	108-39-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**o-Cresol**	95-48-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**p-Cresol**	106-44-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.4-Dichlorophenol**	120-83-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.6-Dichlorophenol**	87-65-0	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.4-Dimethylphenol**	105-67-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**Hexachlorophene**	70-30-4	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2-Nitrophenol**	88-75-5	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**4-Nitrophenol**	100-02-7	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**Pentachlorophenol**	87-86-5	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**Phenol**	108-95-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.3.4.6-Tetrachlorophenol**	58-90-2	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.4.5-Trichlorophenol**	95-95-4	Not Determined	----	**Matrix spike recovery not determined due to sample matrix interference.**
EP132A: Phenolic Compounds	ES1105851-001	BH406_16.0-16.5	**2.4.6-Trichlorophenol**	88-06-2	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

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132S: Acid Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-003	BH403_12-12.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-007	BH409_7.0-7.3	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-003	BH403_12-12.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-007	BH409_7.0-7.3	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-003	BH403_12-12.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132S: Acid Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-003	BH403_12-12.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-003	BH403_12-12.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-003	BH403_12-12.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-002	BH403_8.0-8.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-001	BH406_16.0-16.5	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-003	BH403_12-12.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-005	BH405_14.0-14.4	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1105851-009	BH408_9.0-9.4	**4-Terphenyl-d14**	1718-51-0	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.

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
EP132A: Phenolic Compounds						
Soil Glass Jar - Unpreserved BH406_16.0-16.5, BH403_8.0-8.4, BH403_12-12.4	21-MAR-2011	23-FEB-2011	**26**	----	----	----
Soil Glass Jar - Unpreserved BH405_7.0-7.3	21-MAR-2011	24-FEB-2011	**25**	----	----	----
Soil Glass Jar - Unpreserved BH405_14.0-14.4	21-MAR-2011	25-FEB-2011	**24**	----	----	----
Soil Glass Jar - Unpreserved BH409_3.7-4.0, BH408_2.0-2.4	21-MAR-2011	28-FEB-2011	**21**	----	----	----
Soil Glass Jar - Unpreserved BH409_7.0-7.3, BH408_9.0-9.4	21-MAR-2011	01-MAR-2011	**20**	----	----	----

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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1107354**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 61 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 06-APR-2011
Sampler	: LK	Issue Date	: 14-APR-2011
Site	: ----		
		No. of samples received	: 14
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
		Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020: LCS recoveries for some elements fall outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH413_1.1-1.3	BH413_4.0-4.2	BH413_6.0-6.15	BH413_9.0-9.2	BH413_15.0-15.5
				Client sampling date / time: 01-APR-2011 15:00	01-APR-2011 15:00	01-APR-2011 15:00	01-APR-2011 15:00	05-APR-2011 15:00
				ES1107354-001	ES1107354-002	ES1107354-003	ES1107354-004	ES1107354-005
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	14.0	21.3	15.3	22.4	33.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	5	<5	8
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	7	13	8	19
Copper	7440-50-8	5	mg/kg	49	34	<5	29	71
Lead	7439-92-1	5	mg/kg	485	219	14	111	429
Nickel	7440-02-0	2	mg/kg	13	5	<2	4	8
Zinc	7440-66-6	5	mg/kg	195	181	7	48	310
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	3.7	0.2	<0.1	1.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Acenaphthylene	208-96-8	0.5	mg/kg	1.3	1.1	<0.5	<0.5	1.0
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	0.6	<0.5	<0.5	0.8
Fluorene	86-73-7	0.5	mg/kg	<0.5	1.0	<0.5	<0.5	1.0
Phenanthrene	85-01-8	0.5	mg/kg	12.8	9.9	<0.5	<0.5	6.2
Anthracene	120-12-7	0.5	mg/kg	3.4	2.8	<0.5	<0.5	2.2
Fluoranthene	206-44-0	0.5	mg/kg	25.3	17.8	1.1	0.8	14.5
Pyrene	129-00-0	0.5	mg/kg	26.1	29.8	1.8	2.0	14.8
Benz(a)anthracene	56-55-3	0.5	mg/kg	13.2	11.9	0.6	<0.5	7.4
Chrysene	218-01-9	0.5	mg/kg	12.4	8.7	<0.5	<0.5	7.1
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	14.6	9.6	0.7	0.6	9.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.9	3.9	<0.5	<0.5	2.7
Benzo(a)pyrene	50-32-8	0.5	mg/kg	12.1	8.9	0.6	0.5	8.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	4.6	2.6	<0.5	<0.5	3.0
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.5	0.8	<0.5	<0.5	0.9
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.9	2.7	<0.5	<0.5	3.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	70	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	520	1250	<100	<100	800
C29 - C36 Fraction	----	100	mg/kg	380	1260	<100	<100	750
^ C10 - C36 Fraction (sum)	----	50	mg/kg	900	2580	<50	<50	1550
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH413_1.1-1.3	BH413_4.0-4.2	BH413_6.0-6.15	BH413_9.0-9.2	BH413_15.0-15.5
				Client sampling date / time: 01-APR-2011 15:00	01-APR-2011 15:00	01-APR-2011 15:00	01-APR-2011 15:00	05-APR-2011 15:00
				ES1107354-001	ES1107354-002	ES1107354-003	ES1107354-004	ES1107354-005
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	**100**	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	**780**	**2150**	<100	<100	**1280**
>C34 - C40 Fraction	----	100	mg/kg	**410**	**830**	<100	<100	**470**
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**1190**	**3080**	<50	<50	**1750**
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**76.5**	**89.7**	**87.1**	**92.7**	**86.6**
2-Chlorophenol-D4	93951-73-6	0.1	%	**76.1**	**90.2**	**89.4**	**94.6**	**86.7**
2.4.6-Tribromophenol	118-79-6	0.1	%	**68.2**	**78.4**	**76.4**	**77.1**	**78.0**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**80.7**	**94.8**	**92.2**	**96.3**	**90.4**
Anthracene-d10	1719-06-8	0.1	%	**80.4**	**95.4**	**93.5**	**97.1**	**89.0**
4-Terphenyl-d14	1718-51-0	0.1	%	**89.0**	**107**	**108**	**111**	**103**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**105**	**109**	**112**	**115**	**93.4**
Toluene-D8	2037-26-5	0.1	%	**90.2**	**96.6**	**90.2**	**106**	**83.2**
4-Bromofluorobenzene	460-00-4	0.1	%	**94.1**	**99.1**	**97.5**	**108**	**86.7**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH413_16.4-16.6	QC622	----	----	----
				Client sampling date / time	05-APR-2011 15:00	05-APR-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1107354-006	ES1107354-008	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		14.3	34.0	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	8	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		2	21	----	----	----
Copper	7440-50-8	5	mg/kg		<5	66	----	----	----
Lead	7439-92-1	5	mg/kg		16	544	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	9	----	----	----
Zinc	7440-66-6	5	mg/kg		<5	378	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	1.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	0.6	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	1.1	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	1.0	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	1.2	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	7.4	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	2.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	16.3	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	17.0	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	8.2	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	8.1	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	10.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	3.1	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	9.3	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	3.2	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	0.9	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	3.4	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	70	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	1010	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	900	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	1980	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	<10	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH413_16.4-16.6	QC622	----	----	----
				Client sampling date / time: 05-APR-2011 15:00	05-APR-2011 15:00	----	----	----
				ES1107354-006	ES1107354-008	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	**110**	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	**1590**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	**560**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	**2260**	----	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	----
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**87.2**	**89.8**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**88.4**	**90.7**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**71.6**	**78.8**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**90.5**	**93.0**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**91.2**	**92.3**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**106**	**104**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**109**	**116**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**98.0**	**109**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	**113**	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC621	QC624	----	----	----
				Client sampling date / time: 01-APR-2011 15:00	05-APR-2011 15:00	----	----	----
				ES1107354-007	ES1107354-009	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	----	----	----
C15 - C28 Fraction	----	100	µg/L	**140**	**110**	----	----	----
C29 - C36 Fraction	----	50	µg/L	**90**	**100**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	**230**	**210**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	----	----	----
>C16 - C34 Fraction	----	100	µg/L	**170**	**170**	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC621	QC624	----	----	----
				Client sampling date / time: 01-APR-2011 15:00	05-APR-2011 15:00	----	----	----
				ES1107354-007	ES1107354-009	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
^ >C10 - C40 Fraction (sum)	----	100	µg/L	**170**	**170**	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	----	----
Toluene	108-88-3	2	µg/L	<5	<5	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**24.7**	**21.2**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**51.9**	**46.5**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**61.5**	**56.0**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**63.6**	**52.2**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**67.1**	**65.2**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**53.2**	**57.2**	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**83.7**	**89.0**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**84.2**	**85.8**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**79.7**	**80.9**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Form:

page 1 of 2

AECOM

Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 61 **Purchase Order Number:** 39154CMUS

Sample collected by: Lauren Kouvis **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: CSDAT

Subcon / Forward Lab / Split WO (ECL)
Lab / Analysis: MGT Labmark
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No.:
Attach By PO / Internal Sheet:

1. Urgent TAT required? (please circle: 24hr 48hr ____ days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extraction?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☒ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8452	☐ Yes	☐ No	☐ N/A

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Soil - 2,3,7,8 tetrachloro dibenzo-p-dioxin	8 metals/TPH/BTEX	PAH	HEM	TPH/BTEX/VOCs	TPH/BTEX/VOCs	PAH/Phenols	Soil - PAH/Phenols	Remarks & comments
1	BH413_1-1-1.3	1-4-11		X					X		bar.				X					Please contact Kate O'Brien regarding samples to be analysed
(10)	BH413_2-0-2.3			X					X						X					
2	BH413_4.0-4.2			X					X						X					
(11)	BH413_5-0-5.15			X					X						X					
3	BH413_6-0-6.15			X					X						X					
(12)	BH413_8-0-8.1			X					X						X					
4	BH413_9.0-9.2			X					X						X					
(13)	BH413_10.0-10.2			X					X						X					
5	BH413_15.0-15.5	5-4-11		X					X						X					
(14)	BH413_16-0-16.2	↓		X					X		↓				X					

Relinquished By:	Received by:
Name: Lauren Kouvis Date: 6.4.11	Name: Sam 6/4/11
of: AECOM Time: 9:00	of: ALS 1:45
Relinquished By:	Received by:
Name: Date:	Name:
of: Time:	of:

Printed copies of this document

Environmental Division
Sydney
Work Order
ES1107354

Telephone : +61-2-8784 8555

No/NA Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
No/NA Consignment Note No.
No/NA Transport Co:
Date:
No/NA Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
No/NA Consignment Note No.
No/NA Transport Co:

URGENT

Form:

AECOM

Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.OBrien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref.
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6 1 **Purchase Order Number:** 39546AUS

Sample collected by: Lauren Kovtus. **Sample Results to be returned to:** Anthony Davis / Kate McBrien

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8152

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Remarks & comments
6	BH413_16-4-16.6	5-4-11							X		1jar	see note page 1.
7	QC621	1-4-11			X				X		2V, 1A, 1P	
8	QC622	5-4-11		X					X		1jar	
*	QC623	5-4-11		X					X		1jar	
9	QC624	5-4-11			X				X		2V, 1A, 1P	

Remarks & comments: Metals As, Cd, Cu, Cr, Ni, Pb, Hg, Zn

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Lauren Kovtus Date: 6.4.11	Name: Sam 6/4/11 Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 9:00	of: ALS 1245 Time:		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	**Received in good condition?**	Yes/No/NA	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: Date:	**Samples received chilled?**	Yes/No/NA	**Consignment Note No.**	
of: Time:	of: Time:		Yes/No/NA	**Transport Co:**	

~~Printed copies of this document are uncontrolled~~

Wael Saleh

From: McGrath, Kate [Kate.O'Brien@aecom.com]
Sent: Thursday, 7 April 2011 2:25 PM
To: Wael Saleh
Cc: Davis, Anthony
Subject: RE: Barangaroo Samples April 1st and 5th ON HOLD

Hi Wael,

URGENT

Could we please get the following soil samples analysed for metals (As, Cd, Cu, Cr, Ni, Pb, Hg and Zn) TPH, BTEX, PAH:

BH413_1.1-1.3

BH413_4.0-4.2

BH413_6.0-6.15

BH413_9.0-9.2

BH413_15.0-15.5

BH413_16.4-16.6

QC622

Subcon / Forward Lab / Split WO
Lab / Analysis: Forward MGT Labmark
Organised By / Date: _____
Relinquished By / Date: _____
Connote / Courier: _____
WO No: EB1107354
Attach By PO / Internal Sheet: _____

Please analyse water samples QC621 and QC624 for metals*, TPH, BTEX, PAH

Please send QC623 to MGT Labmark Lane Cove for analysis – metals/TPH/BTEX/PAH

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072
PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

Please consider the environment before printing this email.

From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Thursday, April 07, 2011 1:33 PM
To: McGrath, Kate
Subject: Barangaroo Samples April 1st and 5th ON HOLD
Importance: High

Hi Kate,

Please see attached file. Please indicate which samples require to be analysed.

Thanks and regards

How was your customer experience? Please send us your feedback

Wael Saleh

Creation/Committal Coordinator

ALS Environmental

277 Woodpark Road

Smithfield, NSW, 2164

Direct: +61 2 8784 8513

Phone: +61 2 8784 8555

Fax: +61 2 8784 8500

Email: wael.saleh@alsglobal.com

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1107354**		
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 61 BARANGAROO	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 06-APR-2011	Issue Date	: 20-APR-2011 16:14
Client Requested Due Date	: 02-MAY-2011	Scheduled Reporting Date	: **02-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.6'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 14
Security Seal	: Intact.	No. of samples analysed	: 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- Samples received in appropriately pretreated and preserved containers.
- This is an updated SRA which indicates the new scheduled release date for this work order.
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Analysis added on 20/04/11 Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **Sample id QC623 sent to MGT Labmark as per Kate O'Brien on 07/04/11 at 04:25 pm**
- **Additional analysis added on samples #1, 2, 4, 5 and 6 on 20/04/11.**
- **Holding times on Di Leach analysis is 14 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EK055G Ammonia as N By Discrete Analyser	SOIL - EK055-SD Ammonia in Sediments by Steam Distillation	SOIL - EP071(SV-TPH-WD) Total Petroleum Hydrocarbons (TPH)	SOIL - S-26 8 metals/TPH/BTEX/PAH	SOIL - UTO-5W Ultratrace PAH/Phenols
ES1107354-001	01-APR-2011 15:00	BH413_1.1-1.3		✓	✓	✓	✓	✓
ES1107354-002	01-APR-2011 15:00	BH413_4.0-4.2		✓	✓	✓	✓	✓
ES1107354-003	01-APR-2011 15:00	BH413_6.0-6.15					✓	
ES1107354-004	01-APR-2011 15:00	BH413_9.0-9.2		✓	✓	✓	✓	✓
ES1107354-005	05-APR-2011 15:00	BH413_15.0-15.5		✓	✓	✓	✓	✓
ES1107354-006	05-APR-2011 15:00	BH413_16.4-16.6		✓	✓	✓	✓	✓
ES1107354-008	05-APR-2011 15:00	QC622					✓	
ES1107354-010	01-APR-2011 15:00	BH413_2.0-2.3	✓					
ES1107354-011	01-APR-2011 15:00	BH413_5.0-5.15	✓					
ES1107354-012	01-APR-2011 15:00	BH413_8.0-8.1	✓					
ES1107354-013	01-APR-2011 15:00	BH413_10.0-10.2	✓					
ES1107354-014	05-APR-2011 15:00	BH413_16.0-16.2	✓					

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1107354-007	01-APR-2011 15:00	QC621	✓
ES1107354-009	05-APR-2011 15:00	QC624	✓

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	accounts.env@aecom.com
MR ANTHONY DAVIS		
- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com
MS JENNIFER CULLEN		
- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com
MS KATE MCGRATH		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com
MS KATE O BRIEN		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- A4 - AU Tax Invoice (INV)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com
MS KATE PIGRAM		
- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1107354**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 61 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-APR-2011
Sampler	: LK	Issue Date	: 14-APR-2011
Order number	: 39540AUS		
		No. of samples received	: 14
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Quality Control Report contains the following information:

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

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*
		Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Sanjeshni Jyoti Mala	Senior Chemist Volatile	Sydney 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: 1742163)									
ES1107203-041	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	10.4	10.6	1.6	0% - 50%
ES1107203-056	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.4	10.2	30.8	0% - 50%
EA055: Moisture Content (QC Lot: 1742164)									
ES1107354-002	BH413_4.0-4.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	21.3	20.6	3.4	0% - 20%
ES1107464-004	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	7.7	6.3	20.0	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 1744801)									
ES1107280-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	21	26	24.2	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	114	109	4.6	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	70	93	28.3	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	36	42	13.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	202	177	13.3	0% - 20%
ES1107354-004	BH413_9.0-9.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	9	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	4	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	29	16	57.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	111	105	5.0	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	48	48	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1744802)									
ES1107280-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.1	0.4	94.4	No Limit
ES1107354-004	BH413_9.0-9.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1741815)									
ES1107337-001	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

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: 1741815) - continued									
ES1107337-001	Anonymous	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
ES1107354-001	BH413_1.1-1.3	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	1.3	2.1	46.8	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	12.8	11.2	13.3	0% - 20%
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	3.4	3.0	9.7	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	25.3	25.6	1.3	0% - 20%
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	26.1	26.8	2.4	0% - 20%
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	13.2	14.7	10.8	0% - 20%
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	12.4	13.0	4.4	0% - 20%
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	14.6	15.4	5.1	0% - 20%
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	4.9	7.8	46.6	0% - 50%
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	12.1	14.9	# 20.6	0% - 20%
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	4.6	5.3	14.2	0% - 50%
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.5	1.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.9	5.6	13.4	0% - 50%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1741814)									
ES1107337-001	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
ES1107354-001	BH413_1.1-1.3	EP071: C15 - C28 Fraction	----	100	mg/kg	520	440	16.3	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	380	370	4.3	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1742267)									
ES1107354-001	BH413_1.1-1.3	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1107441-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1741814)									
ES1107337-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1107354-001	BH413_1.1-1.3	EP071: >C16 - C34 Fraction	----	100	mg/kg	780	720	7.8	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	410	380	9.4	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1742267)									

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1742267) - continued									
ES1107354-001	BH413_1.1-1.3	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1107441-001	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 1742267)									
ES1107354-001	BH413_1.1-1.3	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: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1107441-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory 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: 1744579)									
ES1107349-008	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1107459-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1744576)									
ES1107189-006	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1107349-005	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	0.0005	0.0005	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1741154)									
ES1107200-001	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1741154) - continued									
ES1107200-001	Anonymous	EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1744367)									
ES1107256-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1107256-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	340	350	0.0	0% - 50%
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1741154)									
ES1107200-001	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1744367)									
ES1107256-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1107256-011	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	520	530	0.0	0% - 20%
EP080: BTEXN (QC Lot: 1744367)									
ES1107256-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1107256-011	Anonymous	EP080: Benzene	71-43-2	1	µg/L	142	142	0.0	0% - 20%
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	14	14	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	54	55	2.1	0% - 20%
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	21	22	9.1	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: 1744801)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	110	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	97.0	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	97.3	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	95.0	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	92.6	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	96.7	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	92.2	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1744802)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	95.1	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1741815)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	111	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	103	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	108	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	108	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	# 115	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	110	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	112	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	108	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	# 116	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	94.7	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	92.3	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	98.2	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	91.3	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	91.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	90.4	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1741814)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	91.0	75.2	116
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	106	75.3	113
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	94.3	72.6	117
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1742267)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1741814)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	100	75.2	116

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1741814) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	300 mg/kg	# 123	75.3	113
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	200 mg/kg	106	72.6	117
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1742267)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	105	68.4	128
EP080: BTEXN (QCLot: 1742267)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	89.2	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	88.2	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.5	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	101	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.4	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1744579)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.5	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	# 86.8	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	# 84.4	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	89.3	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.4	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.0	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.1	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1744576)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	94.6	86	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1741155)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	88.1	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	93.3	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	80.6	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	91.1	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	91.1	62.6	116
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1741155) - continued								
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	88.7	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	97.5	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	97.8	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	98.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	88.2	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	97.6	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	101	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	99.4	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	99.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	101	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	99.8	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1741154)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	200 µg/L	95.9	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	200 µg/L	122	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	200 µg/L	120	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744367)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	92.3	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1741154)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	250 µg/L	79.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	300 µg/L	116	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	150 µg/L	71.8	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744367)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	88.3	75	127
EP080: BTEXN (QCLot: 1744367)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	94.2	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	85.7	74.4	124
		5	µg/L	<5	----	----	----	----

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: BTEXN (QCLot: 1744367) - continued								
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	87.1	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	86.0	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	90.8	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	89.3	72.9	127

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: 1744801)							
ES1107280-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	91.0	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	96.4	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	114	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.7	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	78.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	107	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1744802)							
ES1107280-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	111	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1741815)							
ES1107337-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	110	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1741814)							
ES1107337-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	114	70	130
		EP071: C15 - C28 Fraction	----	3140 mg/kg	103	70	130
		EP071: C29 - C36 Fraction	----	2860 mg/kg	103	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1742267)							
ES1107354-001	BH413_1.1-1.3	EP080: C6 - C9 Fraction	----	32.5 mg/kg	80.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1741814)							
ES1107337-001	Anonymous	EP071: >C10 - C16 Fraction	----	1200 mg/kg	70.7	70	130
		EP071: >C16 - C34 Fraction	----	4600 mg/kg	117	70	130
		EP071: >C34 - C40 Fraction	----	2600 mg/kg	99.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1742267)							
ES1107354-001	BH413_1.1-1.3	EP080: C6 - C10 Fraction	----	37.5 mg/kg	83.5	70	130
EP080: BTEXN (QCLot: 1742267)							
ES1107354-001	BH413_1.1-1.3	EP080: Benzene	71-43-2	2.5 mg/kg	94.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	84.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	81.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	81.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.7	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.7	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report

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: 1744579)							
ES1107349-008	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	95.8	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	98.8	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	94.9	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	89.2	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	97.1	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	93.8	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	100	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1744576)							
ES1107189-006	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	78.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1741154)							
ES1107200-001	Anonymous	EP071: C10 - C14 Fraction	----	20 µg/L	119	70	130
		EP071: C15 - C28 Fraction	----	20 µg/L	128	70	130
		EP071: C29 - C36 Fraction	----	20 µg/L	122	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744367)							
ES1107256-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	86.9	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1741154)							
ES1107200-001	Anonymous	EP071: >C10 - C16 Fraction	----	50 µg/L	89.1	70	130
		EP071: >C16 - C34 Fraction	----	50 µg/L	99.0	70	130
		EP071: >C34 - C40 Fraction	----	20 µg/L	119	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744367)							
ES1107256-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	84.2	70	130
EP080: BTEXN (QCLot: 1744367)							
ES1107256-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	87.1	70	130
		EP080: Toluene	108-88-3	25 µg/L	89.9	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	87.5	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	83.4	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	91.9	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	77.5	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1107354**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 61 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 06-APR-2011
Sampler	: LK	Issue Date	: 14-APR-2011
Order number	: 39540AUS	No. of samples received	: 14
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **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								
BH413_1.1-1.3, BH413_6.0-6.15,	BH413_4.0-4.2, BH413_9.0-9.2	**01-APR-2011**	**----**	----	----	**08-APR-2011**	15-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH413_15.0-15.5, QC622	BH413_16.4-16.6,	**05-APR-2011**	**----**	----	----	**08-APR-2011**	19-APR-2011	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH413_1.1-1.3, BH413_6.0-6.15,	BH413_4.0-4.2, BH413_9.0-9.2	**01-APR-2011**	**12-APR-2011**	28-SEP-2011	✓	**12-APR-2011**	28-SEP-2011	✓
Soil Glass Jar - Unpreserved								
BH413_15.0-15.5, QC622	BH413_16.4-16.6,	**05-APR-2011**	**12-APR-2011**	02-OCT-2011	✓	**12-APR-2011**	02-OCT-2011	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH413_1.1-1.3, BH413_6.0-6.15,	BH413_4.0-4.2, BH413_9.0-9.2	**01-APR-2011**	**12-APR-2011**	29-APR-2011	✓	**13-APR-2011**	29-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH413_15.0-15.5, QC622	BH413_16.4-16.6,	**05-APR-2011**	**12-APR-2011**	03-MAY-2011	✓	**13-APR-2011**	03-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH413_1.1-1.3, BH413_6.0-6.15,	BH413_4.0-4.2, BH413_9.0-9.2	**01-APR-2011**	**08-APR-2011**	15-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH413_15.0-15.5, QC622	BH413_16.4-16.6,	**05-APR-2011**	**08-APR-2011**	19-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH413_1.1-1.3, BH413_6.0-6.15,	BH413_4.0-4.2, BH413_9.0-9.2	**01-APR-2011**	**08-APR-2011**	15-APR-2011	✓	**09-APR-2011**	15-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH413_15.0-15.5, QC622	BH413_16.4-16.6,	**05-APR-2011**	**08-APR-2011**	19-APR-2011	✓	**09-APR-2011**	19-APR-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 BH413_1.1-1.3, BH413_4.0-4.2, BH413_6.0-6.15, BH413_9.0-9.2	**01-APR-2011**	**08-APR-2011**	15-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Soil Glass Jar - Unpreserved BH413_15.0-15.5, BH413_16.4-16.6, QC622	**05-APR-2011**	**08-APR-2011**	19-APR-2011	✓	**09-APR-2011**	19-APR-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved BH413_1.1-1.3, BH413_4.0-4.2, BH413_6.0-6.15, BH413_9.0-9.2	**01-APR-2011**	**08-APR-2011**	15-APR-2011	✓	**09-APR-2011**	15-APR-2011	✓
Soil Glass Jar - Unpreserved BH413_15.0-15.5, BH413_16.4-16.6, QC622	**05-APR-2011**	**08-APR-2011**	19-APR-2011	✓	**09-APR-2011**	19-APR-2011	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved BH413_1.1-1.3, BH413_4.0-4.2, BH413_6.0-6.15, BH413_9.0-9.2	**01-APR-2011**	**08-APR-2011**	15-APR-2011	✓	**09-APR-2011**	15-APR-2011	✓
Soil Glass Jar - Unpreserved BH413_15.0-15.5, BH413_16.4-16.6, QC622	**05-APR-2011**	**08-APR-2011**	19-APR-2011	✓	**09-APR-2011**	19-APR-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 - Nitric Acid; Filtered QC621	**01-APR-2011**	---	28-SEP-2011	----	**12-APR-2011**	28-SEP-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC624	**05-APR-2011**	---	02-OCT-2011	----	**12-APR-2011**	02-OCT-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered QC621	**01-APR-2011**	---	29-APR-2011	----	**12-APR-2011**	29-APR-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC624	**05-APR-2011**	---	03-MAY-2011	----	**12-APR-2011**	03-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC621	**01-APR-2011**	**08-APR-2011**	08-APR-2011	✓	**11-APR-2011**	18-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC624	**05-APR-2011**	**08-APR-2011**	12-APR-2011	✓	**11-APR-2011**	18-MAY-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 QC621	**01-APR-2011**	**08-APR-2011**	08-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC624	**05-APR-2011**	**08-APR-2011**	12-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Amber VOC Vial - HCl QC621	**01-APR-2011**	**13-APR-2011**	15-APR-2011	✓	**13-APR-2011**	15-APR-2011	✓
Amber VOC Vial - HCl QC624	**05-APR-2011**	**13-APR-2011**	19-APR-2011	✓	**13-APR-2011**	19-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved QC621	**01-APR-2011**	**08-APR-2011**	08-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC624	**05-APR-2011**	**08-APR-2011**	12-APR-2011	✓	**09-APR-2011**	18-MAY-2011	✓
Amber VOC Vial - HCl QC621	**01-APR-2011**	**13-APR-2011**	15-APR-2011	✓	**13-APR-2011**	15-APR-2011	✓
Amber VOC Vial - HCl QC624	**05-APR-2011**	**13-APR-2011**	19-APR-2011	✓	**13-APR-2011**	19-APR-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl QC621	**01-APR-2011**	**13-APR-2011**	15-APR-2011	✓	**13-APR-2011**	15-APR-2011	✓
Amber VOC Vial - HCl QC624	**05-APR-2011**	**13-APR-2011**	19-APR-2011	✓	**13-APR-2011**	19-APR-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	4	39	**10.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	18	**11.1**	**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	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.6**	**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	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.6**	**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	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.6**	**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	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	13	**7.7**	**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	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	15	**13.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	**6.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	6	**16.7**	**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).
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)
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
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 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	ES1107354-001	BH413_1.1-1.3	**Benzo(a)pyrene**	50-32-8	20.6 %	0-20%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	2048889-009	----	**Phenanthrene**	85-01-8	115 %	79.4-114%	**Recovery greater than upper control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	2048889-009	----	**Chrysene**	218-01-9	116 %	79.8-114%	**Recovery greater than upper control limit**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	2048889-002	----	**>C16 - C34 Fraction**	----	123 %	75.3-113%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	2052623-043	----	**Cadmium**	7440-43-9	86.8 %	89-107%	**Recovery less than lower control limit**
EG020F: Dissolved Metals by ICP-MS	2052623-043	----	**Chromium**	7440-47-3	84.4 %	91-111%	**Recovery less than lower control limit**

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

CERTIFICATE OF ANALYSIS

Work Order	: **ES1107519**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 08-APR-2011
Sampler	: LK	Issue Date	: 18-APR-2011
Site	: ----		
		No. of samples received	: 20
Quote number	: EN/004/10	No. of samples analysed	: 11

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020: LCS recovery for Chromium falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH412_3.0-3.1	BH412_4.0-4.1	BH412_8.0-8.1	BH412_11.0-11.2	BH412_19.0-19.3
				Client sampling date / time: 06-APR-2011 15:00	06-APR-2011 15:00	06-APR-2011 15:00	06-APR-2011 15:00	07-APR-2011 15:00
				ES1107519-006	ES1107519-007	ES1107519-010	ES1107519-012	ES1107519-015
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	17.9	23.1	17.9	15.6	23.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	6	12	3	17
Copper	7440-50-8	5	mg/kg	31	<5	16	<5	8
Lead	7439-92-1	5	mg/kg	283	31	102	22	19
Nickel	7440-02-0	2	mg/kg	4	3	<2	<2	2
Zinc	7440-66-6	5	mg/kg	536	52	109	9	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	0.8	<0.5	1.0	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	1.4	0.5	3.4	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	1.4	0.6	4.0	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	0.7	<0.5	1.6	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	0.6	<0.5	1.3	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.6	<0.5	1.6	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.8	<0.5	1.6	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.7	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.9	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH412_3.0-3.1	BH412_4.0-4.1	BH412_8.0-8.1	BH412_11.0-11.2	BH412_19.0-19.3
				Client sampling date / time: 06-APR-2011 15:00	06-APR-2011 15:00	06-APR-2011 15:00	06-APR-2011 15:00	07-APR-2011 15:00
				ES1107519-006	ES1107519-007	ES1107519-010	ES1107519-012	ES1107519-015
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**84.0**	**81.0**	**103**	**102**	**80.9**
2-Chlorophenol-D4	93951-73-6	0.1	%	**95.0**	**83.6**	**91.0**	**86.4**	**80.3**
2.4.6-Tribromophenol	118-79-6	0.1	%	**84.7**	**89.2**	**84.6**	**85.2**	**82.1**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**95.2**	**92.8**	**91.5**	**91.6**	**89.5**
Anthracene-d10	1719-06-8	0.1	%	**97.7**	**93.7**	**94.1**	**94.8**	**96.1**
4-Terphenyl-d14	1718-51-0	0.1	%	**112**	**102**	**95.7**	**96.4**	**98.1**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**108**	**101**	**97.4**	**107**	**102**
Toluene-D8	2037-26-5	0.1	%	**115**	**109**	**117**	**122**	**111**
4-Bromofluorobenzene	460-00-4	0.1	%	**99.9**	**96.1**	**96.2**	**101**	**98.3**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	QC627	TRIPBLANK	BH412_22.0-22.2	----	----
				Client sampling date / time	07-APR-2011 15:00	06-APR-2011 15:00	08-APR-2011 15:00	----	----
					ES1107519-017	ES1107519-019	ES1107519-021	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		**24.0**	----	**13.9**	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	----
Chromium	7440-47-3	2	mg/kg		**16**	----	**8**	----	----
Copper	7440-50-8	5	mg/kg		**6**	----	<5	----	----
Lead	7439-92-1	5	mg/kg		**18**	----	<5	----	----
Nickel	7440-02-0	2	mg/kg		**3**	----	<2	----	----
Zinc	7440-66-6	5	mg/kg		**6**	----	<5	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	<0.1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		<10	<10	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	<10	<10	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: QC627	TRIPBLANK	BH412_22.0-22.2	----	----
				Client sampling date / time: 07-APR-2011 15:00	06-APR-2011 15:00	08-APR-2011 15:00	----	----
				ES1107519-017	ES1107519-019	ES1107519-021	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**86.8**	----	**96.7**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**82.7**	----	**84.5**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**75.9**	----	**84.0**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**89.5**	----	**92.0**	----	----
Anthracene-d10	1719-06-8	0.1	%	**95.0**	----	**97.3**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**99.0**	----	**102**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**100**	**115**	**114**	----	----
Toluene-D8	2037-26-5	0.1	%	**113**	**124**	**120**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**99.8**	**109**	**104**	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC625	QC626	QC629	----	----
				Client sampling date / time: 06-APR-2011 15:00	07-APR-2011 15:00	08-APR-2011 15:00	----	----
				ES1107519-001	ES1107519-002	ES1107519-003	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	**0.0001**	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	QC625	QC626	QC629	----	----
				Client sampling date / time	06-APR-2011 15:00	07-APR-2011 15:00	08-APR-2011 15:00	----	----
Compound	CAS Number	LOR	Unit		ES1107519-001	ES1107519-002	ES1107519-003	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued									
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<5	<5	<5	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		17.8	18.3	21.4	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		45.0	47.0	49.7	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		48.7	46.6	48.7	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		72.9	65.6	69.0	----	----
Anthracene-d10	1719-06-8	0.1	%		85.9	74.8	81.7	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		95.6	59.0	60.0	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		107	106	113	----	----
Toluene-D8	2037-26-5	0.1	%		105	99.0	108	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		120	117	102	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

15/4/11 page 1 of 3

Form:

AECOM

Chain of Custody & Analysis Request Form

COC #2

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 39546705

Sample collected by: Lauren Kovus **Sample Results to be returned to:** Anthony Davis / Kate McBrien

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Soil - 8 metals (TPH / BTEX) / TPH	HOLD	Water - 8 metals (TPH / BTEX) / TPH / PAH	Soil - TPH / BTEX	Remarks & comments
4	BH412_1-1-1.3	6-4-11		X					X		jar	X				Please contact Kate O'Brien for details of samples to be analysed.
5	BH412_2.0-2.2			X					X			X				
6	BH412_3.0-3.1			X					X			X				
7	BH412_4.0-4.1			X					X			X				
8	BH412_6.0-6.1			X					X			X				
9	BH412_7.0-7.2			X					X			X				
10	BH412_8.0-8.1			X					X			X				
11	BH412_10.0-10.1			X					X			X				
12	BH412_11.0-11.2			X					X			X				
13	BH412_14.0-14.1			X					X			X				

Subcon / Forward Lab / Split WO
Lab / Analysis: QCGS, MTG
Organised By / Date: Labmark
Relinquished By / Date:
Courier:
WO No:
Attach EDD / COC / Internal Sheet:

Relinquished By:	Received by:		
Name: Lauren Kovus Date: 8-4-11	Name: Sonja Kepa Date: 8/4/11	Received in good condition?	Yes/No/NA
of: AECOM Time: 12:45	of: AS Sydney Time: 15:20	Samples received chilled? 3.6°C	Yes/No/NA
Relinquished By:	**Received by:**	**Received in good condition?**	Yes/No/NA
Name: Date:	Name: Date:	**Samples received chilled?**	Yes/No/NA
of: Time:	of: Time:		Yes/No/NA

Method of Consignment No. Transport

Environmental Division
Sydney
Work Order
ES1107519

Telephone : +61-2-8784 8555

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~~Revision: Oct 09~~
BMS-PM-DV-F046

Environment

Form:

AECOM

Chain of Custody & Analysis Request Form

COC # 2

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARRINGTON2 **Project Number:** 60153531/61 **Purchase Order Number:** 39546405

Sample collected by: Lauren Kouros **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Soil - 2 to 2.5 m (8 March 11 / 8784)	Soil - 1 to 1.5 m (8 March 11 / 8784)	HOLD	Soil - 1 to 1.5 m (8 March 11 / 8784)	Soil - 1 to 1.5 m (8 March 11 / 8784)	Soil - 1 to 1.5 m (8 March 11 / 8784)	Remarks & comments
14	BH412_18.0-18.1	7-4-11		X					X		Jar			X				Please contact Kate O'Brien for details of samples for analysis
15	BH412_19.0-19.3	"		X					X		↓			X				
16	BH412_20.0-20.2	8-4-11		X					X					X				
17	QC627	7-4-11		X					X					X				
18	QC628	7-4-11		X					X					X				
19	TRIPBLANK	6-4-11		X					X					X				
1	QC625	6-4-11			X				X		2V, 1A, 1P	X	X	X				
2	QC626	7-4-11			X				X		↓			X	X	X	X	
3	QC629	8-4-11			X				X					X	X	X	X	
BH									[illegible]									

Relinquished By:
Name: Lauren Kouros Date: 8-4-11
of: AECOM Time: 12:45

Received by:
Name: Sophie Date: 8/4/11
of: Pesstow Time: 1520

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA — 3.6°C
Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Form:

page 3 of 3

AECOM

Chain of Custody & Analysis Request Form

COC # 2 /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.C.Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6-1 **Purchase Order Number:** 3954067105

Sample collected by: **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Remarks & comments
20	BH412_21.0-21.2	8.4.11		X					X			see note page 1 and 2.
21	BH412_22.0-22.2	"		X					X			

Soil - 5-26 8 metals (inc Hg) / BTEX / PAH — HFS — Water - 14, 26 TPH / BTEX / PAH / 8 metals — Soil - TPH / BTEX

Metals: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn

Relinquished By:	Received by:			
Name: Lauren Kovus	Name: Sonya Hayes	Received in good condition?	Yes/No/NA	Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Date: 8.4.11	Date: 8/4/11	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: AECOM	of: ALS	3.6°C	Yes/No/NA	Transport Co:
Time: 12:45	Time: 15:20			

Relinquished By:	Received by:			
Name:	Name:	Received in good condition?	Yes/No/NA	Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Date:	Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.
of:	of:		Yes/No/NA	Transport Co:
Time:	Time:			

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Wael Saleh

From: McGrath, Kate [Kate.O'Brien@aecom.com]
Sent: Monday, 11 April 2011 11:20 AM
To: Wael Saleh
Subject: RE: Barangaroo - Samples taken 6/4/11 - 8/4/11

Hi Wael,

Could I please get the following samples analysed for 8 Metals, TPH, BTEX and PAHs

BH412_3.0-3.1
BH412_4.0-4.1
BH412_8.0-8.1
BH412_11.0-11.2
BH412_19-19.3
BH412_22.0-22.2
QC627
TRIPBLANK – please analyse for just TPH C_6-C_9 and BTEX

Could you please send QC628 to MGT Labmark for analysis for 8 Metals, TPH, BTEX and PAHs

Regards,

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072
PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

Please consider the environment before printing this email.

.-. -.. -
From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Monday, April 11, 2011 10:30 AM
To: McGrath, Kate
Subject: Barangaroo - Samples taken 6/4/11 - 8/4/11
Importance: High

Hi Kate,

Please confirm this is the only analysis you require.

Kind regards

How was your customer experience? Please send us your feedback

Wael Saleh
Creation/Committal Coordinator

ALS Environmental

277 Woodpark Road
Smithfield, NSW, 2164

Direct: +61 2 8784 8513
Phone: +61 2 8784 8555
Fax: +61 2 8784 8500
Email: wael.saleh@alsglobal.com

****
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****

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ALS Group: Click here to report this email as spam.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1107519**		
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0384 (EN/004/10)
Site	: ----		
Sampler	: LK	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 08-APR-2011	Issue Date	: 20-APR-2011 15:51
Client Requested Due Date	: 02-MAY-2011	Scheduled Reporting Date	: **02-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.6'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 20
Security Seal	: Intact.	No. of samples analysed	: 12

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **All analysis added on 20/04/11 Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **Sample QC628 will be forwarded to MGT Labmark.**
- **Additional analysis added on Sample #7, 8, 10, 15 and 21 on 20/04/11.**
- **Holding times for Di Leach analysis is 14 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EK055G Ammonia as N By Discrete Analyser	SOIL - EK055-SD Ammonia in Sediments by Steam Distillation	SOIL - EP071(SV-TPH-WD) Total Petroleum Hydrocarbons (TPH)	SOIL - S-18 (NO MOIST) TPH(C6-C9)/BTEX with No Moisture for TBs	SOIL - S-24 TPH/BTEX/PAH + Phenols	SOIL - S-26 8 metals/TPH/BTEX/PAH	SOIL - UTO-5W Ultratrace PAH/Phenols
ES1107519-004	06-APR-2011 15:00	BH412_1.1-1.3	✓							
ES1107519-005	06-APR-2011 15:00	BH412_2.0-2.2	✓							
ES1107519-006	06-APR-2011 15:00	BH412_3.0-3.1							✓	
ES1107519-007	06-APR-2011 15:00	BH412_4.0-4.1		✓	✓	✓			✓	✓
ES1107519-008	06-APR-2011 15:00	BH412_6.0-6.1		✓	✓	✓		✓		✓
ES1107519-009	06-APR-2011 15:00	BH412_7.0-7.2	✓							
ES1107519-010	06-APR-2011 15:00	BH412_8.0-8.1		✓	✓	✓			✓	✓
ES1107519-011	06-APR-2011 15:00	BH412_10.0-10.1	✓							
ES1107519-012	06-APR-2011 15:00	BH412_11.0-11.2							✓	
ES1107519-013	06-APR-2011 15:00	BH412_14.0-14.1	✓							
ES1107519-014	07-APR-2011 15:00	BH412_18.0-18.1	✓							
ES1107519-015	07-APR-2011 15:00	BH412_19.0-19.3		✓	✓	✓			✓	✓
ES1107519-016	08-APR-2011 15:00	BH412_20.0-20.2	✓							
ES1107519-017	07-APR-2011 15:00	QC627							✓	
ES1107519-019	06-APR-2011 15:00	TRIPBLANK					✓			
ES1107519-020	08-APR-2011 15:00	BH412_21.0-21.2	✓							
ES1107519-021	08-APR-2011 15:00	BH412_22.0-22.2		✓	✓	✓			✓	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1107519-001	06-APR-2011 15:00	QC625	✓
ES1107519-002	07-APR-2011 15:00	QC626	✓
ES1107519-003	08-APR-2011 15:00	QC629	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS KATE MCGRATH

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1107519**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-APR-2011
Sampler	: LK	Issue Date	: 18-APR-2011
Order number	: 39540AUS		
		No. of samples received	: 20
Quote number	: EN/004/10	No. of samples analysed	: 11

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*
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Raymond Commodor	Instrument Chemist	Sydney Inorganics

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: 1745020)									
ES1107514-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	17.2	16.9	1.8	0% - 50%
ES1107514-012	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.0	12.8	1.8	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1747664)									
ES1107462-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	3	2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	5	2	82.8	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	27	20	28.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	1460	1470	1.1	0% - 20%
ES1107732-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	37	36	2.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	11	11	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	12	12	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	9	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	36	36	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1747665)									
ES1107462-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1744821)									
ES1107408-001	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

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: 1744821) - continued									
ES1107408-001	Anonymous	EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1107519-012	BH412_11.0-11.2	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	<0.5	<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: 1744754)									
ES1107519-006	BH412_3.0-3.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1744820)									
ES1107408-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	560	630	11.8	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	110	9.5	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	180	210	15.7	No Limit
ES1107519-012	BH412_11.0-11.2	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1744754)									
ES1107519-006	BH412_3.0-3.1	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1744820)									
ES1107408-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	570	610	6.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	280	280	0.0	No Limit
ES1107519-012	BH412_11.0-11.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 1744754)									
ES1107519-006	BH412_3.0-3.1	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

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: BTEXN (QC Lot: 1744754) - continued									
ES1107519-006	BH412_3.0-3.1	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory 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: 1746715)									
ES1107519-003	QC629	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1107580-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1746714)									
ES1107519-001	QC625	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1107685-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1745158)									
ES1107227-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	20	20	0.0	No Limit
ES1107461-006	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1745158)									
ES1107227-003	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	70	60	15.8	No Limit
ES1107461-006	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1745158)									
ES1107227-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	4	4	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	7	7	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	6	6	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1107461-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 1745158) - continued									
ES1107461-006	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control 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: 1747664)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	124	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	102	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	107	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	104	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	101	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	114	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	103	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1747665)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	83.7	67	118
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1744821)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	109	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	111	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	108	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	110	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	110	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	108	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	110	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	97.7	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	104	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	78.5	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	104	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	102	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	97.8	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	99.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	95.8	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744754)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	108	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744820)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	104	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	200 mg/kg	98.0	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	92.9	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744754)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	104	68.4	128

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744820)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	86.6	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	300 mg/kg	115	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	200 mg/kg	108	63	131
EP080: BTEXN (QCLot: 1744754)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	108	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.9	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.4	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	102	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.7	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	108	63	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1746715)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.5	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	90.3	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.1	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	88.6	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.0	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	89.3	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.9	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1746714)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	98.4	86	116
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1744974)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	68.0	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	78.0	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	72.0	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	78.0	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	84.0	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	82.0	64.3	116
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1744974) - continued								
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	94.0	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	94.0	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	84.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	84.0	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	80.0	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	100	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	90.3	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	88.0	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	86.0	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	86.0	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744977)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	79.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	80.0	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	77.5	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1745158)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	101	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744977)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	250 µg/L	65.6	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	300 µg/L	102	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	200 µg/L	104	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1745158)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	87.6	75	127
EP080: BTEXN (QCLot: 1745158)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	94.5	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	89.1	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	103	70	120

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: BTEXN (QCLot: 1745158) - continued								
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	104	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	100	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	90.2	72.9	127

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: 1747664)							
ES1107462-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	103	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	96.8	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	# Not Determined	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1747665)							
ES1107462-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	87.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1744821)							
ES1107408-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	90.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744754)							
ES1107519-006	BH412_3.0-3.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	79.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1744820)							
ES1107408-001	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	89.0	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	94.5	53	125
		EP071: C29 - C36 Fraction	----	2860 mg/kg	94.3	52	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744754)							
ES1107519-006	BH412_3.0-3.1	EP080: C6 - C10 Fraction	----	37.5 mg/kg	81.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1744820)							
ES1107408-001	Anonymous	EP071: >C10 - C16 Fraction	----	1200 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	4600 mg/kg	71.8	53	125
		EP071: >C34 - C40 Fraction	----	1700 mg/kg	125	52	126
EP080: BTEXN (QCLot: 1744754)							
ES1107519-006	BH412_3.0-3.1	EP080: Benzene	71-43-2	2.5 mg/kg	94.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	90.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	97.5	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.1	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report

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: 1746715)							
ES1107531-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	99.6	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	98.4	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	89.4	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	99.8	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	97.3	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	101	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1746714)							
ES1107519-002	QC626	EG035F: Mercury	7439-97-6	0.0100 mg/L	101	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1745158)							
ES1107227-003	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	81.1	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1745158)							
ES1107227-003	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	79.0	70	130
EP080: BTEXN (QCLot: 1745158)							
ES1107227-003	Anonymous	EP080: Benzene	71-43-2	25 µg/L	82.3	70	130
		EP080: Toluene	108-88-3	25 µg/L	94.0	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.8	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	88.2	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	87.3	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1107519**	Page	: 1 of 10
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 08-APR-2011
Sampler	: LK	Issue Date	: 18-APR-2011
Order number	: 39540AUS	No. of samples received	: 20
Quote number	: EN/004/10	No. of samples analysed	: 11

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								
BH412_3.0-3.1,	BH412_4.0-4.1,	**06-APR-2011**	**----**	----	----	**12-APR-2011**	20-APR-2011	✓
BH412_8.0-8.1,	BH412_11.0-11.2							
Soil Glass Jar - Unpreserved								
BH412_19.0-19.3,	QC627	**07-APR-2011**	**----**	----	----	**12-APR-2011**	21-APR-2011	✓
Soil Glass Jar - Unpreserved								
BH412_22.0-22.2		**08-APR-2011**	**----**	----	----	**12-APR-2011**	22-APR-2011	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH412_3.0-3.1,	BH412_4.0-4.1,	**06-APR-2011**	**13-APR-2011**	03-OCT-2011	✓	**14-APR-2011**	03-OCT-2011	✓
BH412_8.0-8.1,	BH412_11.0-11.2							
Soil Glass Jar - Unpreserved								
BH412_19.0-19.3,	QC627	**07-APR-2011**	**13-APR-2011**	04-OCT-2011	✓	**14-APR-2011**	04-OCT-2011	✓
Soil Glass Jar - Unpreserved								
BH412_22.0-22.2		**08-APR-2011**	**13-APR-2011**	05-OCT-2011	✓	**14-APR-2011**	05-OCT-2011	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH412_3.0-3.1,	BH412_4.0-4.1,	**06-APR-2011**	**13-APR-2011**	04-MAY-2011	✓	**14-APR-2011**	04-MAY-2011	✓
BH412_8.0-8.1,	BH412_11.0-11.2							
Soil Glass Jar - Unpreserved								
BH412_19.0-19.3,	QC627	**07-APR-2011**	**13-APR-2011**	05-MAY-2011	✓	**14-APR-2011**	05-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH412_22.0-22.2		**08-APR-2011**	**13-APR-2011**	06-MAY-2011	✓	**14-APR-2011**	06-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved								
BH412_3.0-3.1,	BH412_4.0-4.1,	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
BH412_8.0-8.1,	BH412_11.0-11.2							
Soil Glass Jar - Unpreserved								
BH412_19.0-19.3,	QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH412_22.0-22.2		**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-MAY-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 BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2, TRIPBLANK	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**15-APR-2011**	20-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**15-APR-2011**	21-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**15-APR-2011**	22-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Soil Glass Jar - Unpreserved BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2, TRIPBLANK	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**15-APR-2011**	20-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**15-APR-2011**	21-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-MAY-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**15-APR-2011**	22-APR-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2, TRIPBLANK	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**15-APR-2011**	20-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**15-APR-2011**	21-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**15-APR-2011**	22-APR-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: BTEXN							
Soil Glass Jar - Unpreserved BH412_3.0-3.1, BH412_4.0-4.1, BH412_8.0-8.1, BH412_11.0-11.2, TRIPBLANK	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**15-APR-2011**	20-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_19.0-19.3, QC627	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**15-APR-2011**	21-APR-2011	✓
Soil Glass Jar - Unpreserved BH412_22.0-22.2	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**15-APR-2011**	22-APR-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 - Nitric Acid; Filtered QC625	**06-APR-2011**	**---**	03-OCT-2011	----	**13-APR-2011**	03-OCT-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC626	**07-APR-2011**	**---**	04-OCT-2011	----	**13-APR-2011**	04-OCT-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC629	**08-APR-2011**	**---**	05-OCT-2011	----	**13-APR-2011**	05-OCT-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered QC625	**06-APR-2011**	**---**	04-MAY-2011	----	**15-APR-2011**	04-MAY-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC626	**07-APR-2011**	**---**	05-MAY-2011	----	**15-APR-2011**	05-MAY-2011	✓
Clear Plastic Bottle - Nitric Acid; Filtered QC629	**08-APR-2011**	**---**	06-MAY-2011	----	**15-APR-2011**	06-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC625	**06-APR-2011**	**12-APR-2011**	13-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC626	**07-APR-2011**	**12-APR-2011**	14-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC629	**08-APR-2011**	**12-APR-2011**	15-APR-2011	✓	**13-APR-2011**	22-MAY-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 QC625	**06-APR-2011**	**12-APR-2011**	13-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC626	**07-APR-2011**	**12-APR-2011**	14-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC629	**08-APR-2011**	**12-APR-2011**	15-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber VOC Vial - HCl QC625	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	20-APR-2011	✓
Amber VOC Vial - HCl QC626	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	21-APR-2011	✓
Amber VOC Vial - HCl QC629	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved QC625	**06-APR-2011**	**12-APR-2011**	13-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC626	**07-APR-2011**	**12-APR-2011**	14-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC629	**08-APR-2011**	**12-APR-2011**	15-APR-2011	✓	**13-APR-2011**	22-MAY-2011	✓
Amber VOC Vial - HCl QC625	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	20-APR-2011	✓
Amber VOC Vial - HCl QC626	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	21-APR-2011	✓
Amber VOC Vial - HCl QC629	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-APR-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl QC625	**06-APR-2011**	**12-APR-2011**	20-APR-2011	✓	**12-APR-2011**	20-APR-2011	✓
Amber VOC Vial - HCl QC626	**07-APR-2011**	**12-APR-2011**	21-APR-2011	✓	**12-APR-2011**	21-APR-2011	✓
Amber VOC Vial - HCl QC629	**08-APR-2011**	**12-APR-2011**	22-APR-2011	✓	**12-APR-2011**	22-APR-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	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	**11.1**	**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	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	**11.1**	**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	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	**11.1**	**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	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	**11.1**	**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	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**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)							
Dissolved Mercury by FIMS	EG035F	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**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)
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions

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.
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 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							
EG005T: Total Metals by ICP-AES	ES1107462-003	Anonymous	**Zinc**	7440-66-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1108140**	Page	: 1 of 19
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 14-APR-2011
Sampler	: DS	Issue Date	: 29-APR-2011
Site	: ----		
		No. of samples received	: 25
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG020: LCS recovery for Chromium falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: DI WATER LEACHATE				Client sample ID	BH411_3.1-3.2	BH411_10.0-10.1	BH411_19.0-19.1	BH411_23.0-23.1	----
				Client sampling date / time	21-APR-2011 12:00	21-APR-2011 12:00	21-APR-2011 12:00	21-APR-2011 12:00	----
Compound	CAS Number	LOR	Unit		ES1108140-006	ES1108140-011	ES1108140-015	ES1108140-019	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.04**	**0.02**	**0.15**	**0.35**	----
EP080/071: Total Petroleum Hydrocarbons									
C10 - C14 Fraction	----	50	µg/L		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L		<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L		<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
>C10 - C16 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	<100	<100	<100	----
EP132A: Phenolic Compounds									
2-Chlorophenol	95-57-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
m-Cresol	108-39-4	0.1	µg/L		**0.4**	**0.2**	**0.5**	**0.2**	----
o-Cresol	95-48-7	0.1	µg/L		**0.1**	<0.1	<0.1	<0.1	----
p-Cresol	106-44-5	0.1	µg/L		**0.1**	<0.1	**0.1**	<0.1	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L		**0.2**	<0.1	<0.1	<0.1	----
Hexachlorophene	70-30-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2-Nitrophenol	88-75-5	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
4-Nitrophenol	100-02-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Pentachlorophenol	87-86-5	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
Phenol	108-95-2	0.1	µg/L		**0.7**	<0.1	**0.5**	<0.1	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		**0.4**	<0.1	<0.1	<0.1	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Acenaphthene	83-32-9	0.1	µg/L		**0.1**	<0.1	<0.1	<0.1	----
Acenaphthylene	208-96-8	0.1	µg/L		**0.2**	<0.1	<0.1	<0.1	----
Anthracene	120-12-7	0.1	µg/L		**0.2**	**0.2**	<0.1	<0.1	----
Benz(a)anthracene	56-55-3	0.1	µg/L		**0.2**	<0.1	<0.1	<0.1	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		**0.06**	<0.05	<0.05	<0.05	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_3.1-3.2	BH411_10.0-10.1	BH411_19.0-19.1	BH411_23.0-23.1	----
				Client sampling date / time: 21-APR-2011 12:00	21-APR-2011 12:00	21-APR-2011 12:00	21-APR-2011 12:00	----
				ES1108140-006	ES1108140-011	ES1108140-015	ES1108140-019	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Chrysene	218-01-9	0.1	µg/L	**0.1**	<0.1	<0.1	<0.1	----
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Fluoranthene	206-44-0	0.1	µg/L	**0.5**	**0.5**	<0.1	<0.1	----
Fluorene	86-73-7	0.1	µg/L	**0.3**	**0.2**	<0.1	<0.1	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Naphthalene	91-20-3	0.1	µg/L	**1.4**	**0.2**	**0.4**	**0.3**	----
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Phenanthrene	85-01-8	0.1	µg/L	**1.1**	**1.1**	<0.1	**0.1**	----
Pyrene	129-00-0	0.1	µg/L	**0.4**	**0.4**	<0.1	<0.1	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**75.4**	**50.6**	**66.1**	**59.2**	----
Phenol-d6	13127-88-3	0.1	%	**55.0**	**39.4**	**46.5**	**38.1**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**111**	**97.7**	**96.7**	**107**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**99.5**	**90.9**	**72.9**	**93.8**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**107**	**105**	**77.0**	**109**	----
Anthracene-d10	1719-06-8	0.1	%	**108**	**94.2**	**78.5**	**92.4**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**111**	**94.3**	**79.6**	**92.6**	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_2.0-2.1	BH411_3.1-3.2	BH411_4.0-4.1	BH411_8.0-8.1	BH411_10.0-10.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-005	ES1108140-006	ES1108140-007	ES1108140-010	ES1108140-011
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	19.8	20.5	19.4	20.3	18.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	<5	5	----
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	----
Chromium	7440-47-3	2	mg/kg	11	----	5	23	----
Copper	7440-50-8	5	mg/kg	14	----	160	32	----
Lead	7439-92-1	5	mg/kg	135	----	70	150	----
Nickel	7440-02-0	2	mg/kg	24	----	27	18	----
Zinc	7440-66-6	5	mg/kg	83	----	402	222	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.4	----	0.2	0.2	----
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	<1	----	----	<1
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	----	11.0	----	----	9.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	0.7	----	1.3	2.0	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	0.6	0.6	----
Fluoranthene	206-44-0	0.5	mg/kg	1.3	----	2.4	1.8	----
Pyrene	129-00-0	0.5	mg/kg	1.2	----	2.3	1.7	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	0.7	----	1.1	0.7	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	0.8	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.6	----	1.0	0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	0.6	----	0.9	0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_2.0-2.1	BH411_3.1-3.2	BH411_4.0-4.1	BH411_8.0-8.1	BH411_10.0-10.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-005	ES1108140-006	ES1108140-007	ES1108140-010	ES1108140-011
EP080/071: Total Petroleum Hydrocarbons - Continued								
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	----	<10	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	----	<10	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	<1	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/kg	----	<10	----	----	<10
4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	----	<10	----	----	<10
m-Cresol	108-39-4	10	µg/kg	----	<10	----	----	**20**
o-Cresol	95-48-7	10	µg/kg	----	<10	----	----	<10
p-Cresol	106-44-5	10	µg/kg	----	<10	----	----	**10**
2.4-Dichlorophenol	120-83-2	10	µg/kg	----	<10	----	----	<10
2.6-Dichlorophenol	87-65-0	10	µg/kg	----	<10	----	----	<10
2.4-Dimethylphenol	105-67-9	10	µg/kg	----	<10	----	----	**10**
Hexachlorophene	70-30-4	10	µg/kg	----	<10	----	----	<10
2-Nitrophenol	88-75-5	10	µg/kg	----	<10	----	----	<10
4-Nitrophenol	100-02-7	10	µg/kg	----	<10	----	----	<10
Pentachlorophenol	87-86-5	10	µg/kg	----	<10	----	----	<10
Phenol	108-95-2	10	µg/kg	----	<10	----	----	**20**
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	----	<10	----	----	<10
2.4.5-Trichlorophenol	95-95-4	10	µg/kg	----	<10	----	----	<10
2.4.6-Trichlorophenol	88-06-2	10	µg/kg	----	<10	----	----	<10
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/kg	----	<10	----	----	<10

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_2.0-2.1	BH411_3.1-3.2	BH411_4.0-4.1	BH411_8.0-8.1	BH411_10.0-10.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-005	ES1108140-006	ES1108140-007	ES1108140-010	ES1108140-011
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
2-Methylnaphthalene	91-57-6	10	µg/kg	----	10	----	----	80
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	----	<10	----	----	<10
Acenaphthene	83-32-9	10	µg/kg	----	10	----	----	60
Acenaphthylene	208-96-8	10	µg/kg	----	90	----	----	340
Anthracene	120-12-7	10	µg/kg	----	120	----	----	620
Benz(a)anthracene	56-55-3	10	µg/kg	----	460	----	----	970
Benzo(a)pyrene	50-32-8	10	µg/kg	----	480	----	----	700
Benzo(b)fluoranthene	205-99-2	10	µg/kg	----	440	----	----	620
Benzo(e)pyrene	192-97-2	10	µg/kg	----	280	----	----	400
Benzo(g.h.i)perylene	191-24-2	10	µg/kg	----	140	----	----	150
Benzo(k)fluoranthene	207-08-9	10	µg/kg	----	260	----	----	440
Chrysene	218-01-9	10	µg/kg	----	420	----	----	790
Coronene	191-07-1	10	µg/kg	----	20	----	----	20
Dibenz(a.h)anthracene	53-70-3	10	µg/kg	----	60	----	----	90
Fluoranthene	206-44-0	10	µg/kg	----	750	----	----	2110
Fluorene	86-73-7	10	µg/kg	----	20	----	----	350
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	----	130	----	----	170
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	----	<100	----	----	<100
Naphthalene	91-20-3	10	µg/kg	----	30	----	----	60
Perylene	198-55-0	10	µg/kg	----	120	----	----	170
Phenanthrene	85-01-8	10	µg/kg	----	420	----	----	2180
Pyrene	129-00-0	10	µg/kg	----	790	----	----	1900
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	84.4	----	92.1	91.2	----
2-Chlorophenol-D4	93951-73-6	0.1	%	83.5	----	93.1	93.1	----
2.4.6-Tribromophenol	118-79-6	0.1	%	76.5	----	88.3	94.6	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	92.5	----	96.5	97.0	----
Anthracene-d10	1719-06-8	0.1	%	97.1	----	99.9	100	----
4-Terphenyl-d14	1718-51-0	0.1	%	106	----	112	114	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	85.0	----	88.1	77.7	----
Toluene-D8	2037-26-5	0.1	%	78.3	----	81.1	90.4	----
4-Bromofluorobenzene	460-00-4	0.1	%	84.1	----	82.9	107	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	----	83.9	----	----	69.3
Phenol-d6	13127-88-3	0.1	%	----	80.4	----	----	63.2
2-Chlorophenol-D4	93951-73-6	0.1	%	----	88.1	----	----	77.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_2.0-2.1	BH411_3.1-3.2	BH411_4.0-4.1	BH411_8.0-8.1	BH411_10.0-10.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-005	ES1108140-006	ES1108140-007	ES1108140-010	ES1108140-011
EP132S: Acid Extractable Surrogates - Continued								
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**87.6**	----	----	**86.1**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	**91.2**	----	----	**87.1**
Anthracene-d10	1719-06-8	0.1	%	----	**106**	----	----	**90.9**
4-Terphenyl-d14	1718-51-0	0.1	%	----	**112**	----	----	**110**

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_15.0-15.1	BH411_18.0-18.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_26.0-26.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-012	ES1108140-014	ES1108140-015	ES1108140-019	ES1108140-022
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**27.8**	**34.6**	**22.3**	**15.4**	**16.0**
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	**24**	----	----	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	<1
Chromium	7440-47-3	2	mg/kg	**10**	**40**	----	----	**2**
Copper	7440-50-8	5	mg/kg	**47**	**118**	----	----	**6**
Lead	7439-92-1	5	mg/kg	**257**	**366**	----	----	<5
Nickel	7440-02-0	2	mg/kg	**8**	**12**	----	----	<2
Zinc	7440-66-6	5	mg/kg	**198**	**446**	----	----	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	**0.9**	**3.4**	----	----	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	1	mg/kg	----	----	**8**	<1	----
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	----	----	**5.8**	**5.6**	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	**1.2**	----	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	**3.4**	----	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	**0.5**	----	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	**1.2**	----	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	**5.4**	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	**3.3**	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	**1.0**	**17.0**	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	**0.9**	**17.7**	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	**7.3**	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	**5.6**	----	----	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	**5.9**	----	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	**1.9**	----	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	**6.8**	----	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	**2.2**	----	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	**2.7**	----	----	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	**930**	**1130**	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	**380**	**820**	<100	<100	<100

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH411_15.0-15.1	BH411_18.0-18.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_26.0-26.1
				Client sampling date / time	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
					ES1108140-012	ES1108140-014	ES1108140-015	ES1108140-019	ES1108140-022
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**1310**	**1950**	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		<10	<10	----	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	<10	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**1210**	**1610**	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		**120**	**680**	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**1330**	**2290**	<50	<50	<50
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
EP080: BTEXN									
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	<1
EP132A: Phenolic Compounds									
2-Chlorophenol	95-57-8	10	µg/kg		----	----	<10	<10	----
4-Chloro-3-Methylphenol	59-50-7	10	µg/kg		----	----	<10	<10	----
m-Cresol	108-39-4	10	µg/kg		----	----	<10	<10	----
o-Cresol	95-48-7	10	µg/kg		----	----	<10	<10	----
p-Cresol	106-44-5	10	µg/kg		----	----	<10	<10	----
2.4-Dichlorophenol	120-83-2	10	µg/kg		----	----	<10	<10	----
2.6-Dichlorophenol	87-65-0	10	µg/kg		----	----	<10	<10	----
2.4-Dimethylphenol	105-67-9	10	µg/kg		----	----	<10	<10	----
Hexachlorophene	70-30-4	10	µg/kg		----	----	<10	<10	----
2-Nitrophenol	88-75-5	10	µg/kg		----	----	<10	<10	----
4-Nitrophenol	100-02-7	10	µg/kg		----	----	<10	<10	----
Pentachlorophenol	87-86-5	10	µg/kg		----	----	<10	<10	----
Phenol	108-95-2	10	µg/kg		----	----	<10	<10	----
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg		----	----	<10	<10	----
2.4.5-Trichlorophenol	95-95-4	10	µg/kg		----	----	<10	<10	----
2.4.6-Trichlorophenol	88-06-2	10	µg/kg		----	----	<10	<10	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	10	µg/kg		----	----	<10	<10	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_15.0-15.1	BH411_18.0-18.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_26.0-26.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-012	ES1108140-014	ES1108140-015	ES1108140-019	ES1108140-022
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
2-Methylnaphthalene	91-57-6	10	µg/kg	----	----	<10	<10	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	----	----	<10	<10	----
Acenaphthene	83-32-9	10	µg/kg	----	----	<10	<10	----
Acenaphthylene	208-96-8	10	µg/kg	----	----	<10	<10	----
Anthracene	120-12-7	10	µg/kg	----	----	<10	<10	----
Benz(a)anthracene	56-55-3	10	µg/kg	----	----	<10	<10	----
Benzo(a)pyrene	50-32-8	10	µg/kg	----	----	<10	<10	----
Benzo(b)fluoranthene	205-99-2	10	µg/kg	----	----	<10	<10	----
Benzo(e)pyrene	192-97-2	10	µg/kg	----	----	<10	<10	----
Benzo(g.h.i)perylene	191-24-2	10	µg/kg	----	----	<10	<10	----
Benzo(k)fluoranthene	207-08-9	10	µg/kg	----	----	<10	<10	----
Chrysene	218-01-9	10	µg/kg	----	----	<10	<10	----
Coronene	191-07-1	10	µg/kg	----	----	<10	<10	----
Dibenz(a.h)anthracene	53-70-3	10	µg/kg	----	----	<10	<10	----
Fluoranthene	206-44-0	10	µg/kg	----	----	<10	<10	----
Fluorene	86-73-7	10	µg/kg	----	----	<10	<10	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	----	----	<10	<10	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	----	----	<100	<100	----
Naphthalene	91-20-3	10	µg/kg	----	----	<10	<10	----
Perylene	198-55-0	10	µg/kg	----	----	<10	<10	----
Phenanthrene	85-01-8	10	µg/kg	----	----	<10	<10	----
Pyrene	129-00-0	10	µg/kg	----	----	**10**	<10	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**92.7**	**89.5**	----	----	**87.9**
2-Chlorophenol-D4	93951-73-6	0.1	%	**95.5**	**94.3**	----	----	**89.5**
2.4.6-Tribromophenol	118-79-6	0.1	%	**98.2**	**96.1**	----	----	**91.2**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**100**	**96.9**	----	----	**96.7**
Anthracene-d10	1719-06-8	0.1	%	**102**	**99.6**	----	----	**100**
4-Terphenyl-d14	1718-51-0	0.1	%	**116**	**106**	----	----	**115**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**89.2**	**80.8**	----	----	**89.1**
Toluene-D8	2037-26-5	0.1	%	**79.3**	**79.1**	----	----	**78.9**
4-Bromofluorobenzene	460-00-4	0.1	%	**82.4**	**81.1**	----	----	**83.3**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	----	----	**85.3**	**53.7**	----
Phenol-d6	13127-88-3	0.1	%	----	----	**90.0**	**58.1**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	**79.8**	**62.9**	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH411_15.0-15.1	BH411_18.0-18.1	BH411_19.0-19.1	BH411_23.0-23.1	BH411_26.0-26.1
				Client sampling date / time: 12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00	12-APR-2011 15:00
				ES1108140-012	ES1108140-014	ES1108140-015	ES1108140-019	ES1108140-022
EP132S: Acid Extractable Surrogates - Continued								
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	**98.2**	**74.9**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	**95.7**	**66.2**	----
Anthracene-d10	1719-06-8	0.1	%	----	----	**97.3**	**79.2**	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	**106**	**89.7**	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	QC632	----	----	----	----
				Client sampling date / time	13-APR-2011 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1108140-024	----	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		33.1	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		13	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		27	----	----	----	----
Copper	7440-50-8	5	mg/kg		77	----	----	----	----
Lead	7439-92-1	5	mg/kg		333	----	----	----	----
Nickel	7440-02-0	2	mg/kg		9	----	----	----	----
Zinc	7440-66-6	5	mg/kg		316	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		1.6	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		1.1	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		3.3	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		1.2	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		5.4	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		3.2	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		17.0	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		17.7	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		7.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		5.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		6.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		3.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		6.8	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		2.2	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		2.7	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		1130	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		760	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		1890	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: QC632	----	----	----	----
				Client sampling date / time: 13-APR-2011 15:00	----	----	----	----
				ES1108140-024	**----**	**----**	**----**	**----**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	**1580**	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	**580**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	**2160**	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**87.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**90.5**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**98.5**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**95.1**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**102**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**108**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**80.3**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**90.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC630	QC633	QC635	----	----
				Client sampling date / time: 12-APR-2011 15:00	13-APR-2011 15:00	14-APR-2011 15:00	----	----
				ES1108140-001	ES1108140-002	ES1108140-003	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC630	QC633	QC635	----	----
				Client sampling date / time: 12-APR-2011 15:00	13-APR-2011 15:00	14-APR-2011 15:00	----	----
				ES1108140-001	ES1108140-002	ES1108140-003	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<5	<5	<5	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**15.6**	**15.2**	**14.4**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**40.5**	**39.3**	**35.3**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**55.3**	**50.9**	**50.2**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**58.2**	**52.9**	**58.3**	----	----
Anthracene-d10	1719-06-8	0.1	%	**63.0**	**60.1**	**59.3**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**49.2**	**49.1**	**47.3**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**123**	**127**	**116**	----	----
Toluene-D8	2037-26-5	0.1	%	**106**	**106**	**105**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**112**	**113**	**109**	----	----

Surrogate Control Limits

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates - Continued			
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Form:

AECOM

Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531/61 **Purchase Order Number:** 391546 HNS

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McIntosh

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____ days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Soil 1-2d 8 metals/TPH/BTEX/PAH	HOLD	WATER 1-2d TPH/BTEX/PAH/8 metals	Soil 1 PAH/BTEX	Remarks & comments
(4)	BH4 1_1.0-1.1	12.4.11		x					x		Jar		x			Please contact Kate O'Brien for details of samples to be analysed.
(5)	BH4 1_2.0-2.1			x					x		↓	✓	x			
(6)	BH4 1_3.1-3.2			x					x			✓	x			
(7)	BH4 1_4.0-4.1			x					x				x	→ See attachment		
(8)	BH4 1_5.0-5.1			x					x			✓	x			
(9)	BH4 1_7.0-7.1			x					x				x			
(10)	BH4 1_8.0-8.1			x					x				x			
(11)	BH4 1_10.0-10.1			x					x			✓	x			
(12)	BH4 1_15.0-15.1			x					x				x	→ See attachment		
(13)	BH4 1_16.0-16.1			x					x			✓	x			
													x			

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of
Name: Dirk Sanderson Date: 14.4.11	Name: Sonya Steffe Date: 14-4-11	Samples received chilled? 3.6c	Yes/No/NA	Consignm No.
of: AECOM Time: 15:00	of: ALS Sydney Time: 1600		Yes/No/NA	Transport
Relinquished By:	**Received by:**	**Received in good condition?**	Yes/No/NA	**Method of**
Name: Date:	Name: Date:	**Samples received chilled?**	Yes/No/NA	**Consignm No.**
of: Time:	of: Time:		Yes/No/NA	**Transport Co:**

Environmental Division Sydney
Work Order
ES1108140

Telephone : +61-2-8784 8555

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Environment

Revision: Oct 09
BMS-PM-DV-F046

Form:

AECOM

Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.OBrien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6 1 **Purchase Order Number:** 30154CAUS

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Soil - 5-24	8 metals/TPH/BTEX	PAH	HELD	Metals - 1A, 2A	TPH/BTEX/PAH/Cr6	Cr6	Soil - TPH/BTEX	Remarks & comments
(14)	BH411_18.0-18.1			X					X		Jar		✓	✓	X					Metals As, Cd, Cu, Cr, Ni, Pb, Hg, Zn
(15)	BH411_19.0-19.1			X					X						X → see attached					
(16)	BH411_20.0-20.1			X					X						X					Please contact Kate O'Brien for details of samples to be analysed.
(17)	BH411_21.0-21.1			X					X						X					
(18)	BH411_22.0-22.1			X					X						X					
(19)	BH411_23.0-23.1			X					X						X → see attached					
(20)	BH411_24.0-24.1			X					X						X					
(21)	BH411_25.0-25.1			X					X						X					
(22)	BH411_26.0-26.1			X					X						X					
(23)	QC631			X					X				✓	✓	X					

Relinquished By:	Received by:		
Name: Dirk Sanderson	Name: Scott Heffer	Date: 14/4/11	Received in good condition? (Yes)/No/NA
of: AECOM	of: AES	Time: 15:00 / 1600	Samples received chilled? 3.6 (Yes)/No/NA
			Yes/No/NA
Method of Shipment	☐ Courier ☐ Postal ☐ By Hand		
Consignment Note No.			
Transport Co:			

Relinquished By:	Received by:		
Name:	Name:	Date:	Received in good condition? Yes/No/NA
of:	of:	Time:	Samples received chilled? Yes/No/NA
			Yes/No/NA
Method of Shipment	☐ Courier ☐ Postal ☐ By Hand		
Consignment Note No.			
Transport Co:			

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Form:

AECOM

Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 39540AUS

Sample collected by: **Sample Results to be returned to:** Anthony Davis / Kate McBeath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: SOIL - 6 - 26	Analysis Request: 8 metals (filtered)	Analysis Request: TBT	Analysis Request: HOLD	Analysis Request: WATER - 14 - 26	Analysis Request: TBT (BTEX / PAH / P)	Analysis Request: HOLD	Analysis Request: SOIL - TBT (BTEX / PAH / P)	Remarks & comments
24	QC632	13.4.11		x					x		Jar		✓		x					Please contact Kate O'Brien for details of samples to be analysed.
25	QC634	14.4.11		x					x		Jar				x					
1	QC630	12.4.11			x				x		2V, 1A, 1P				x			x	x	
2	QC633	13.4.11			x				x		↓				x			x	x	
3	QC635	14.4.11			x				x		↓				x			x	x	

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 14.4.11	Name: Sophie Date: 14/4/11	Samples received chilled? 3.6	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 15:00	of: AECOM Time: 16:00		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	**Received in good condition?**	Yes/No/NA	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: Date:	**Samples received chilled?**	Yes/No/NA	**Consignment Note No.**	
of: Time:	of: Time:		Yes/No/NA	**Transport Co:**	

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Environment

Jacob Waugh

From: Glenyss Weeks
Sent: Tuesday, 19 April 2011 1:00 PM
To: Jacob Waugh
Subject: RE: Analysis Request _ Barangaroo COC - 14 Apr 2011
Attachments: RE: ES1107519

Alright. This is sorted as per the email attached.

Please analyse:

6 BH411_3.1-3.2

~~7 BH411_4.0-4.1~~

11 BH411_10-10.1

15 BH411_19-19.1

19 BH411_23-23.1

For:

PAHs (low mwt) — Ultra Trace PAH.

Phenols and cresols — Ultra Trace Phenols

TPH C10-~~32~~ 36

Ammonia

As well as ASLP leach for: (DI Water)

PAHs (low mwt) — ultra Trace

Phenols and cresols — ultra Trace

TPH C10-~~32~~ 36

Ammonia

Make sense? I'll come swing by.
g

How was your customer experience? Please send us your feedback

Glenyss Weeks
Senior Project Manager

ALS Environmental Division

Address

277-289 Woodpark Road, Smithfield, NSW, 2164

DIRECT +61 2 8784 8515
PHONE +61 2 8784 8555
FAX +61 2 8784 8500

www.alsglobal.com

P Please consider the environment before printing this email

From: Jacob Waugh
Sent: Monday, 18 April 2011 5:32 PM
To: Glenyss Weeks
Subject: RE: Analysis Request _ Barangaroo COC - 14 Apr 2011

Hi Glenyss,

I have the paperwork for this batch (ES1108140) on my desk so when you're ready to sort this out please come and see me.

Jacob Waugh
LABORATORY CO-ORDINATOR

ALS | Environmental

Address
277 Woodpark Road, Smithfield, NSW, 2164

PHONE +61 2 8784 8555
FAX +61 2 8784 8500

www.alsglobal.com

Please consider the environment before printing this email.

From: Glenyss Weeks
Sent: Monday, 18 April 2011 5:24 PM
To: McGrath, Kate
Cc: Jennifer Cullen; Smith, Garry (Sydney); Davis, Anthony; Jacob Waugh
Subject: RE: Analysis Request _ Barangaroo COC - 14 Apr 2011

Hi Kate,

I'll take care of this for you in Jenn's absence as Jacob has actually taken on a new role in the Lab.

Thanks,
Glenyss

How was your customer experience? Please send us your feedback

Glenyss Weeks
Senior Project Manager

ALS | Environmental Division

Address
277-289 Woodpark Road, Smithfield, NSW, 2164

DIRECT +61 2 8784 8515
PHONE +61 2 8784 8555
FAX +61 2 8784 8500

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P Please consider the environment before printing this email

From: McGrath, Kate [mailto:Kate.O'Brien@aecom.com]
Sent: Monday, 18 April 2011 5:12 PM
To: Jacob Waugh
Cc: Jennifer Cullen; Glenyss Weeks; Smith, Garry (Sydney); Davis, Anthony
Subject: Analysis Request _ Barangaroo COC - 14 Apr 2011

Hi Jacob

Could I please get the following analysis

8 Metals, TPH, BTEX and PAHs in these Soil samples

5 BH411_2.0-2.1
7 BH411_4.0-4.1
10 BH411_8.0-8.1
12 BH411_15.0-15.1
14 BH411_18.0-18.1
22 BH411_26.0-2.1
24 QC632

Both **Soil and ASLP** (Ultratrace – please use lowest LOR where available) analysis for:

PAHs (low mwt)

Phenols and cresols

TPH fractions

BTEX

Ammonia

Dibenzofuran

Styrene

2-methylnaphthalene

Cyanide

In the following samples

BH411_3.1-3.2

BH411_4.0-4.1

BH411_10-10.1

BH411_19-19.1

BH411_23-23.1

Note for the **B** (Soil and ASLP) analysis, where there is not enough sample, the list of analytes are from highest to lowest priority.

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072
PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

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.-. -.. -

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Glenyss Weeks

From: McGrath, Kate <Kate.O'Brien@aecom.com>
Sent: Tuesday, 19 April 2011 3:18 PM
To: Glenyss Weeks
Cc: Jennifer Cullen; Davis, Anthony; Jacob Waugh; Smith, Garry (Sydney)
Subject: RE: ES1108140 RE: Analysis Request _ Barangaroo COC - 14 Apr 2011

Hi Glenyss,

Please just do the 'A' analysis for sample BH411_4.0-4.1. (ie just the TPH/BTEX/PAH & 8 metals)

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
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PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

Please consider the environment before printing this email.

.-. -.. -
From: Glenyss Weeks [mailto:Glenyss.Weeks@ALSGlobal.com]
Sent: Tuesday, April 19, 2011 2:46 PM
To: McGrath, Kate
Cc: Jennifer Cullen; Davis, Anthony; Jacob Waugh; Smith, Garry (Sydney)
Subject: ES1108140 RE: Analysis Request _ Barangaroo COC - 14 Apr 2011
Importance: High

Hi Kate,

We've run into a bit of an issue with the requested analysis for ES1108140. I'm hoping this email will clarify some things with regards to your requests as well as what we can achieve with the minimal sample volumes received.

From the tables below you can see that sample BH411_4.0-4.1 (ES1108140-007) has been requested for suite 16 (S-16) as well as the "B" analysis of Soil and ASLP.

"A" analysis 8 metals/PAH/TPH/BTEX (S-16) MINIMUM required volumes

	AECOM ID	BH411_2.0-2.1	BH411_4.0-4.1	BH411_8.0-8.1	BH411_15.0-15.1	BH411_18.0-18.1	BH411_26.0-26.1	QC632
	ALS ID	ES1108140-005	ES1108140-007	ES1108140-010	ES1108140-012	ES1108140-014	ES1108140-022	ES1108140-024
Soil Samples	**TPH(C6-C9)/BTEX**	**5g**	**5g**	**5g**	**5g**	**5g**	**5g**	**5g**
	TPH(C10-	**10g**	**10g**	**10g**	**10g**	**10g**	**10g**	**10g**

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1108140**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0384 (EN/004/10)
Site	: ----		
Sampler	: DS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 14-APR-2011	Issue Date	: 20-APR-2011 14:38
Client Requested Due Date	: 29-APR-2011	Scheduled Reporting Date	: **29-APR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 3.6'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 25
Security Seal	: Intact.	No. of samples analysed	: 14

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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		
QC630	- Clear Plastic Bottle - Nitric Acid; Unspecified	- Clear Plastic Bottle - Nitric Acid; Filtered
QC633	- Clear Plastic Bottle - Nitric Acid; Unspecified	- Clear Plastic Bottle - Nitric Acid; Filtered
QC635	- Clear Plastic Bottle - Nitric Acid; Unspecified	- Clear Plastic Bottle - Nitric Acid; Filtered
EG035F : Dissolved Mercury by FIMS		
QC630	- Clear Plastic Bottle - Nitric Acid; Unspecified	- Clear Plastic Bottle - Nitric Acid; Filtered
QC633	- Clear Plastic Bottle - Nitric Acid; Unspecified	- Clear Plastic Bottle - Nitric Acid; Filtered
QC635	- Clear Plastic Bottle - Nitric Acid; Unspecified	- 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 - EK055G Ammonia as N By Discrete Analyser	SOIL - EK055-SD Ammonia in Sediments by Steam Distillation	SOIL - EP071-(SV) TPH(SV) Standard Limits of Reporting	SOIL - EP071(SV-TPH-WD) Total Petroleum Hydrocarbons (TPH)	SOIL - S-26 8 metals/TPH/BTEX/PAH	SOIL - UTO-5S Ultratrace PAH/Phenols	SOIL - UTO-5W Ultratrace PAH/Phenols
ES1108140-004	12-APR-2011 15:00	BH411_1.0-1.1	✓							
ES1108140-005	12-APR-2011 15:00	BH411_2.0-2.1						✓		
ES1108140-006	12-APR-2011 15:00	BH411_3.1-3.2		✓	✓	✓	✓		✓	✓
ES1108140-007	12-APR-2011 15:00	BH411_4.0-4.1						✓		
ES1108140-008	12-APR-2011 15:00	BH411_5.0-5.1	✓							
ES1108140-009	12-APR-2011 15:00	BH411_7.0-7.1	✓							
ES1108140-010	12-APR-2011 15:00	BH411_8.0-8.1						✓		
ES1108140-011	12-APR-2011 15:00	BH411_10.0-10.1		✓	✓	✓	✓		✓	✓
ES1108140-012	12-APR-2011 15:00	BH411_15.0-15.1						✓		
ES1108140-013	12-APR-2011 15:00	BH411_16.0-16.1	✓							
ES1108140-014	12-APR-2011 15:00	BH411_18.0-18.1						✓		
ES1108140-015	12-APR-2011 15:00	BH411_19.0-19.1		✓	✓	✓	✓		✓	✓
ES1108140-016	12-APR-2011 15:00	BH411_20.0-20.1	✓							
ES1108140-017	12-APR-2011 15:00	BH411_21.0-21.1	✓							
ES1108140-018	12-APR-2011 15:00	BH411_22.0-22.1	✓							
ES1108140-019	12-APR-2011 15:00	BH411_23.0-23.1		✓	✓	✓	✓		✓	✓
ES1108140-020	12-APR-2011 15:00	BH411_24.0-24.1	✓							
ES1108140-021	12-APR-2011 15:00	BH411_25.0-25.1	✓							
ES1108140-022	12-APR-2011 15:00	BH411_26.0-26.1						✓		
ES1108140-023	12-APR-2011 15:00	QC631	✓							
ES1108140-024	13-APR-2011 15:00	QC632						✓		
ES1108140-025	14-APR-2011 15:00	QC634	✓							

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1108140-001	12-APR-2011 15:00	QC630	✓
ES1108140-002	13-APR-2011 15:00	QC633	✓
ES1108140-003	14-APR-2011 15:00	QC635	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice	Email	anthony.davis@aecom.com
- Chain of Custody (CoC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG	Email	anthony.davis@aecom.com
- EDI Format - ESDAT	Email	anthony.davis@aecom.com
- EDI Format - HLAPro	Email	anthony.davis@aecom.com
- EDI Format - XTab	Email	anthony.davis@aecom.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- A4 - AU Tax Invoice (INV)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1108140**	Page	: 1 of 16
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-APR-2011
Sampler	: DS	Issue Date	: 29-APR-2011
Order number	: 39540AUS		
		No. of samples received	: 25
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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: 1757294)									
ES1108124-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	21.0	22.0	4.8	0% - 20%
ES1108140-011	BH411_10.0-10.1	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	18.4	17.8	3.5	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1757031)									
ES1108106-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	49	45	7.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	75	76	1.6	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	112	112	0.0	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	10	10	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	54	54	0.0	0% - 50%
ES1108113-002	Anonymous	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	<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	15	17	17.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	20	6.2	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1757032)									
ES1108106-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1108113-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK055: Ammonia as N (QC Lot: 1766456)									
ES1107519-007	Anonymous	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	2	2	0.0	No Limit
ES1108140-006	BH411_3.1-3.2	EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1757085)									
ES1108121-012	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

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: 1757085) - continued									
ES1108121-012	Anonymous	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
ES1108140-007	BH411_4.0-4.1	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	1.3	1.7	23.4	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	0.6	0.7	15.9	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	2.4	2.7	11.1	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	2.3	2.6	10.3	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	1.1	1.2	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	0.8	0.8	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.0	1.0	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	0.9	0.9	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: 1756673)									
ES1108140-005	BH411_2.0-2.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1108214-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1757084)									
ES1108121-012	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
ES1108140-007	BH411_4.0-4.1	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 Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1756673)									
ES1108140-005	BH411_2.0-2.1	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1108214-004	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1757084)									
ES1108121-012	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1108140-007	BH411_4.0-4.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	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: 1757084) - continued									
ES1108140-007	BH411_4.0-4.1	EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 1756673)									
ES1108140-005	BH411_2.0-2.1	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
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1108214-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP132A: Phenolic Compounds (QC Lot: 1757640)									
ES1108140-015	BH411_19.0-19.1	EP132: 2-Chlorophenol	95-57-8	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<10	<10	0.0	No Limit
		EP132: m-Cresol	108-39-4	10	µg/kg	<10	<10	0.0	No Limit
		EP132: o-Cresol	95-48-7	10	µg/kg	<10	<10	0.0	No Limit
		EP132: p-Cresol	106-44-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.4-Dichlorophenol	120-83-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.6-Dichlorophenol	87-65-0	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.4-Dimethylphenol	105-67-9	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Hexachlorophene	70-30-4	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2-Nitrophenol	88-75-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 4-Nitrophenol	100-02-7	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Pentachlorophenol	87-86-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Phenol	108-95-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<10	<10	0.0	No Limit
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1757640)									
ES1108140-015	BH411_19.0-19.1	EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	<10	0.0	No Limit
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Acenaphthene	83-32-9	10	µg/kg	<10	<10	0.0	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 (%)
EP132B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1757640) - continued									
ES1108140-015	BH411_19.0-19.1	EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Anthracene	120-12-7	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Chrysene	218-01-9	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Coronene	191-07-1	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Fluoranthene	206-44-0	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Fluorene	86-73-7	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Naphthalene	91-20-3	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Perylene	198-55-0	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Phenanthrene	85-01-8	10	µg/kg	<10	<10	0.0	No Limit
		EP132: Pyrene	129-00-0	10	µg/kg	10	<10	0.0	No Limit
		EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	<100	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: 1757027)									
ES1108140-003	QC635	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1108268-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.033	0.034	0.0	0% - 20%
		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	31.6	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.521	0.516	1.0	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 1757026)									
ES1108140-001	QC630	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1108146-008	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1762914)									
ES1108140-006	BH411_3.1-3.2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.04	0.0	No Limit
ES1108492-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	3.34	3.28	1.7	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1760062)									
EM1103927-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1108098-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1760062)									
EM1103927-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1108098-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1760062)									
EM1103927-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1108098-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	5	5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control 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: 1757031)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	121	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	104	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	107	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	105	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	99.4	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	109	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	104	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1757032)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	81.4	67	118
EK055: Ammonia as N (QCLot: 1766456)								
EK055-SD: Ammonia as N	7664-41-7	1	mg/kg	<1	20 mg/kg	116	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757085)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	89.3	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	93.5	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	85.4	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	82.8	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	89.6	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	88.8	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	95.6	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	98.5	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	88.5	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	89.4	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	82.6	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	86.8	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	93.2	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	82.9	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	85.7	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	87.5	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1756673)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	105	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1757084)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	99.0	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	250 mg/kg	126	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.0	63	131

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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1756673)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	94.1	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1757084)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	102	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	98.3	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	107	63	131
EP080: BTEXN (QCLot: 1756673)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	84.1	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	81.8	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	81.2	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	80.5	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	81.6	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	82.9	63	131
EP132A: Phenolic Compounds (QCLot: 1757640)								
EP132: 2-Chlorophenol	95-57-8	10	µg/kg	<10	100 µg/kg	101	56.2	115
EP132: 4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<10	100 µg/kg	98.0	60.1	121
EP132: m-Cresol	108-39-4	10	µg/kg	<10	100 µg/kg	103	44.7	119
EP132: o-Cresol	95-48-7	10	µg/kg	<10	100 µg/kg	90.2	32.6	98
EP132: p-Cresol	106-44-5	10	µg/kg	<10	100 µg/kg	94.1	39.1	99.9
EP132: 2.4-Dichlorophenol	120-83-2	10	µg/kg	<10	100 µg/kg	93.9	38.1	115
EP132: 2.6-Dichlorophenol	87-65-0	10	µg/kg	<10	100 µg/kg	97.5	52.1	116
EP132: 2.4-Dimethylphenol	105-67-9	10	µg/kg	<10	100 µg/kg	30.1	19.7	83.1
EP132: Hexachlorophene	70-30-4	10	µg/kg	<10	100 µg/kg	56.5	9.02	80
EP132: 2-Nitrophenol	88-75-5	10	µg/kg	<10	100 µg/kg	82.9	26.8	121
EP132: 4-Nitrophenol	100-02-7	10	µg/kg	<10	100 µg/kg	86.4	36.1	116
EP132: Pentachlorophenol	87-86-5	10	µg/kg	<10	100 µg/kg	# 82.1	32.4	81.6
EP132: Phenol	108-95-2	10	µg/kg	<10	100 µg/kg	97.8	48.2	129
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<10	100 µg/kg	# 95.4	30.4	92.8
EP132: 2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<10	100 µg/kg	# 111	47.3	111
EP132: 2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<10	100 µg/kg	102	31.2	107
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757640)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	113	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	104	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	91.4	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	115	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	103	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	116	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	121	65.7	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
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757640) - continued								
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	110	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	104	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	112	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	107	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	110	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	123	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	101	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	115	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	114	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	118	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	113	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	100 µg/kg	107	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	101	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	118	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	112	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	113	67.9	127

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: 1757027)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.4	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.5	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	# 88.2	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.5	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.1	90	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.8	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.2	85	115
EG035F: Dissolved Mercury by FIMS (QCLot: 1757026)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	94.5	86	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1762914)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	102	79.6	122
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1756741)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	71.0	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	85.7	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	74.4	62.2	113
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1756741) - continued								
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	84.5	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	88.2	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	88.9	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	104	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	98.1	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	94.7	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	99.3	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	89.0	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	99.4	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	97.2	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	99.4	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	96.3	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	99.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1756740)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	64.7	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	109	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	83.8	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1760062)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	112	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1761473)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	67.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	93.8	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	94.6	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1756740)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	68.2	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	91.1	73.9	138

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 Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1756740) - continued								
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	120	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1760062)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	112	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1761473)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	74.4	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	79.4	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	95.8	62.7	131
EP080: BTEXN (QCLot: 1760062)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	96.2	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	96.0	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.3	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	92.7	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	92.9	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	96.2	72.9	127
EP132A: Phenolic Compounds (QCLot: 1762396)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	109	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	105	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	80.2	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	85.6	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	79.2	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	96.6	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	105	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	105	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	63.2	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	84.1	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	84.9	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	36.5	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	52.8	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	92.4	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	109	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	110	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1762396)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	104	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	112	67.7	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1762396) - continued								
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	104	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	102	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	104	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	106	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	108	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	101	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	93.6	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	97.0	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	103	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	98.1	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	104	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	102	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	104	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	110	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	111	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	104	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	116	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	102	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	110	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	104	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	109	75.1	117

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: 1757031)							
ES1108106-021	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	87.7	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	103	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	107	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1757032)							
ES1108106-021	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	88.1	70	130
EK055: Ammonia as N (QCLot: 1766456)							
ES1107519-010	Anonymous	EK055-SD: Ammonia as N	7664-41-7	20 mg/kg	99.5	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757085)							
ES1108121-012	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	82.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1756673)							
ES1108140-005	BH411_2.0-2.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	88.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1757084)							
ES1108121-012	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	82.8	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	84.7	53	125
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.3	52	126
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1756673)							
ES1108140-005	BH411_2.0-2.1	EP080: C6 - C10 Fraction	----	37.5 mg/kg	89.0	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1757084)							
ES1108121-012	Anonymous	EP071: >C10 - C16 Fraction	----	820 mg/kg	93.9	73	137
		EP071: >C16 - C34 Fraction	----	4600 mg/kg	82.8	53	125
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	98.2	52	126
EP080: BTEXN (QCLot: 1756673)							
ES1108140-005	BH411_2.0-2.1	EP080: Benzene	71-43-2	2.5 mg/kg	78.5	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	89.3	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	97.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	96.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.6	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
EP080: BTEXN (QCLot: 1756673) - continued							
ES1108140-005	BH411_2.0-2.1	EP080: Naphthalene	91-20-3	2.5 mg/kg	92.7	70	130
EP132A: Phenolic Compounds (QCLot: 1757640)							
ES1108140-015	BH411_19.0-19.1	EP132: 2-Chlorophenol	95-57-8	100 µg/kg	106	23	130
		EP132: 4-Chloro-3-Methylphenol	59-50-7	100 µg/kg	113	42	125
		EP132: m-Cresol	108-39-4	100 µg/kg	110	25	123
		EP132: o-Cresol	95-48-7	100 µg/kg	99.6	25	121
		EP132: p-Cresol	106-44-5	100 µg/kg	114	12	137
		EP132: 2.4-Dichlorophenol	120-83-2	100 µg/kg	114	25	124
		EP132: 2.6-Dichlorophenol	87-65-0	100 µg/kg	113	33	126
		EP132: 2.4-Dimethylphenol	105-67-9	100 µg/kg	105	0	127
		EP132: Hexachlorophene	70-30-4	100 µg/kg	81.3	10	138
		EP132: 2-Nitrophenol	88-75-5	100 µg/kg	81.7	17	165
		EP132: 4-Nitrophenol	100-02-7	100 µg/kg	98.0	31	146
		EP132: Pentachlorophenol	87-86-5	100 µg/kg	103	28	121
		EP132: Phenol	108-95-2	100 µg/kg	97.8	0	142
		EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	100 µg/kg	102	21	114
		EP132: 2.4.5-Trichlorophenol	95-95-4	100 µg/kg	106	32	119
		EP132: 2.4.6-Trichlorophenol	88-06-2	100 µg/kg	111	30	122
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757640)							
ES1108140-015	BH411_19.0-19.1	EP132: 3-Methylcholanthrene	56-49-5	100 µg/kg	111	21	129
		EP132: 2-Methylnaphthalene	91-57-6	100 µg/kg	111	40	130
		EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	100 µg/kg	78.4	8	158
		EP132: Acenaphthene	83-32-9	100 µg/kg	106	38	127
		EP132: Acenaphthylene	208-96-8	100 µg/kg	104	35	122
		EP132: Anthracene	120-12-7	100 µg/kg	106	44	124
		EP132: Benz(a)anthracene	56-55-3	100 µg/kg	103	48	124
		EP132: Benzo(a)pyrene	50-32-8	100 µg/kg	102	44	123
		EP132: Benzo(b)fluoranthene	205-99-2	100 µg/kg	106	43	129
		EP132: Benzo(e)pyrene	192-97-2	100 µg/kg	86.1	46	130
		EP132: Benzo(g.h.i)perylene	191-24-2	100 µg/kg	80.1	43	129
		EP132: Benzo(k)fluoranthene	207-08-9	100 µg/kg	93.7	54	123
		EP132: Chrysene	218-01-9	100 µg/kg	94.5	55	122
		EP132: Coronene	191-07-1	100 µg/kg	53.7	33	134
		EP132: Dibenz(a.h)anthracene	53-70-3	100 µg/kg	93.1	46	129
		EP132: Fluoranthene	206-44-0	100 µg/kg	92.6	52	125
		EP132: Fluorene	86-73-7	100 µg/kg	111	45	121
		EP132: Indeno(1.2.3.cd)pyrene	193-39-5	100 µg/kg	81.4	41	132
		EP132: N-2-Fluorenyl Acetamide	53-96-3	100 µg/kg	106	28	152

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
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1757640) - continued							
ES1108140-015	BH411_19.0-19.1	EP132: Naphthalene	91-20-3	100 µg/kg	107	34	130
		EP132: Perylene	198-55-0	100 µg/kg	104	38	124
		EP132: Phenanthrene	85-01-8	100 µg/kg	104	45	124
		EP132: Pyrene	129-00-0	100 µg/kg	94.5	51	129

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: 1757027)							
ES1108146-001	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	100	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	96.3	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	87.2	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	86.5	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	89.4	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	90.6	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	93.1	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1757026)							
ES1108140-002	QC633	EG035F: Mercury	7439-97-6	0.0100 mg/L	95.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1762914)							
ES1108140-006	BH411_3.1-3.2	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1760062)							
EM1103927-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	128	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1760062)							
EM1103927-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	124	70	130
EP080: BTEXN (QCLot: 1760062)							
EM1103927-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.0	70	130
		EP080: Toluene	108-88-3	25 µg/L	104	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	99.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	96.8	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	97.6	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	101	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1108140**	Page	: 1 of 11
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 14-APR-2011
Sampler	: DS	Issue Date	: 29-APR-2011
Order number	: 39540AUS		
		No. of samples received	: 25
Quote number	: SY/418/10 V2	No. of samples analysed	: 14

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								
BH411_2.0-2.1,	BH411_3.1-3.2,	**12-APR-2011**	**----**	----	----	**20-APR-2011**	26-APR-2011	✓
BH411_4.0-4.1,	BH411_8.0-8.1,							
BH411_10.0-10.1,	BH411_15.0-15.1,							
BH411_18.0-18.1,	BH411_19.0-19.1,							
BH411_23.0-23.1,	BH411_26.0-26.1							
Soil Glass Jar - Unpreserved								
QC632		**13-APR-2011**	**----**	----	----	**20-APR-2011**	27-APR-2011	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH411_2.0-2.1,	BH411_4.0-4.1,	**12-APR-2011**	**20-APR-2011**	09-OCT-2011	✓	**20-APR-2011**	09-OCT-2011	✓
BH411_8.0-8.1,	BH411_15.0-15.1,							
BH411_18.0-18.1,	BH411_26.0-26.1							
Soil Glass Jar - Unpreserved								
QC632		**13-APR-2011**	**20-APR-2011**	10-OCT-2011	✓	**20-APR-2011**	10-OCT-2011	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH411_2.0-2.1,	BH411_4.0-4.1,	**12-APR-2011**	**20-APR-2011**	10-MAY-2011	✓	**27-APR-2011**	10-MAY-2011	✓
BH411_8.0-8.1,	BH411_15.0-15.1,							
BH411_18.0-18.1,	BH411_26.0-26.1							
Soil Glass Jar - Unpreserved								
QC632		**13-APR-2011**	**20-APR-2011**	11-MAY-2011	✓	**27-APR-2011**	11-MAY-2011	✓
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved								
BH411_3.1-3.2,	BH411_10.0-10.1,	**12-APR-2011**	**----**	----	----	**29-APR-2011**	09-OCT-2011	✓
BH411_19.0-19.1,	BH411_23.0-23.1							
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
BH411_3.1-3.2,	BH411_10.0-10.1,	**21-APR-2011**	**---**	19-MAY-2011	----	**27-APR-2011**	19-MAY-2011	✓
BH411_19.0-19.1,	BH411_23.0-23.1							

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
EN60: Bottle Leaching Procedure							
LabSplit: Leach for organics and other tests							
BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**12-APR-2011**	---	26-APR-2011	----	**21-APR-2011**	26-APR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_4.0-4.1, BH411_8.0-8.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_26.0-26.1	**12-APR-2011**	**20-APR-2011**	26-APR-2011	✓	**21-APR-2011**	30-MAY-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**20-APR-2011**	27-APR-2011	✓	**21-APR-2011**	30-MAY-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**21-APR-2011**	**26-APR-2011**	28-APR-2011	✓	**27-APR-2011**	05-JUN-2011	✓
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_4.0-4.1, BH411_8.0-8.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_26.0-26.1	**12-APR-2011**	**19-APR-2011**	26-APR-2011	✓	**24-APR-2011**	26-APR-2011	✓
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_3.1-3.2, BH411_4.0-4.1, BH411_8.0-8.1, BH411_10.0-10.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_19.0-19.1, BH411_23.0-23.1, BH411_26.0-26.1	**12-APR-2011**	**20-APR-2011**	26-APR-2011	✓	**20-APR-2011**	30-MAY-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**19-APR-2011**	27-APR-2011	✓	**24-APR-2011**	27-APR-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**20-APR-2011**	27-APR-2011	✓	**20-APR-2011**	30-MAY-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							
Amber Glass Bottle - Unpreserved							
BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**21-APR-2011**	**26-APR-2011**	28-APR-2011	✓	**27-APR-2011**	05-JUN-2011	✓
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_4.0-4.1, BH411_8.0-8.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_26.0-26.1	**12-APR-2011**	**19-APR-2011**	26-APR-2011	✓	**24-APR-2011**	26-APR-2011	✓
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_3.1-3.2, BH411_4.0-4.1, BH411_8.0-8.1, BH411_10.0-10.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_19.0-19.1, BH411_23.0-23.1, BH411_26.0-26.1	**12-APR-2011**	**20-APR-2011**	26-APR-2011	✓	**20-APR-2011**	30-MAY-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**19-APR-2011**	27-APR-2011	✓	**24-APR-2011**	27-APR-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**20-APR-2011**	27-APR-2011	✓	**20-APR-2011**	30-MAY-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_4.0-4.1, BH411_8.0-8.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_26.0-26.1	**12-APR-2011**	**19-APR-2011**	26-APR-2011	✓	**24-APR-2011**	26-APR-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**19-APR-2011**	27-APR-2011	✓	**24-APR-2011**	27-APR-2011	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved							
BH411_2.0-2.1, BH411_4.0-4.1, BH411_8.0-8.1, BH411_15.0-15.1, BH411_18.0-18.1, BH411_26.0-26.1	**12-APR-2011**	**19-APR-2011**	26-APR-2011	✓	**24-APR-2011**	26-APR-2011	✓
Soil Glass Jar - Unpreserved							
QC632	**13-APR-2011**	**19-APR-2011**	27-APR-2011	✓	**24-APR-2011**	27-APR-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**21-APR-2011**	**27-APR-2011**	28-APR-2011	✓	**27-APR-2011**	06-JUN-2011	✓
Soil Glass Jar - Unpreserved							
BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**12-APR-2011**	**20-APR-2011**	26-APR-2011	✓	**21-APR-2011**	30-MAY-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
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**21-APR-2011**	**27-APR-2011**	28-APR-2011	✓	**27-APR-2011**	06-JUN-2011	✓
Soil Glass Jar - Unpreserved BH411_3.1-3.2, BH411_10.0-10.1, BH411_19.0-19.1, BH411_23.0-23.1	**12-APR-2011**	**20-APR-2011**	26-APR-2011	✓	**21-APR-2011**	30-MAY-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 - Nitric Acid; Unspecified QC630	**12-APR-2011**	**---**	09-OCT-2011	----	**20-APR-2011**	09-OCT-2011	✓
Clear Plastic Bottle - Nitric Acid; Unspecified QC633	**13-APR-2011**	**---**	10-OCT-2011	----	**20-APR-2011**	10-OCT-2011	✓
Clear Plastic Bottle - Nitric Acid; Unspecified QC635	**14-APR-2011**	**---**	11-OCT-2011	----	**20-APR-2011**	11-OCT-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unspecified QC630	**12-APR-2011**	**---**	10-MAY-2011	----	**21-APR-2011**	10-MAY-2011	✓
Clear Plastic Bottle - Nitric Acid; Unspecified QC633	**13-APR-2011**	**---**	11-MAY-2011	----	**21-APR-2011**	11-MAY-2011	✓
Clear Plastic Bottle - Nitric Acid; Unspecified QC635	**14-APR-2011**	**---**	12-MAY-2011	----	**21-APR-2011**	12-MAY-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved QC630	**12-APR-2011**	**19-APR-2011**	19-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC633	**13-APR-2011**	**19-APR-2011**	20-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC635	**14-APR-2011**	**19-APR-2011**	21-APR-2011	✓	**20-APR-2011**	29-MAY-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 QC630	**12-APR-2011**	**19-APR-2011**	19-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC633	**13-APR-2011**	**19-APR-2011**	20-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC635	**14-APR-2011**	**19-APR-2011**	21-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber VOC Vial - HCl QC630	**12-APR-2011**	**25-APR-2011**	26-APR-2011	✓	**25-APR-2011**	26-APR-2011	✓
Amber VOC Vial - HCl QC633	**13-APR-2011**	**25-APR-2011**	27-APR-2011	✓	**25-APR-2011**	27-APR-2011	✓
Amber VOC Vial - HCl QC635	**14-APR-2011**	**25-APR-2011**	28-APR-2011	✓	**25-APR-2011**	28-APR-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved QC630	**12-APR-2011**	**19-APR-2011**	19-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC633	**13-APR-2011**	**19-APR-2011**	20-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber Glass Bottle - Unpreserved QC635	**14-APR-2011**	**19-APR-2011**	21-APR-2011	✓	**20-APR-2011**	29-MAY-2011	✓
Amber VOC Vial - HCl QC630	**12-APR-2011**	**25-APR-2011**	26-APR-2011	✓	**25-APR-2011**	26-APR-2011	✓
Amber VOC Vial - HCl QC633	**13-APR-2011**	**25-APR-2011**	27-APR-2011	✓	**25-APR-2011**	27-APR-2011	✓
Amber VOC Vial - HCl QC635	**14-APR-2011**	**25-APR-2011**	28-APR-2011	✓	**25-APR-2011**	28-APR-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl QC630	**12-APR-2011**	**25-APR-2011**	26-APR-2011	✓	**25-APR-2011**	26-APR-2011	✓
Amber VOC Vial - HCl QC633	**13-APR-2011**	**25-APR-2011**	27-APR-2011	✓	**25-APR-2011**	27-APR-2011	✓
Amber VOC Vial - HCl QC635	**14-APR-2011**	**25-APR-2011**	28-APR-2011	✓	**25-APR-2011**	28-APR-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 - Low-Level in Sediment	EK055-SD	2	14	**14.3**	**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)	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	18	**11.1**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia - Low-Level in Sediment	EK055-SD	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**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	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	18	**5.6**	**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)							
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	12	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.0**	**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)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	26	**7.7**	**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)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
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	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	26	**7.7**	**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)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	12	**8.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.0**	**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).
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)
Ammonia as N by Discrete analyser	EK055G	SOIL	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Buchi Ammonia - Low-Level in Sediment	EK055-SD	SOIL	APHA 21st ed., 4500 NH3+-B&G, H Samples are steam distillated (Buchi) prior to analysis and quantified using titrimetric determination.
TPH - Semivolatile Fraction	EP071	SOIL	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 (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)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
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.
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)

Analytical Methods	Method	Matrix	Method Descriptions
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Deionised Water Leach	EN60-DIa	SOIL	AS4439.3 Preparation of Leachates
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)
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	SOIL	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.
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/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
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 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							
EP132A: Phenolic Compounds	2068109-002	----	**Pentachlorophenol**	87-86-5	82.1 %	32.4-81.6%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2068109-002	----	**2.3.4.6-Tetrachlorophenol**	58-90-2	95.4 %	30.4-92.8%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2068109-002	----	**2.4.5-Trichlorophenol**	95-95-4	111 %	47.3-111%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG020F: Dissolved Metals by ICP-MS	2067406-009	----	**Chromium**	7440-47-3	88.2 %	91-111%	**Recovery less than lower control limit**

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

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1110009**	Page	: 1 of 19
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 12-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Site	: ----		
		No. of samples received	: 29
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control 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*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG005T: Poor precision was obtained for some elements on sample ES1110387 #15 due to sample heterogeneity.**
- **EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs**
- **EP080:Level of reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **ASLP ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<5	<5	<5	<5	<5
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**90.6**	**100**	**92.3**	**83.4**	**95.5**
Toluene-D8	2037-26-5	0.1	%	**109**	**90.1**	**106**	**99.3**	**109**
4-Bromofluorobenzene	460-00-4	0.1	%	**116**	**91.6**	**110**	**102**	**117**

Analytical Results

Sub-Matrix: **ASLP ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
				ES1110009-025	ES1110009-026	----	----	----
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	----	----
Toluene	108-88-3	2	µg/L	<5	<5	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**83.6**	**92.1**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**98.9**	**107**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	**113**	----	----	----

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.003**	**0.002**	**0.003**	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	**0.0004**	**0.0007**	**0.0001**	**0.0002**
Chromium	7440-47-3	0.001	mg/L	<0.001	**0.006**	**0.001**	**0.002**	<0.001
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.005**	**0.017**	**0.002**	**0.002**
Lead	7439-92-1	0.001	mg/L	**0.004**	**0.005**	**0.003**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.003**	**0.005**	**0.008**	**0.002**
Zinc	7440-66-6	0.005	mg/L	**0.209**	**0.234**	**0.592**	**0.108**	**0.205**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.04**	<0.01	**0.62**	<0.01	**0.01**
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	**10.7**	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	**3.8**	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	**10.3**	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	**9.4**	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	**17.6**	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	**3.8**	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	**3.0**	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	**2.1**	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	**60.7**	<0.5	<0.5
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	<2	**4**	<2	<2
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	<50	<50	**130**	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	**580**	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	**710**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	**240**	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	**470**	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	**710**	<100	<100
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**28.3**	**28.7**	**29.9**	**30.0**	**29.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**68.3**	**73.4**	**81.9**	**67.8**	**81.9**
2.4.6-Tribromophenol	118-79-6	0.1	%	**82.8**	**99.2**	**102**	**96.2**	**97.6**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**86.8**	**97.7**	**83.0**	**86.0**	**83.9**
Anthracene-d10	1719-06-8	0.1	%	**85.5**	**96.2**	**93.8**	**90.8**	**86.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**100**	**114**	**112**	**102**	**106**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**53.1**	**64.9**	**68.8**	**72.7**	**70.4**
Phenol-d6	13127-88-3	0.1	%	**30.1**	**36.9**	**37.1**	**33.4**	**36.1**
2-Chlorophenol-D4	93951-73-6	0.1	%	**71.2**	**83.2**	**89.6**	**83.6**	**82.0**
2.4.6-Tribromophenol	118-79-6	0.1	%	**71.8**	**82.6**	**87.4**	**76.7**	**77.1**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**77.2**	**89.7**	**90.8**	**81.5**	**83.5**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**68.0**	**76.7**	**79.1**	**70.2**	**68.3**
2-Fluorobiphenyl	321-60-8	0.1	%	**88.3**	**99.3**	**103**	**91.9**	**92.3**
Anthracene-d10	1719-06-8	0.1	%	**82.3**	**93.0**	**93.8**	**87.9**	**86.6**
4-Terphenyl-d14	1718-51-0	0.1	%	**82.0**	**94.7**	**97.1**	**90.0**	**87.7**

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
				ES1110009-025	ES1110009-026	----	----	----
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.003**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	**0.0010**	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	**0.002**	----	----	----
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.018**	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	**0.001**	----	----	----
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.005**	----	----	----
Zinc	7440-66-6	0.005	mg/L	**0.292**	**0.677**	----	----	----
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.01**	**0.66**	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	----	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	**33.0**	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	**10.5**	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	**21.6**	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	**20.8**	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	**2.1**	**45.2**	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	**11.9**	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	**1.1**	**7.6**	----	----	----
Pyrene	129-00-0	1.0	µg/L	**1.0**	**5.4**	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
				ES1110009-025	ES1110009-026	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	**4.2**	**156**	----	----	----
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	**10**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	<50	**190**	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	**740**	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	**930**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
>C10 - C16 Fraction	----	100	µg/L	<100	**320**	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	**640**	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	**960**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**34.2**	**34.9**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**83.7**	**82.3**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**105**	**114**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**98.4**	**82.6**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**99.5**	**95.2**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**116**	**107**	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**88.7**	**81.3**	----	----	----
Phenol-d6	13127-88-3	0.1	%	**43.0**	**45.2**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**90.8**	**91.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**86.0**	**90.3**	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**91.9**	**92.2**	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**77.2**	**78.3**	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%	**102**	**105**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**96.5**	**95.0**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**98.1**	**98.2**	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	15.5	11.9	25.2	22.4	18.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	11	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	8	19	3	4
Copper	7440-50-8	5	mg/kg	80	51	48	<5	5
Lead	7439-92-1	5	mg/kg	269	309	417	11	<5
Nickel	7440-02-0	2	mg/kg	13	7	9	<2	<2
Zinc	7440-66-6	5	mg/kg	304	302	361	23	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	2.0	6.2	1.1	<0.1	<0.1
EK026: Total Cyanide								
Total Cyanide	57-12-5	1	mg/kg	<1	<1	2	<1	<1
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	9.1	8.9	8.5	8.4	7.9
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Final pH	----	0.1	pH Unit	9.1	8.9	8.5	8.4	7.9
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	2.8	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	5.2	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	4.1	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	4.8	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	24.4	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	9.7	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	23.0	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	21.3	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	9.6	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	7.9	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	8.9	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	4.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	7.7	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	3.3	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.8	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	3.9	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	142	<0.5	<0.5
EP075H: Anilines and Benzidines								

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EP075H: Anilines and Benzidines - Continued								
Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.7	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	840	1160	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	280	650	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	1120	1810	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	100	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	1000	1470	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	150	510	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	1150	2080	<50	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	89.0	89.7	90.1	92.9	97.2
2-Chlorophenol-D4	93951-73-6	0.1	%	91.8	91.3	95.0	95.2	97.1
2.4.6-Tribromophenol	118-79-6	0.1	%	69.6	80.1	98.7	80.5	100
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	103	102	105	107	106
Anthracene-d10	1719-06-8	0.1	%	112	112	103	116	118
4-Terphenyl-d14	1718-51-0	0.1	%	113	113	114	116	115
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	62.3	61.2	53.2	48.4	58.3
Phenol-d6	13127-88-3	0.1	%	62.3	57.7	62.0	60.9	59.1
2-Chlorophenol-D4	93951-73-6	0.1	%	63.0	57.3	64.1	61.4	61.3
2.4.6-Tribromophenol	118-79-6	0.1	%	59.3	58.3	63.6	58.5	57.1

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00
				ES1110009-003	ES1110009-006	ES1110009-010	ES1110009-016	ES1110009-019
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**77.0**	**70.8**	**78.5**	**79.4**	**75.6**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**70.7**	**64.4**	**73.5**	**74.2**	**69.5**
2-Fluorobiphenyl	321-60-8	0.1	%	**75.8**	**68.8**	**77.2**	**77.2**	**74.9**
Anthracene-d10	1719-06-8	0.1	%	**76.4**	**75.2**	**78.8**	**78.1**	**78.8**
4-Terphenyl-d14	1718-51-0	0.1	%	**79.4**	**76.7**	**82.2**	**83.6**	**83.1**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**112**	**104**	**96.7**	**99.8**	**94.6**
Toluene-D8	2037-26-5	0.1	%	**109**	**101**	**93.9**	**98.6**	**99.0**
4-Bromofluorobenzene	460-00-4	0.1	%	**102**	**97.5**	**90.9**	**96.4**	**98.0**

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1110009-025	ES1110009-026	----	----	----
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1.0	%		15.0	24.3	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	17	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		23	25	----	----	----
Copper	7440-50-8	5	mg/kg		<5	64	----	----	----
Lead	7439-92-1	5	mg/kg		6	385	----	----	----
Nickel	7440-02-0	2	mg/kg		5	10	----	----	----
Zinc	7440-66-6	5	mg/kg		7	408	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	1.8	----	----	----
EK026: Total Cyanide									
Total Cyanide	57-12-5	1	mg/kg		<1	1	----	----	----
EN60: Bottle Leaching Procedure									
Final pH	----	0.1	pH Unit		7.8	8.0	----	----	----
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)									
Final pH	----	0.1	pH Unit		7.8	8.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	2.6	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	5.0	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	4.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	4.9	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	24.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	8.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	23.6	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	21.0	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	9.9	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	8.2	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	9.1	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	4.9	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	8.0	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	3.4	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	0.7	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	4.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	143	----	----	----
EP075H: Anilines and Benzidines									

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1110009-025	ES1110009-026	----	----	----
EP075H: Anilines and Benzidines - Continued									
Dibenzofuran	132-64-9	0.5	mg/kg		<0.5	**5.8**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		**22**	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	**1280**	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	**710**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	**1990**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		**22**	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	**130**	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	**1650**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	**530**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	**2310**	----	----	----
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		**16.4**	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
EP080: BTEXN									
^ Sum of BTEX	----	0.2	mg/kg		**16.4**	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**90.9**	**90.0**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**93.0**	**94.1**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**80.2**	**98.6**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**106**	**106**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**111**	**106**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**114**	**114**	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**56.4**	**41.1**	----	----	----
Phenol-d6	13127-88-3	0.1	%		**64.2**	**72.7**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**66.9**	**74.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**60.4**	**73.3**	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	11-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
					ES1110009-025	ES1110009-026	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		**81.3**	**95.9**	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		**76.2**	**86.6**	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%		**79.6**	**87.4**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**83.2**	**89.9**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**83.8**	**96.3**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**103**	**101**	----	----	----
Toluene-D8	2037-26-5	0.1	%		**96.6**	**103**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**82.7**	**97.2**	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC638	QC641	QC642	----	----
				Client sampling date / time: [13-MAY-2011]	[13-MAY-2011]	[13-MAY-2011]	----	----
				ES1110009-028	ES1110009-029	ES1110009-030	----	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	**1.0**	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.9	<0.9	**1.0**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC638	QC641	QC642	----	----
				Client sampling date / time: [13-MAY-2011]	[13-MAY-2011]	[13-MAY-2011]	----	----
				ES1110009-028	ES1110009-029	ES1110009-030	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<5	<5	<5	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**44.6**	**39.6**	**32.8**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**83.6**	**82.1**	**79.5**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**54.5**	**69.0**	**70.2**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**60.0**	**72.9**	**68.1**	----	----
Anthracene-d10	1719-06-8	0.1	%	**78.8**	**83.4**	**86.0**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**64.3**	**71.2**	**69.3**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**87.5**	**103**	**94.9**	----	----
Toluene-D8	2037-26-5	0.1	%	**105**	**95.9**	**107**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**88.1**	**88.4**	**90.0**	----	----

Surrogate Control Limits

Sub-Matrix: ASLP ZHE LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Sub-Matrix: DI WATER LEACHATE		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	116.6
Phenol-d6	13127-88-3	10.0	69.0
2-Chlorophenol-D4	93951-73-6	20.9	129.7
2.4.6-Tribromophenol	118-79-6	10.0	150.7
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29.4	141.7
1.2-Dichlorobenzene-D4	2199-69-1	23.6	120.7
2-Fluorobiphenyl	321-60-8	27.2	134.9
Anthracene-d10	1719-06-8	29.7	140.7
4-Terphenyl-d14	1718-51-0	27.6	143.6

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	147.0

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075S: Acid Extractable Surrogates - Continued			
Phenol-d6	13127-88-3	12.5	110.6
2-Chlorophenol-D4	93951-73-6	10.0	116.8
2.4.6-Tribromophenol	118-79-6	10.0	120.1
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	13.3	124.5
1.2-Dichlorobenzene-D4	2199-69-1	11.9	103.9
2-Fluorobiphenyl	321-60-8	11.3	126.1
Anthracene-d10	1719-06-8	13.1	128.1
4-Terphenyl-d14	1718-51-0	10.0	134.7
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Form:

AECOM

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 39546405

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8152			

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: fil'ed	acid	ice	other	Container (No. & type)	Soil - 5-26	8 metals in PAH / BTEX	PAH	HOLD	WATER - 10-26	TPH / BTEX / PAH / 12 metals	SAL - PAH / BTEX	Remarks & comments
1	BH410_0.2-0.4		10.5.11	x					x		Jar				x				Details: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn
2	BH410_1.2-1.4		↓	x											x				
3	BH410_2.0-2.2			x									✓		x				
4	BH410_4.0-4.1			x											x				
5	BH410_5.0-5.1			x											x				
6	BH410_7.0-7.2			x									✓		x				
7	BH410_11.0-11.2		↓	x											x				
8	BH410_13.0-13.2		12.5.11	x											x				
9	BH410_15.0-15.2		↓	x											x				
10	BH410_17.0-17.5		↓	x									✓		x				

Please contact Kate O'Brien for details of Samples to be analysed as per attached email. WS 13/5 1510

Environmental Division Sydney
Work Order
ES1110009
Telephone : +61-2-8784 8555

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12.5.11	Name: W. SAUER Date: 12/5	Samples received chilled?	Yes/No/NA Lab /	Consignment Note No.	Labmark
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA Organised by / Date:	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W. SAUER UPDATED COC Date: 13/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: ALS Time: 1510		Yes/No/NA Attach By PC / Internal Sheet:	Transport Co:	

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Environment

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 39540AUS

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr ____ days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8152			

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: SOIL - 5-26	8 metals/TPH/BTEX/PAH	PAH	HOLD	WATER - 6-26	TPH/BTEX/PAH/2 metals	SOIL - VTPH/BTEX	Remarks & comments
11	BH410_18.0-18.2	11.5.11		x					x		Jar				x				Please contact Kate O'Brien for details of samples to be analysed
12	BH410_19.0-19.2			x					x						x				
13	BH410_20.0-20.2			x					x						x				
14	BH410_21.0-21.2			x					x						x				
15	BH410_22.0-22.2			x					x						x				
16	BH410_23.0-23.2			x					x				✓		x				
17	BH410_24.0-24.2			x					x						x				
18	BH410_25.0-25.2	↓		x					x						x				
19	BH410_26.0-26.2	12.5.11		x					x						x				
20	BH410_27.0-27.2	↓		x					x		↓				x				Details: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn

Relinquished By:
Name: Dirk Sanderson Date: 12.5.11
of: AECOM Time: 14:00

Received by:
Name: W. SALEH Date: 12/5
of: ALS Time: 1800

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: W. SALEH UPDATED COC Date: 13/5
of: ALS Time: 1510

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

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Form:

AECOM

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 3954GMOS

Sample collected by: **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filtered	acid	ice	other	Container (No. & type)	Analysis Request: Soil - S-26	8 metals / TPH / BTEX / PAH	HOLD	WATER - to 26	TPH / BTEX / PAH / 8 metals	Soil - VTPH / BTEX	Remarks & comments
21	BH410_28.0-28.1		12.5.11	X					X		Jar			X				Please contact Kate O'Brien for details of samples to be analysed
22	BH410_29.0-29.2		↓	X					X		↓			X				
23	BH410_30.0-30.2			X					X					X				
24	BH410_31.0-31.2			X					X					X				
25	BH410_32.0-32.2			X					X				✓	X				
26	QC639		11.5.11	X					X				✓	X				
27	QC640		11.5.11	X					X		↓			X	SEND TO MGT/LABMAKER			
28	QC638	10.5.11		~~X~~	X				X		2V, 1A, 1P					X	X	
29	QC641	11.5.11			X				X		↓					X	X	
30	QC642	12.5.11			X				X		↓					X	X	

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12.5.11	Name: W. SAUEH Date: 12/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	**Received in good condition?**	**Yes/No/NA**	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W. SAUEH UPDATED COC Date: 13/5	**Samples received chilled?**	**Yes/No/NA**	**Consignment Note No.**	
of: Time:	of: ALS Time: 1510		Yes/No/NA	Transport Co:	

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Revision: Oct 08
BMS-PM-DV-F046

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1110009**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: DS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 12-MAY-2011	Issue Date	: 17-MAY-2011 22:17
Client Requested Due Date	: 20-MAY-2011	Scheduled Reporting Date	: **20-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.8'C - Ice present
No. of coolers/boxes	: 1 HATRD	No. of samples received	: 29
Security Seal	: Intact.	No. of samples analysed	: 10

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample QC640 to be forwarded to Labmark.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - S-26 8 metals/TPH/BTEX/PAH
ES1110009-001	11-MAY-2011 15:00	BH410_0.2-0.4	✓	
ES1110009-002	11-MAY-2011 15:00	BH410_1.2-1.4	✓	
ES1110009-003	11-MAY-2011 15:00	BH410_2.0-2.2		✓
ES1110009-004	11-MAY-2011 15:00	BH410_4.0-4.1	✓	
ES1110009-005	11-MAY-2011 15:00	BH410_5.0-5.1	✓	
ES1110009-006	11-MAY-2011 15:00	BH410_7.0-7.2		✓
ES1110009-007	11-MAY-2011 15:00	BH410_11.0-11.2	✓	
ES1110009-008	11-MAY-2011 15:00	BH410_13.0-13.2	✓	
ES1110009-009	11-MAY-2011 15:00	BH410_15.0-15.2	✓	
ES1110009-010	11-MAY-2011 15:00	BH410_17.0-17.5		✓
ES1110009-011	11-MAY-2011 15:00	BH410_18.0-18.2	✓	
ES1110009-012	11-MAY-2011 15:00	BH410_19.0-19.2	✓	
ES1110009-013	11-MAY-2011 15:00	BH410_20.0-20.2	✓	
ES1110009-014	11-MAY-2011 15:00	BH410_21.0-21.2	✓	
ES1110009-015	11-MAY-2011 15:00	BH410_22.0-22.2	✓	
ES1110009-016	11-MAY-2011 15:00	BH410_23.0-23.2		✓
ES1110009-017	11-MAY-2011 15:00	BH410_24.0-24.2	✓	
ES1110009-018	11-MAY-2011 15:00	BH410_25.0-25.2	✓	
ES1110009-019	11-MAY-2011 15:00	BH410_26.0-26.2		✓
ES1110009-020	11-MAY-2011 15:00	BH410_27.0-27.2	✓	
ES1110009-021	11-MAY-2011 15:00	BH410_28.0-28.1	✓	
ES1110009-022	11-MAY-2011 15:00	BH410_29.0-29.2	✓	
ES1110009-023	11-MAY-2011 15:00	BH410_30.0-30.2	✓	
ES1110009-024	11-MAY-2011 15:00	BH410_31.0-31.2	✓	
ES1110009-025	11-MAY-2011 15:00	BH410_32.0-32.2		✓
ES1110009-026	11-MAY-2011 15:00	QC639		✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-26 TPH/BTEX/PAH/8 Metals
ES1110009-028	[13-MAY-2011]	QC638	✓
ES1110009-029	[13-MAY-2011]	QC641	✓
ES1110009-030	[13-MAY-2011]	QC642	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE MCGRATH

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- A4 - AU Tax Invoice (INV)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1110009**	Page	: 1 of 21
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 12-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 29
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This 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*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Nanthini Coilparampil	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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: 1792849)									
EM1105053-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	25.9	26.2	1.2	0% - 20%
ES1109964-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	94.0	94.5	0.6	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1790776)									
ES1110006-009	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	21	47.1	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	8	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	19	20	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	20	46	79.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	19	22	18.0	No Limit
ES1110009-006	BH410_7.0-7.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	10	31.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	10	43.9	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	51	62	20.6	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	309	280	9.9	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	302	278	8.4	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1797061)									
ES1110009-019	BH410_26.0-26.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	5	5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
ES1110387-015	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	13	# 56.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	14	6	87.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	8	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1790777)									
ES1110006-009	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1110060-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	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 (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1797062)									
ES1110009-019	BH410_26.0-26.2	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1110387-015	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK026: Total Cyanide (QC Lot: 1794766)									
ES1110009-003	BH410_2.0-2.2	EK026: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EK026: Total Cyanide (QC Lot: 1796646)									
ES1110009-025	BH410_32.0-32.2	EK026: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 1791423)									
ES1110047-002	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
ES1110047-009	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

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: 1792630)									
ES1110009-019	BH410_26.0-26.2	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	<0.5	<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
EP075H: Anilines and Benzidines (QC Lot: 1794744)									
ES1110009-016	BH410_23.0-23.2	EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1789822)									
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1110060-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1791422)									
ES1110047-002	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
ES1110047-009	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1792472)									
ES1110064-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1110064-010	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1792629)									
ES1110009-019	BH410_26.0-26.2	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
ES1110064-010	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1789822)									

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: 1789822) - continued									
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1110060-003	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1791422)									
ES1110047-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1110047-009	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1792472)									
ES1110064-001	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1110064-010	Anonymous	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1792629)									
ES1110009-019	BH410_26.0-26.2	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
ES1110064-010	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 1789822)									
ES1110009-003	BH410_2.0-2.2	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: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1110060-003	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 1792472)									
ES1110064-001	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

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: BTEXN (QC Lot: 1792472) - continued									
ES1110064-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1110064-010	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory 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: 1790875)									
ES1109973-014	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
ES1110009-028	QC638	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.005	131	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	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 1799608)									
ES1110009-003	BH410_2.0-2.2	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.209	0.220	5.0	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 1790873)									
ES1109779-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1109961-006	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035W: Water Leachable Mercury by FIMS (QC Lot: 1800078)									
ES1110009-003	BH410_2.0-2.2	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1799456)									
ES1110009-003	BH410_2.0-2.2	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1110599-004	Anonymous	EK026G: Total Cyanide	57-12-5	0.004	mg/L	0.136	0.132	3.5	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1799669)									
ES1110009-003	BH410_2.0-2.2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.05	28.6	No Limit
ES1110360-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.07	37.9	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1796632)									
ES1109854-029	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1110009-029	QC641	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1799428)									
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1796632)									
ES1109854-029	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1110009-029	QC641	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1799428)									
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1796632)									
ES1109854-029	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1110009-029	QC641	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
EP080: BTEXN (QC Lot: 1799428)									
ES1110009-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 1799428) - continued									
ES1110009-003	BH410_2.0-2.2	EP080: Naphthalene	91-20-3	5	µg/L	<5	<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: 1790776)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	118	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	93.6	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	100	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	95.4	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	101	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	102	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	93.5	88.9	112
EG005T: Total Metals by ICP-AES (QCLot: 1797061)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	110	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	100	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	102	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	104	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	95.1	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	104	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	94.3	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1790777)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	78.6	67	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1797062)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	106	67	118
EK026: Total Cyanide (QCLot: 1794766)								
EK026: Total Cyanide	57-12-5	1.0	mg/kg	<1	20.0 mg/kg	93.6	70	130
EK026: Total Cyanide (QCLot: 1796646)								
EK026: Total Cyanide	57-12-5	1.0	mg/kg	<1	20.0 mg/kg	96.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1791423)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	89.4	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.4	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	99.5	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	96.0	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	87.2	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	92.7	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	88.9	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	89.1	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.0	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	79.8	114

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1791423) - continued								
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	88.4	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	83.2	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	93.9	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	82.1	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.2	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	91.5	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1792630)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	91.5	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	87.9	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	90.6	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	90.0	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	93.0	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	98.3	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	95.8	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	96.0	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	87.5	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	110	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	98.0	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	102	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	87.5	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	85.1	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	94.9	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	97.5	72.4	114
EP075H: Anilines and Benzidines (QCLot: 1794744)								
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.25 mg/kg	93.0	60.2	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1789822)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	104	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1791422)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	124	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	105	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1792472)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1792629)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	122	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	102	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1789822)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1789822) - continued								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	103	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1791422)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	106	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	118	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	200 mg/kg	77.8	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1792472)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	97.2	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1792629)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	107	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	115	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	76.8	63	131
EP080: BTEXN (QCLot: 1789822)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	73.5	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	119	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	79.1	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	85.5	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	78.7	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.1	63	131
EP080: BTEXN (QCLot: 1792472)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	110	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	110	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	109	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	114	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1790875)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	95.2	88	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.2	89	107
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.9	91	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	94.3	87	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.9	90	110

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 1790875) - continued								
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.1	89	109
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.7	85	115
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1799608)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	87	111
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	90	106
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	94	114
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	105	90	112
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	88	120
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	86	116
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	82	116
EG035F: Dissolved Mercury by FIMS (QCLot: 1790873)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	103	86	116
EG035W: Water Leachable Mercury by FIMS (QCLot: 1800078)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.5	82	118
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1799456)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	98.4	70	112
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1799669)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	108	79.6	122
EP075(SIM)A: Phenolic Compounds (QCLot: 1799600)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	2 µg/L	48.2	24.5	61.9
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	2 µg/L	84.0	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	2 µg/L	84.6	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	4 µg/L	70.5	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	2 µg/L	82.3	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	2 µg/L	81.5	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	2 µg/L	81.4	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	2 µg/L	80.3	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	2 µg/L	82.4	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	2 µg/L	89.1	58.7	118
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)A: Phenolic Compounds (QCLot: 1799600) - continued								
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	2 µg/L	96.1	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	4 µg/L	34.8	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1789846)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	75.8	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	93.5	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	84.9	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	90.7	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	95.8	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	96.5	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	107	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	103	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	95.3	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	86.3	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	82.9	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	84.6	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	103	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	87.8	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	87.8	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	90.5	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1799600)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1799600) - continued								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	2 µg/L	84.4	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	2 µg/L	86.6	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	2 µg/L	88.7	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	2 µg/L	88.8	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	2 µg/L	93.6	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	2 µg/L	91.4	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	2 µg/L	89.7	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	2 µg/L	92.8	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	2 µg/L	96.7	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	2 µg/L	94.3	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	2 µg/L	82.5	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	2 µg/L	100	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	2 µg/L	101	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	2 µg/L	83.7	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	2 µg/L	83.3	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	2 µg/L	83.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP075H: Anilines and Benzidines (QCLot: 1799599)								
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	5 µg/L	72.8	65.3	108
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1789845)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	78.1	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	87.1	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	92.1	62.7	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: 1796632)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	104	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1799428)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	82.6	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1799598)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	105	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	134	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	116	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1789845)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	68.3	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	94.6	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	102	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1796632)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	102	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1799428)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	83.0	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1799598)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	126	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	129	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	113	62.7	131
EP080: BTEXN (QCLot: 1796632)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	81.2	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	93.2	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	88.9	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	82.1	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	75.1	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	84.5	72.9	127
EP080: BTEXN (QCLot: 1799428)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	94.8	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	87.3	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	86.3	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	86.3	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	87.2	73	121

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: BTEXN (QCLot: 1799428) - continued								
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	87.8	72.9	127

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: 1790776)							
ES1110006-009	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.8	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	92.0	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	98.4	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	101	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	99.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 1797061)							
ES1110009-019	BH410_26.0-26.2	EG005T: Arsenic	7440-38-2	50 mg/kg	95.1	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	98.9	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.5	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.7	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.1	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.5	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1790777)							
ES1110006-009	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	71.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1797062)							
ES1110009-019	BH410_26.0-26.2	EG035T: Mercury	7439-97-6	5 mg/kg	106	70	130
EK026: Total Cyanide (QCLot: 1794766)							
ES1110009-003	BH410_2.0-2.2	EK026: Total Cyanide	57-12-5	20.0 mg/kg	89.6	70	130
EK026: Total Cyanide (QCLot: 1796646)							
ES1110009-025	BH410_32.0-32.2	EK026: Total Cyanide	57-12-5	20.0 mg/kg	91.6	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1791423)							
ES1110047-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	87.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.7	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1792630)							
ES1110009-019	BH410_26.0-26.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1789822)							
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	90.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1791422)							
ES1110047-002	Anonymous	EP071: C10 - C14 Fraction	----	640 mg/kg	83.7	73	137

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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1791422) - continued							
ES1110047-002	Anonymous	EP071: C15 - C28 Fraction	----	3140 mg/kg	91.4	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	89.2	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1792472)							
ES1110064-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	78.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1792629)							
ES1110009-019	BH410_26.0-26.2	EP071: C10 - C14 Fraction	----	640 mg/kg	107	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.7	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1789822)							
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	37.5 mg/kg	91.6	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1791422)							
ES1110047-002	Anonymous	EP071: >C10 - C16 Fraction	----	850 mg/kg	89.8	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	84.9	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	93.3	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1792472)							
ES1110064-001	Anonymous	EP080: C6 - C10 Fraction	----	37.5 mg/kg	84.6	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1792629)							
ES1110009-019	BH410_26.0-26.2	EP071: >C10 - C16 Fraction	----	850 mg/kg	114	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	95.4	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	67.0	52	132
EP080: BTEXN (QCLot: 1789822)							
ES1110009-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	2.5 mg/kg	74.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	83.1	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	85.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.9	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	87.6	70	130
EP080: BTEXN (QCLot: 1792472)							
ES1110064-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	73.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	86.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	85.8	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	87.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.0	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	72.8	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: 1790875)							
ES1109973-014	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	116	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	114	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	116	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	110	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	115	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	118	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	108	70	130
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1799608)							
ES1110009-003	BH410_2.0-2.2	EG020A-W: Arsenic	7440-38-2	1 mg/L	107	70	130
		EG020A-W: Cadmium	7440-43-9	0.250 mg/L	106	70	130
		EG020A-W: Chromium	7440-47-3	1 mg/L	108	70	130
		EG020A-W: Copper	7440-50-8	1 mg/L	110	70	130
		EG020A-W: Lead	7439-92-1	1 mg/L	106	70	130
		EG020A-W: Nickel	7440-02-0	1 mg/L	104	70	130
		EG020A-W: Zinc	7440-66-6	1 mg/L	112	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1790873)							
ES1109779-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	80.5	70	130
EG035W: Water Leachable Mercury by FIMS (QCLot: 1800078)							
ES1110009-006	BH410_7.0-7.2	EG035W: Mercury	7439-97-6	0.0100 mg/L	106	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1799456)							
ES1110009-003	BH410_2.0-2.2	EK026G: Total Cyanide	57-12-5	0.2 mg/L	105	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1799669)							
ES1110009-003	BH410_2.0-2.2	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	109	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1796632)							
ES1109854-029	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	105	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1799428)							
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	325 µg/L	96.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1796632)							
ES1109854-029	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	104	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1799428)							
ES1110009-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	375 µg/L	94.2	70	130
EP080: BTEXN (QCLot: 1796632)							
ES1109854-029	Anonymous	EP080: Benzene	71-43-2	25 µg/L	97.3	70	130
		EP080: Toluene	108-88-3	25 µg/L	107	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: Spike Recovery (%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
EP080: BTEXN (QCLot: 1796632) - continued							
ES1109854-029	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	105	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	106	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	102	70	130
EP080: BTEXN (QCLot: 1799428)							
ES1110009-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	25 µg/L	90.6	70	130
		EP080: Toluene	108-88-3	25 µg/L	90.2	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	93.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.9	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.9	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	89.3	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1110009**	Page	: 1 of 13
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 12-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Order number	: 39540AUS	No. of samples received	: 29
Quote number	: SY/418/10 V2	No. of samples analysed	: 10

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); 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 BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**----**	----	----	**18-MAY-2011**	25-MAY-2011	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**17-MAY-2011**	07-NOV-2011	✓	**17-MAY-2011**	07-NOV-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**20-MAY-2011**	07-NOV-2011	✓	**20-MAY-2011**	07-NOV-2011	✓
EG020W: Water Leachable Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	07-NOV-2011	✓	**25-MAY-2011**	07-NOV-2011	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**17-MAY-2011**	08-JUN-2011	✓	**19-MAY-2011**	08-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**20-MAY-2011**	08-JUN-2011	✓	**23-MAY-2011**	08-JUN-2011	✓
EG035W: Water Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**----**	----	----	**23-MAY-2011**	08-JUN-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
EK026: Total Cyanide							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, QC639	**11-MAY-2011**	**20-MAY-2011**	18-MAY-2011	×	**20-MAY-2011**	03-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_32.0-32.2	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**23-MAY-2011**	06-JUN-2011	✓
EK026G: Total Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	25-MAY-2011	✓	**23-MAY-2011**	25-MAY-2011	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**---**	08-JUN-2011	----	**23-MAY-2011**	08-JUN-2011	✓
EN60: Bottle Leaching Procedure							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**---**	25-MAY-2011	----	**20-MAY-2011**	25-MAY-2011	✓
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5	**11-MAY-2011**	**---**	25-MAY-2011	----	**20-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**---**	25-MAY-2011	----	**22-MAY-2011**	25-MAY-2011	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	02-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)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	02-JUL-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	26-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	27-JUN-2011	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	02-JUL-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**19-MAY-2011**	25-MAY-2011	✓	**20-MAY-2011**	28-JUN-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**22-MAY-2011**	25-MAY-2011	✓	**23-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	26-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	27-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	25-MAY-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							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**23-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**22-MAY-2011**	25-MAY-2011	✓	**23-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	26-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	27-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	25-MAY-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	25-MAY-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**22-MAY-2011**	25-MAY-2011	✓	**23-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_32.0-32.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**18-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2	**11-MAY-2011**	**18-MAY-2011**	25-MAY-2011	✓	**19-MAY-2011**	25-MAY-2011	✓

Matrix: **WATER**

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered							
QC638, QC641, QC642	**13-MAY-2011**	---	09-NOV-2011	----	**17-MAY-2011**	09-NOV-2011	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered							
QC638, QC641, QC642	**13-MAY-2011**	---	10-JUN-2011	----	**18-MAY-2011**	10-JUN-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
QC638, QC641, QC642	**13-MAY-2011**	**16-MAY-2011**	20-MAY-2011	✓	**17-MAY-2011**	25-JUN-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
QC638, QC641, QC642	**13-MAY-2011**	**16-MAY-2011**	20-MAY-2011	✓	**17-MAY-2011**	25-JUN-2011	✓
Amber VOC Vial - HCl							
QC638, QC641, QC642	**13-MAY-2011**	**20-MAY-2011**	27-MAY-2011	✓	**20-MAY-2011**	27-MAY-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved							
QC638, QC641, QC642	**13-MAY-2011**	**16-MAY-2011**	20-MAY-2011	✓	**17-MAY-2011**	25-JUN-2011	✓
Amber VOC Vial - HCl							
QC638, QC641, QC642	**13-MAY-2011**	**20-MAY-2011**	27-MAY-2011	✓	**20-MAY-2011**	27-MAY-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl							
QC638, QC641, QC642	**13-MAY-2011**	**20-MAY-2011**	27-MAY-2011	✓	**20-MAY-2011**	27-MAY-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	18	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	3	21	14.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	14.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	2	7	28.6	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	26	15.4	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	36	11.1	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	39	10.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	14.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	2	7	28.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	26	7.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	36	5.6	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	39	5.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	14.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	2	7	28.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	26	7.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	36	5.6	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	39	5.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	21	9.5	5.0	✓	ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	14.3	5.0	✓	ALS QCS3 requirement
Total Cyanide	EK026	2	7	28.6	5.0	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	26	7.7	5.0	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	36	5.6	5.0	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	37	5.4	5.0	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	39	5.1	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)							
Ammonia as N by Discrete analyser	EK055G	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	**11.1**	**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
TPH Volatiles/BTEX	EP080	3	26	**11.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	16	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**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
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	2	16	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**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
TPH - Semivolatile Fraction	EP071	2	33	**6.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.6**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	26	**7.7**	**5.0**	✓	ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**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)
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	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)
Water Leachable Mercury by FIMS	EG035W	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. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. 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)
Total Cyanide	EK026	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 FIA. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st ed., 4500-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	SOIL	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	SOIL	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)
Semivolatile Organic Compounds	EP075	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 502)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	SOIL	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	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)

Analytical Methods	Method	Matrix	Method Descriptions
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.
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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

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.
Total Cyanide	EK026-PR	SOIL	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals in DI Water Leachate	EN25W	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Deionised Water Leach	EN60-DIa	SOIL	AS4439.3 Preparation of Leachates
Deionised Water Leach - Zero Headspace Extraction	EN60Z-DIa	SOIL	AS4439.2 Preparation of Leachates
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)
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
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.
Volatiles Water Preparation	ORG16-W	SOIL	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Preparation Methods	Method	Matrix	Method Descriptions
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 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							
EG005T: Total Metals by ICP-AES	ES1110387-015	Anonymous	**Chromium**	7440-47-3	56.7 %	0-50%	**RPD exceeds LOR based limits**

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

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
EK026: Total Cyanide							
Soil Glass Jar - Unpreserved							
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2,	BH410_7.0-7.2, BH410_23.0-23.2, QC639	20-MAY-2011	18-MAY-2011	**2**	----	----	----
Soil Glass Jar - Unpreserved							
BH410_32.0-32.2		23-MAY-2011	18-MAY-2011	**5**	----	----	----
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	23-MAY-2011	18-MAY-2011	**5**	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	23-MAY-2011	18-MAY-2011	**5**	----	----	----
EP075H: Anilines and Benzidines							

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
EP075H: Anilines and Benzidines - Analysis Holding Time Compliance						
Amber Glass Bottle - Unpreserved						
BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	23-MAY-2011	18-MAY-2011	**5**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Amber Glass Bottle - Unpreserved						
BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	23-MAY-2011	18-MAY-2011	**5**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft						
Amber Glass Bottle - Unpreserved						
BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	23-MAY-2011	18-MAY-2011	**5**	----	----	----

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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1110516**	Page	: 1 of 16
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS AMANDA LEE	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: Amanda.Lee@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 20-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Site	: ----		
		No. of samples received	: 26
Quote number	: SY/418/10 V2	No. of samples analysed	: 7

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA055-103: Moisture content was not analysed as sample was not suitable for moisture analysis.**
  Data for sampls in this work order is to be transfered from ES1110009 - DO NOT REANALYSE THESE SAMPLES. See Jenny Cullen for further instruction.
- **Data for sampls in this work order is to be transfered from ES1110009 - DO NOT REANALYSE THESE SAMPLES. See Jenny Cullen for further instruction.**
- **EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs**
- **EP080:Level of reporting raised for toluene due to ambient background levels in the laboratory.**

Analytical Results

Sub-Matrix: **ASLP ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00
				ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	<20	<20
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	<5	<5	<5	<5	<5
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**90.6**	**100**	**92.3**	**83.4**	**95.5**
Toluene-D8	2037-26-5	0.1	%	**109**	**90.1**	**106**	**99.3**	**109**
4-Bromofluorobenzene	460-00-4	0.1	%	**116**	**91.6**	**110**	**102**	**117**

Analytical Results

Sub-Matrix: **ASLP ZHE LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 20-MAY-2011 15:00	20-MAY-2011 15:00	----	----	----
				ES1110516-025	ES1110516-026	----	----	----
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	----	----	----
Toluene	108-88-3	2	µg/L	<5	<5	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**83.6**	**92.1**	----	----	----
Toluene-D8	2037-26-5	0.1	%	**98.9**	**107**	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**101**	**113**	----	----	----

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00
				ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EG020W: Water Leachable Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.003**	**0.002**	**0.003**	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	**0.0002**	**0.0004**	**0.0007**	**0.0001**	**0.0002**
Chromium	7440-47-3	0.001	mg/L	<0.001	**0.006**	**0.001**	**0.002**	<0.001
Copper	7440-50-8	0.001	mg/L	**0.003**	**0.005**	**0.017**	**0.002**	**0.002**
Lead	7439-92-1	0.001	mg/L	**0.004**	**0.005**	**0.003**	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	**0.002**	**0.003**	**0.005**	**0.008**	**0.002**
Zinc	7440-66-6	0.005	mg/L	**0.209**	**0.234**	**0.592**	**0.108**	**0.205**
EG035W: Water Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.04**	<0.01	**0.62**	<0.01	**0.01**
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	**10.7**	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	**3.8**	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	**10.3**	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	**9.4**	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	**17.6**	<1.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	**3.8**	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	**3.0**	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	**2.1**	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00	20-MAY-2011 15:00
				ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	**60.7**	<0.5	<0.5
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	<2	**4**	<2	<2
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	<50	<50	**130**	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	**580**	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	**710**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
>C10 - C16 Fraction	----	100	µg/L	<100	<100	**240**	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	**470**	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	**710**	<100	<100
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**28.3**	**28.7**	**29.9**	**29.6**	**29.3**
2-Chlorophenol-D4	93951-73-6	0.1	%	**68.3**	**73.4**	**81.9**	**67.8**	**81.9**
2.4.6-Tribromophenol	118-79-6	0.1	%	**82.8**	**99.2**	**102**	**96.2**	**97.6**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**86.8**	**97.7**	**83.0**	**86.0**	**83.9**
Anthracene-d10	1719-06-8	0.1	%	**85.5**	**96.2**	**93.8**	**90.8**	**86.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**100**	**114**	**112**	**102**	**106**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**53.1**	**64.9**	**68.8**	**72.7**	**70.4**
Phenol-d6	13127-88-3	0.1	%	**30.1**	**36.9**	**37.1**	**33.4**	**36.1**
2-Chlorophenol-D4	93951-73-6	0.1	%	**71.2**	**83.2**	**89.6**	**83.6**	**82.0**
2.4.6-Tribromophenol	118-79-6	0.1	%	**71.8**	**82.6**	**87.4**	**76.7**	**77.1**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**77.2**	**89.7**	**90.8**	**81.5**	**83.5**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**68.0**	**76.7**	**79.1**	**70.2**	**68.3**
2-Fluorobiphenyl	321-60-8	0.1	%	**88.3**	**99.3**	**103**	**91.9**	**92.3**
Anthracene-d10	1719-06-8	0.1	%	**82.3**	**93.0**	**93.8**	**87.9**	**86.6**
4-Terphenyl-d14	1718-51-0	0.1	%	**82.0**	**94.7**	**97.1**	**90.0**	**87.7**

Analytical Results

Sub-Matrix: DI WATER LEACHATE				Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	20-MAY-2011 15:00	20-MAY-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1110516-025	ES1110516-026	----	----	----
EG020W: Water Leachable Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	**0.003**	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0002**	**0.0010**	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	**0.002**	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.003**	**0.018**	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	**0.001**	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.002**	**0.005**	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.292**	**0.677**	----	----	----
EG035W: Water Leachable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	----	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**0.01**	**0.66**	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	<1.0	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	<1.0	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	<1.0	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	<2.0	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	<1.0	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	<1.0	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0	----	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L		<1.0	<1.0	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	<1.0	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	<1.0	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	**33.0**	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	**10.5**	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	**21.6**	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	**20.8**	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		**2.1**	**45.2**	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	**11.9**	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		**1.1**	**7.6**	----	----	----
Pyrene	129-00-0	1.0	µg/L		**1.0**	**5.4**	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 20-MAY-2011 15:00	20-MAY-2011 15:00	----	----	----
				ES1110516-025	ES1110516-026	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	**4.2**	**156**	----	----	----
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	**10**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction	----	50	µg/L	<50	**190**	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	**740**	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	**930**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
>C10 - C16 Fraction	----	100	µg/L	<100	**320**	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	**640**	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	**960**	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**34.2**	**34.9**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**83.7**	**82.3**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**105**	**114**	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**98.4**	**82.6**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**99.5**	**95.2**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**116**	**107**	----	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**88.7**	**81.3**	----	----	----
Phenol-d6	13127-88-3	0.1	%	**43.0**	**45.2**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**90.8**	**91.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**86.0**	**90.3**	----	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**91.9**	**92.2**	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**77.2**	**78.3**	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%	**102**	**105**	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**96.5**	**95.0**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**98.1**	**98.2**	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 10-MAY-2011 15:00	10-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	12-MAY-2011 15:00
				ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	15.5	11.9	25.2	22.4	18.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	12	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	8	19	4	3
Copper	7440-50-8	5	mg/kg	80	51	48	<5	5
Lead	7439-92-1	5	mg/kg	269	308	419	11	<5
Nickel	7440-02-0	2	mg/kg	13	7	10	<2	<2
Zinc	7440-66-6	5	mg/kg	303	301	362	23	<5
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	2.0	6.2	1.1	<0.1	<0.1
EK026: Total Cyanide								
Total Cyanide	57-12-5	1	mg/kg	<1	<1	2	<1	<1
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	9.1	8.9	8.5	8.4	7.9
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Final pH	----	0.1	pH Unit	9.1	8.9	8.5	8.4	7.9
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	2.8	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	5.2	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	4.1	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	4.8	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	24.4	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	9.7	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time: 10-MAY-2011 15:00	10-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	12-MAY-2011 15:00
				ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	**23.0**	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	**21.3**	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	**9.6**	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	**7.9**	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	**8.9**	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	**4.5**	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	**7.7**	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	**3.3**	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	**0.8**	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	**3.9**	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	**142**	<0.5	<0.5
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	**0.5**	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	**840**	**1160**	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	**290**	**660**	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	**1130**	**1820**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	**100**	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	**1000**	**1470**	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	**150**	**510**	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	**1150**	**2080**	<50	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080: BTEXN								
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID	BH410_2.0-2.2	BH410_7.0-7.2	BH410_17.0-17.5	BH410_23.0-23.2	BH410_26.0-26.2
				Client sampling date / time	10-MAY-2011 15:00	10-MAY-2011 15:00	11-MAY-2011 15:00	11-MAY-2011 15:00	12-MAY-2011 15:00
					ES1110516-003	ES1110516-006	ES1110516-010	ES1110516-016	ES1110516-019
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		89.0	89.7	90.1	92.9	97.2
2-Chlorophenol-D4	93951-73-6	0.1	%		91.8	91.3	95.0	95.2	97.1
2.4.6-Tribromophenol	118-79-6	0.1	%		69.6	80.1	98.7	80.5	100
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		103	102	105	107	106
Anthracene-d10	1719-06-8	0.1	%		112	112	103	116	118
4-Terphenyl-d14	1718-51-0	0.1	%		113	113	114	116	115
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		62.3	61.2	53.2	48.4	58.3
Phenol-d6	13127-88-3	0.1	%		62.3	57.7	62.0	60.9	59.1
2-Chlorophenol-D4	93951-73-6	0.1	%		63.0	57.3	64.1	61.4	61.3
2.4.6-Tribromophenol	118-79-6	0.1	%		59.3	58.3	63.6	58.5	57.1
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		77.0	70.8	78.5	79.4	75.6
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		70.7	64.4	73.5	74.2	69.5
2-Fluorobiphenyl	321-60-8	0.1	%		75.8	68.8	77.2	77.2	74.9
Anthracene-d10	1719-06-8	0.1	%		76.4	75.2	78.8	78.1	78.8
4-Terphenyl-d14	1718-51-0	0.1	%		79.4	76.7	82.2	83.6	83.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		112	104	96.7	99.8	94.6
Toluene-D8	2037-26-5	0.1	%		109	101	93.9	98.6	99.0
4-Bromofluorobenzene	460-00-4	0.1	%		102	97.5	90.9	96.4	98.0

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time: 12-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
				ES1110516-025	ES1110516-026	----	----	----
EA055: Moisture Content								
^ Moisture Content (dried @ 103°C)	----	1.0	%	**15.0**	**24.3**	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**17**	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**23**	**25**	----	----	----
Copper	7440-50-8	5	mg/kg	<5	**64**	----	----	----
Lead	7439-92-1	5	mg/kg	**6**	**384**	----	----	----
Nickel	7440-02-0	2	mg/kg	**5**	**10**	----	----	----
Zinc	7440-66-6	5	mg/kg	**7**	**407**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	**1.8**	----	----	----
EK026: Total Cyanide								
Total Cyanide	57-12-5	1	mg/kg	<1	**1**	----	----	----
EN60: Bottle Leaching Procedure								
Final pH	----	0.1	pH Unit	**7.8**	**8.0**	----	----	----
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Final pH	----	0.1	pH Unit	**7.8**	**8.0**	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	**2.6**	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	**5.0**	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	**4.5**	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	**4.9**	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	**24.5**	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	**8.5**	----	----	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	12-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1110516-025	ES1110516-026	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	**23.6**	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	**21.0**	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	**9.9**	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	**8.2**	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	**9.1**	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	**4.9**	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	**8.0**	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	**3.4**	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	**0.7**	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	**4.0**	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	**143**	----	----	----
EP075H: Anilines and Benzidines									
Dibenzofuran	132-64-9	0.5	mg/kg		<0.5	**4.4**	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		**22**	<10	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	**1280**	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	**710**	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	**1990**	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg		**22**	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	**130**	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	**1650**	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	**530**	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	**2310**	----	----	----
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		**16.4**	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
EP080: BTEXN									
^ Sum of BTEX	----	0.2	mg/kg		**16.4**	<0.2	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----

Analytical Results

Sub-Matrix: SOIL				Client sample ID	BH410_32.0-32.2	QC639	----	----	----
				Client sampling date / time	12-MAY-2011 15:00	11-MAY-2011 15:00	----	----	----
Compound	CAS Number	LOR	Unit		ES1110516-025	ES1110516-026	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		90.9	90.0	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		93.0	94.1	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		80.2	98.6	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		106	106	----	----	----
Anthracene-d10	1719-06-8	0.1	%		111	106	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		114	114	----	----	----
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		56.4	41.1	----	----	----
Phenol-d6	13127-88-3	0.1	%		64.2	72.7	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		66.9	74.0	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		60.4	73.3	----	----	----
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		81.3	95.9	----	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		76.2	86.6	----	----	----
2-Fluorobiphenyl	321-60-8	0.1	%		79.6	87.4	----	----	----
Anthracene-d10	1719-06-8	0.1	%		83.2	89.9	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		83.8	96.3	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		103	101	----	----	----
Toluene-D8	2037-26-5	0.1	%		96.6	103	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		82.7	97.2	----	----	----

Surrogate Control Limits

Sub-Matrix: **ASLP ZHE LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Sub-Matrix: **DI WATER LEACHATE**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	116.6
Phenol-d6	13127-88-3	10.0	69.0
2-Chlorophenol-D4	93951-73-6	20.9	129.7
2.4.6-Tribromophenol	118-79-6	10.0	150.7
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29.4	141.7
1.2-Dichlorobenzene-D4	2199-69-1	23.6	120.7
2-Fluorobiphenyl	321-60-8	27.2	134.9
Anthracene-d10	1719-06-8	29.7	140.7
4-Terphenyl-d14	1718-51-0	27.6	143.6

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	147.0

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075S: Acid Extractable Surrogates - Continued			
Phenol-d6	13127-88-3	12.5	110.6
2-Chlorophenol-D4	93951-73-6	10.0	116.8
2.4.6-Tribromophenol	118-79-6	10.0	120.1
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	13.3	124.5
1.2-Dichlorobenzene-D4	2199-69-1	11.9	103.9
2-Fluorobiphenyl	321-60-8	11.3	126.1
Anthracene-d10	1719-06-8	13.1	128.1
4-Terphenyl-d14	1718-51-0	10.0	134.7
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

23/5/11

BATCH SPLIT FROM ES1110009 - Data from ES1110009 to be transferred into this batch

Page 1 of 3

Form: Results to Amanda Lee.

AECOM

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 3954040405

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filtered	acid	Ice	other	Container (No. & type)	Soil - S-26	8 metals/TPH/BTEX/PAH	HOLD	WATER - W-26	TPH/BTEX/PAH/Phenols	Soil - TPH/BTEX
1	BH410_0.2-0.4		10.5.11	x					x		Jar			x			
2	BH410_1.2-1.4			x										x			
3	BH410_2.0-2.2			x									✓	3 x			
4	BH410_4.0-4.1			x										x			
5	BH410_5.0-5.1			x										x			
6	BH410_7.0-7.2			x									✓	x			
7	BH410_11.0-11.2			x										x			
8	BH410_13.0-13.2		12.5.11	x										x			
9	BH410_15.0-15.2			x										x			
10	BH410_17.0-17.5			x									✓	x			

Environmental Division
Sydney
Work Order
ES1110516
Telephone : +61-2-8784 8555

Remarks & comments:
Metals: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn
Please contact Kate O'Brien for details of Samples to be analysed as per attached email.
WS 13/5 1510

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment ☐ Courier ☑ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12.5.11	Name: W. SAGEH Date: 12/5	Samples received chilled?	Yes/No/NA Lab / A	Consignment Note No.s: Labmark
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA Organ	Transport Co: Date:
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W. SAGEH UPDATED COC Date: 13/5	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: Time:	of: ALS Time: 1510		Yes/No/NA Attach	Transport Co: By PO / Internal Sheet:

Printed copies of this document are uncontrolled

Environment

Revision: Oct 08

BMS-PM-DV-F046

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 87354555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 395406US

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8752

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filtered	acid	Ice	other	Container (No. & type)	Soil - S-26	8 metals/TPH/BTEX/PAH	PAH	HOLD	WATER - W-26	TPH/BTEX/PAH/8 metals	Soil - TPH/BTEX	Remarks & comments
11	BH410_18.0-18.2	11.5.11		x					x		Jar				x				Metals: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn
12	BH410_19.0-19.2	↓		x					x		↓				x				
13	BH410_20.0-20.2			x					x						x				
14	BH410_21.0-21.2			x					x						x				
15	BH410_22.0-22.2			x					x						x				
16	BH410_23.0-23.2			x					x				✓		x				
17	BH410_24.0-24.2			x					x						x				
18	BH410_25.0-25.2	↓		x					x						x				
19	BH410_26.0-26.2	12.5.11		x					x						x				
20	BH410_27.0-27.2	↓		x					x		↓				x				Please contact Kate O'Brien for details & samples to be analysed

Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12.5.11	Name: W. SALEH Date: 12/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W. SALEH UPDATED COC Date: 13/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: ALS Time: 1510		Yes/No/NA	Transport Co:	

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Form:

AECOM

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6·1 **Purchase Order Number:** 3915401405

Sample collected by: **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: Soil – S-26	Analysis Request: 8 metals/TPH/BTEX/PAH	Analysis Request: HOLD	Analysis Request: Water – W-26	Analysis Request: TPH/BTEX/PAH	Analysis Request: metals	Analysis Request: SPLP/TCLP – TCLP	Remarks & comments
21	BH410_28.0-28.1		12·5·11	X					X		Jar			X					Please contact Kate O'Brien for details of samples to be analysed
22	BH410_29.0-29.2		↓	X					X		↓			X					
23	BH410_30.0-30.2			X					X					X					
24	BH410_31.0-31.2			X					X					X					
25	BH410_32.0-32.2		↓	X					X				✓	X					
26	QC639		11.5.11	X					X				✓	X					
27	QC640		11·5·11	X					X		↓			X					SEND TO MAT/LABMAKER
28	QC638	10.5.11		X	X				X		2V, 1A, 1P					X	X		
29	QC641	11·5·11			X				X							X	X		
30	QC642	12·5·11			X				X		↓					X	X		

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12·5·11	Name: W-SAGH Date: 12/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	**Received in good condition?**	**Yes/No/NA**	**Method of Shipment**	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W-SAGH UPDATED COC Date: 13/5	**Samples received chilled?**	**Yes/No/NA**	**Consignment Note No.**	
of: Time:	of: ALS Time: 1210		Yes/No/NA	Transport Co:	

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Environment

Wael Saleh

From: McGrath, Kate [Kate.McGrath@aecom.com]
Sent: Tuesday, 17 May 2011 2:42 PM
To: Wael Saleh
Cc: Jennifer Cullen
Subject: Additional analysis
Attachments: ES1110009_SRN.pdf

Hi Wael

Could I please get BH410_26-26.2 analysed for 8 Metals, TPH, BTEX and PAHs as well

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
mailto:Kate.McGrath@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072 P.O. Box PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
http://www.aecom.com

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-----Original Message-----
From: McGrath, Kate
Sent: Friday, May 13, 2011 3:10 PM
To: 'Wael Saleh'
Subject: RE: Scan Data from FX-B0F5F3

Hi Wael

Could I please get the following samples analysed for 8 Metals, TPH, BTEX and PAHs

BH410_2.0-2.2
BH410_7.0-7.2
BH410_17.0-17.5
BH410_23.0-23.2
BH410_32.0-32.2
QC639

Please send QC640 to MGT Labmark Lane Cove for analysis

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
mailto:Kate.McGrath@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072 P.O. Box PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
http://www.aecom.com

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-----Original Message-----
From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Friday, May 13, 2011 1:53 PM
To: McGrath, Kate
Subject: FW: Scan Data from FX-B0F5F3
Importance: High

Hi Kate,

Please see attached file. Samples received yesterday afternoon.

Could you please instruct on the analysis required for these samples.

Thanks

How was your customer experience? Please send us your feedback

Wael Saleh
Creation/Committal Coordinator

ALS Environmental

277 Woodpark Road
Smithfield, NSW, 2164

Direct: +61 2 8784 8513
Phone: +61 2 8784 8555
Fax: +61 2 8784 8500
Email: wael.saleh@alsglobal.com

-----Original Message-----
From: alssmlp006 [mailto:alssmlp006@alsglobal.com]
Sent: Friday, 13 May 2011 1:52 PM
To: Wael Saleh
Subject: Scan Data from FX-B0F5F3

Number of Images: 3
Attachment File Type: PDF

Device Name: alssmlp006
Device Location:

****
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23/5/11

BATCH SPLIT FROM ES1110009 - Data from ES1110009 to be transferred into this batch

Page 1 of 3

Form: Results to Amanda Lee.

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Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 3954040US

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: fil'ed	acid	ice	other	Container (No. & type)	Soil - S-26	8 metals/TPH/BTEX/PAH	HOLD	WATER - As-26	TPH/BTEX/PAH/2 metals	Soil - TPH/BTEX/PAH/2 metals	Remarks & comments
1	BH410_0.2-0.4		10.5.11	x					x		Jar			x				Metals: As, Cd, Cu, Cr, Ni, Pb, Hg, Zn
2	BH410_1.2-1.4			x										x				
3	BH410_2.0-2.2			x									✓ 3	✓				
4	BH410_4.0-4.1			x										x				Please contact Kate O'Brien for details of Sampler to be analysed As per attached email. WS 13/5 1510
5	BH410_5.0-5.1			x										x				
6	BH410_7.0-7.2			x									✓	✓				
7	BH410_11.0-11.2		↓	x										x				
8	BH410_13.0-13.2		13.5.11	x										x				
9	BH410_15.0-15.2		↓	x										x				
10	BH410_17.0-17.5		↓	x									✓	✓				

Environmental Division Sydney
Work Order
ES1110516
Telephone : +61-2-8784 8555

Relinquished By:
Name: Dirk Sanderson Date: 12.5.11
of: AECOM Time: 14:00

Received by:
Name: W. SAGEL Date: 12/5
of: ALS Time: 1800

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: W. SAGEL UPDATED COC Date: 13/5
of: ALS Time: 1510

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

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Chain of Custody & Analysis Request Form

COC # 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 30540AUS

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony Davis / Kate McGrath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	Ice	other	Container (No. & type)	Analysis Request: Soil - 5-26	8 metals + TPH / BTEX / PAH	HOLD	water - 4-26	TPH / BTEX / PAH / 12 metals	Soil - TPH / BTEX	Remarks & comments
11	BH410_18.0-18.2	11.5.11		x					x		Jar			x				Please contact
12	BH410_19.0-19.2	↓		x					x		↓			x				Kate O'Brien for
13	BH410_20.0-20.2			x					x					x				details & samples
14	BH410_21.0-21.2			x					x					x				to be analysed.
15	BH410_22.0-22.2			x					x					x				
16	BH410_23.0-23.2			x					x				✓	x				
17	BH410_24.0-24.2			x					x					x				
18	BH410_25.0-25.2	↓		x					x					x				
19	BH410_26.0-26.2	12.5.11		x					x					x				
20	BH410_27.0-27.2	↓		x					x		↓			x				

Relinquished By:
Name: Dirk Sanderson Date: 12.5.11
of: AECOM Time: 14:00

Received by:
Name: W. SALEH Date: 12/5
of: ALS Time: 1800

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: W-SALEH UPDATED COC Date: 18/5
of: ALS Time: 1510

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

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Form:

AECOM

Chain of Custody & Analysis Request Form

COC # /

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: BARANGAROO **Project Number:** 60153531 / 6.1 **Purchase Order Number:** 3954004US

Sample collected by: **Sample Results to be returned to:** Anthony Davis / Kate McBeath

Specifications: ESDAT

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A
7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952			

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Soil - As-26	8 metals/TPH/BTEX/PAH	PAH	HOLD	Leaves - As-26	TPH/BTEX/PAH/8 metals	Soil - TPH/BTEX	Remarks & comments
21	BH410_28.0-28.1	12.5.11		X					X		Jar				X				Please contact Kate O'Brien for details of samples to be analysed
22	BH410_29.0-29.2			X					X						X				
23	BH410_30.0-30.2			X					X						X				
24	BH410_31.0-31.2			X					X						X				
25	BH410_32.0-32.2			X					X				✓		X				
26	QC639		11.5.11	X					X				✓		X				
27	QC640		11.5.11	X					X						X				SEND TO MAT/LABMAPLE
28	QC638	10.5.11		X	X				X		2V, 1A, 1P						X	X	
29	QC641	11.5.11			X				X								X	X	
30	QC642	12.5.11			X				X								X	X	

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Dirk Sanderson Date: 12.5.11	Name: W-SALEH Date: 12/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: AECOM Time: 14:00	of: ALS Time: 1800		Yes/No/NA	Transport Co:	
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Name: Date:	Name: W-SALEH UPDATED COC Date: 13/5	Samples received chilled?	Yes/No/NA	Consignment Note No.	
of: Time:	of: ALS Time: 1210		Yes/No/NA	Transport Co:	

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Wael Saleh

From: McGrath, Kate [Kate.McGrath@aecom.com]
Sent: Tuesday, 17 May 2011 2:42 PM
To: Wael Saleh
Cc: Jennifer Cullen
Subject: Additional analysis
Attachments: ES1110009_SRN.pdf

Hi Wael

Could I please get BH410_26-26.2 analysed for 8 Metals, TPH, BTEX and PAHs as well

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
mailto:Kate.McGrath@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072 P.O. Box PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
http://www.aecom.com

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-----Original Message-----
From: McGrath, Kate
Sent: Friday, May 13, 2011 3:10 PM
To: 'Wael Saleh'
Subject: RE: Scan Data from FX-B0F5F3

Hi Wael

Could I please get the following samples analysed for 8 Metals, TPH, BTEX and PAHs

BH410_2.0-2.2
BH410_7.0-7.2
BH410_17.0-17.5
BH410_23.0-23.2
BH410_32.0-32.2
QC639

Please send QC640 to MGT Labmark Lane Cove for analysis

Regards

Kate McGrath
Professional Scientist
D +61 2 8484 8939
mailto:Kate.McGrath@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072 P.O. Box PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
http://www.aecom.com

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-----Original Message-----
From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Friday, May 13, 2011 1:53 PM
To: McGrath, Kate
Subject: FW: Scan Data from FX-B0F5F3
Importance: High

Hi Kate,

Please see attached file. Samples received yesterday afternoon.

Could you please instruct on the analysis required for these samples.

Thanks

How was your customer experience? Please send us your feedback

Wael Saleh
Creation/Committal Coordinator

ALS Environmental

277 Woodpark Road
Smithfield, NSW, 2164

Direct: +61 2 8784 8513
Phone: +61 2 8784 8555
Fax: +61 2 8784 8500
Email: wael.saleh@alsglobal.com

-----Original Message-----
From: alssmlp006 [mailto:alssmlp006@alsglobal.com]
Sent: Friday, 13 May 2011 1:52 PM
To: Wael Saleh
Subject: Scan Data from FX-B0F5F3

Number of Images: 3
Attachment File Type: PDF

Device Name: alssmlp006
Device Location:

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Jennifer Cullen

From: Lee, Amanda [Amanda.Lee@aecom.com]
Sent: Friday, 20 May 2011 9:36 AM
To: Lee, Amanda; Jennifer Cullen
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Jennifer

As discussed please see my edited request for analysis.

Please only analyse samples from ES1110009 which have previously been selected for analysis by Kate. Please disregard request for analysis for batches.

For samples in work **order ES1110009 we** should be able to work with the volumes we have. Could you please confirm whether the additional analysis must be added to all samples including those that are on hold or only those where analysis has already been requested? **As discussed only samples where analysis has already been requested.**

To confirm- We will need the following volumes of soil to conduct the testing required:

50g - Semivolatile ASLP leach for Ammonia, Dibenzofuran, Metals, svTPH, and PAH/Phenols

20g – volatile ASLP leach for Cyanide, BTEX, vTPH (This can not be scaled back due to ZHE requirements)

20g - Dibenzofuran

10g – Cyanide

40g – for moisture, TPH, BTEX, Metals, PAH (parameters already requested in work order ES1110009)- please add phenol analysis to this request for me.

Please send through cost estimate and SRA asap.

Amanda Lee
Associate Director - Environment
D +61 2 8295 4331 M +61 417 755 407
Amanda.Lee@aecom.com

AECOM
Level 11, 44 Market Street, Sydney, NSW 2000
Q410, QVB Post Office, Sydney, NSW, 1230
T +61 2 8295 4331 F +61 2 8023 9399
www.aecom.com

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From: Lee, Amanda
Sent: Thursday, 19 May 2011 6:33 PM
To: Jennifer Cullen
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Jennifer

Can you please give me ballpark analytical costs to complete the additional testing I have requested? I need this by tomorrow am.

Many thanks

Amanda Lee
Associate Director - Environment
D +61 2 8295 4331 M +61 417 755 407
Amanda.Lee@aecom.com

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Q410, QVB Post Office, Sydney, NSW, 1230
T +61 2 8295 4331 F +61 2 8023 9399
www.aecom.com

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From: Jennifer Cullen [mailto:Jennifer.Cullen@alsglobal.com]
Sent: Thursday, 19 May 2011 11:08 AM
To: Lee, Amanda; Glenyss Weeks; Hansen, Catherine
Cc: McGrath, Kate; Davis, Anthony
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Amanda,

We have located all of the jars from work orders ES1107357 and ES1108140 and it looks as though we should have enough volume to perform analysis using a scaled back Semivolatile ASLP leach as described below. I have arranged for these samples to be rebatched for the required analysis on only the samples that were previously analysed.

We will let you know if we run into any problems with the limited volume available.

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen

CLIENT SERVICES COORDINATOR

ALS | Environmental Division

Address

277-289 Woodpark Road, Smithfield, NSW, 2164

PHONE +61 2 8784 8555

DIRECT +61 2 8784 8509

FAX +61 2 8784 8500

www.alsglobal.com

P *Please consider the environment before printing this email.*

From: Lee, Amanda [mailto:Amanda.Lee@aecom.com]
Sent: Wednesday, 18 May 2011 5:54 PM
To: Jennifer Cullen; Glenyss Weeks; Hansen, Catherine
Cc: McGrath, Kate; Davis, Anthony
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Jennifer

At the present time, please only include samples where we have requested analysis.

I will get back to you with potential analysis on the "on hold" samples.

Thanks

Amanda Lee
Associate Director - Environment
D +61 2 8295 4331 M +61 417 755 407
Amanda.Lee@aecom.com

AECOM
Level 11, 44 Market Street, Sydney, NSW 2000
Q410, QVB Post Office, Sydney, NSW, 1230
T +61 2 8295 4331 F +61 2 8023 9399
www.aecom.com

Please consider the environment before printing this email.
.-. -.. -

From: Jennifer Cullen [mailto:Jennifer.Cullen@alsglobal.com]
Sent: Wednesday, 18 May 2011 5:03 PM
To: Lee, Amanda; Glenyss Weeks; Hansen, Catherine
Cc: McGrath, Kate; Davis, Anthony
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Amanda,

I have spoken with the lab and we should be able to scale back the ASLP leach for semi volatiles to 50g of soil from 100g. This shouldn't affect LORs however it is not ideal as it can create heterogeneity issues.

For samples in work **order ES1110009 we** should be able to work with the volumes we have. Could you please confirm whether the additional analysis must be added to all samples including those that are on hold or only those where analysis has already been requested?

We will need the following volumes of soil to conduct the testing required:

50g - Semivolatile ASLP leach for Ammonia, Dibenzofuran, Metals, svTPH, and PAH/Phenols

20g – volatile ASLP leach for Cyanide, BTEX, vTPH (This can not be scaled back due to ZHE requirements)

20g - Dibenzofuran

10g – Cyanide

40g – for moisture, TPH, BTEX, Metals, PAH (parameters already requested in work order ES1110009)

For work order ES1107354 and ES1108140 we will need at least:

50g - Semivolatile ASLP leach for Ammonia, Dibenzofuran, Metals, svTPH, and PAH/Phenols

20g – volatile ASLP leach for Cyanide, BTEX, vTPH (This can not be scaled back due to ZHE requirements)

20g - Dibenzofuran

10g – Cyanide

We are currently locating the jars from these work orders to work out how much volume we have remaining for each sample and will confirm this with you before proceeding as it is unlikely that we will have enough left from the initial round of analysis.

Thanks

How was your customer experience? Please send us your feedback

Kind Regards

Jennifer Cullen

CLIENT SERVICES COORDINATOR

ALS | Environmental Division

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P *Please consider the environment before printing this email.*

From: Lee, Amanda [mailto:Amanda.Lee@aecom.com]
Sent: Wednesday, 18 May 2011 4:03 PM
To: Glenyss Weeks; Hansen, Catherine
Cc: McGrath, Kate; Davis, Anthony; Jennifer Cullen

Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Glenyss,

Can you please outline how a reduced sample volume will affect the leach LORS? We may proceed anyway with elevated LORS if I can get an idea of how significant they may be?

Many thanks

Amanda.

Amanda Lee
Associate Director - Environment
D +61 2 8295 4331 M +61 417 755 407
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From: Glenyss Weeks [mailto:Glenyss.Weeks@ALSGlobal.com]
Sent: Wednesday, 18 May 2011 3:54 PM
To: Hansen, Catherine
Cc: Lee, Amanda; McGrath, Kate; Davis, Anthony; Jennifer Cullen
Subject: RE: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hello Catherine,

I've done a quick look into the volumes of these work orders. Unfortunately volume limitations may apply as only 1x150mL Soil Jars were received for each soil sample. We require 100g of soil for ASLP alone. Jennifer will be in touch with you shortly regarding your options for additional analysis on these samples. In order to avoid volume limitations I would recommend sending at minimum 1x250mL Soil jar per sample. If a leachate is a consideration in your project at any time then I would recommend 2x250mL Soil jars. I know that it is not always possible to know of additional analysis

you may request in the future but this may save you from having to re-sample or not being able to get all of the necessary analyses.

We will update your job number as requested.

Kind Regards,

Glenyss

How was your customer experience? Please send us your feedback

Glenyss Weeks

Senior Project Manager

ALS | Environmental Division

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P Please consider the environment before printing this email

From: Hansen, Catherine [mailto:Catherine.Hansen@aecom.com]
Sent: Wednesday, 18 May 2011 3:08 PM
To: Glenyss Weeks

Cc: Lee, Amanda; McGrath, Kate; Davis, Anthony
Subject: Additional analysis for batches ES1107354, ES1108140, ES1110009

Hi Glenyss,

Further to the correspondence you have received from Garry Smith and Kate McGrath regarding batches ES1107354, ES1108140, ES1110009, could you please include the following analyses:

Dibenzofuran for all soil samples

Cyanide for all soil samples, and

ASLP for Ammonia, Dibenzofuran, Cyanide, Metals, BTEX, TPH, and PAH/Phenols for all soil samples

Please note the following job number on the invoice 60153531 1.S4150086

Regards,

Catherine Hansen
Environmental Scientist
D +61 2 8484 8940
Catherine.Hansen@aecom.com

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1110516**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS AMANDA LEE	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: Amanda.Lee@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 26
Quote number	: SY/418/10 V2	No. of samples analysed	: 7

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
WORLD RECOGNISED ACCREDITATION

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney 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: 1799696)									
ES1110516-003	BH410_2.0-2.2	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	15.5	15.5	0.0	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 1797141)									
ES1110516-006	BH410_7.0-7.2	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	10	28.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	7	10	43.3	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	51	63	21.4	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	308	282	9.0	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	301	279	7.6	0% - 20%
EK026: Total Cyanide (QC Lot: 1801774)									
ES1110516-003	BH410_2.0-2.2	EK026: Total Cyanide	57-12-5	1	mg/kg	<1	<1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 1797099)									
ES1110516-019	BH410_26.0-26.2	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: 1797099)									
ES1110516-019	BH410_26.0-26.2	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	<0.5	<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

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: 1797099) - continued									
ES1110516-019	BH410_26.0-26.2	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
EP075H: Anilines and Benzidines (QC Lot: 1797097)									
ES1110516-016	BH410_23.0-23.2	EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1796966)									
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1797098)									
ES1110516-019	BH410_26.0-26.2	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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1796966)									
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1797098)									
ES1110516-019	BH410_26.0-26.2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 1796966)									
ES1110516-003	BH410_2.0-2.2	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: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020W: Water Leachable Metals by ICP-MS (QC Lot: 1801125)									
ES1110516-003	BH410_2.0-2.2	EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	0.0	No Limit
		EG020A-W: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-W: Copper	7440-50-8	0.001	mg/L	0.003	0.004	0.0	No Limit
		EG020A-W: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-W: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-W: Zinc	7440-66-6	0.005	mg/L	0.209	0.220	5.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035W: Water Leachable Mercury by FIMS (QC Lot: 1801445)									
ES1110516-003	BH410_2.0-2.2	EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK026G: Total Cyanide By Discrete Analyser (QC Lot: 1801013)									
ES1110516-003	BH410_2.0-2.2	EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1801028)									
ES1110516-003	BH410_2.0-2.2	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.05	28.6	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1800412)									
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1800412)									
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1800412)									
ES1110516-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control 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: 1797141)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	13.11 mg/kg	118	70	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	2.76 mg/kg	90.6	83.3	111
EG005T: Chromium	7440-47-3	2	mg/kg	<2	60.93 mg/kg	100	89.2	117
EG005T: Copper	7440-50-8	5	mg/kg	<5	54.68 mg/kg	95.1	90.1	114
EG005T: Lead	7439-92-1	5	mg/kg	<5	54.76 mg/kg	100	85.2	111
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.23 mg/kg	102	88.3	116
EG005T: Zinc	7440-66-6	5	mg/kg	<5	103.88 mg/kg	93.4	88.9	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1797142)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	1.4 mg/kg	78.6	67	118
EK026: Total Cyanide (QCLot: 1801774)								
EK026: Total Cyanide	57-12-5	1.0	mg/kg	<1	20.0 mg/kg	93.6	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1797099)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	81.5	73.9	115
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	80.3	80.2	115
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	92.2	76.8	114
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	8 mg/kg	83.2	72	119
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	80.5	60.3	117
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	80.7	74.5	119
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	78.6	71.6	113
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	91.6	74.8	115
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	90.0	76.4	114
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	85.7	62.2	115
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	92.4	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1.0	8 mg/kg	21.4	1.23	91.6
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1797099)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	89.4	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	94.4	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	99.5	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	96.0	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	87.2	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	92.7	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	88.9	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	89.1	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	85.0	77.2	112

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1797099) - continued								
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	101	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	88.4	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	83.2	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	93.9	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	82.1	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	84.2	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	91.5	72.4	114
EP075H: Anilines and Benzidines (QCLot: 1797097)								
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.25 mg/kg	93.0	60.2	111
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1796966)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	104	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1797098)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	121	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	102	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1796966)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	103	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1797098)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	107	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	115	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	77.3	63	131
EP080: BTEXN (QCLot: 1796966)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	73.5	63	121
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	119	69	122
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	79.1	61	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	85.5	62	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	78.7	63	117
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	85.1	63	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1801125)								
EG020A-W: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	87	111
EG020A-W: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	90	106
EG020A-W: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	94	114
EG020A-W: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	105	90	112

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1801125) - continued								
EG020A-W: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	88	120
EG020A-W: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	86	116
EG020A-W: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	82	116
EG035W: Water Leachable Mercury by FIMS (QCLot: 1801445)								
EG035W: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.5	82	118
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1801013)								
EK026G: Total Cyanide	57-12-5	0.004	mg/L	<0.004	0.2 mg/L	98.4	70	112
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1801028)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	108	79.6	122
EP075(SIM)A: Phenolic Compounds (QCLot: 1800536)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	2 µg/L	48.2	24.5	61.9
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	2 µg/L	84.0	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	2 µg/L	84.6	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	4 µg/L	70.5	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	2 µg/L	82.3	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	2 µg/L	81.5	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	2 µg/L	81.4	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	2 µg/L	80.3	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	2 µg/L	82.4	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	2 µg/L	89.1	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	2 µg/L	96.1	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	4 µg/L	34.8	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800536)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	2 µg/L	84.4	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	2 µg/L	86.6	63.6	114
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800536) - continued								
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	2 µg/L	88.7	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	2 µg/L	88.8	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	2 µg/L	93.6	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	2 µg/L	91.4	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	2 µg/L	89.7	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	2 µg/L	92.8	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	2 µg/L	96.7	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	2 µg/L	94.3	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	2 µg/L	82.5	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	2 µg/L	100	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	2 µg/L	101	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	2 µg/L	83.7	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	2 µg/L	83.3	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	2 µg/L	83.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP075H: Anilines and Benzidines (QCLot: 1800534)								
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	5 µg/L	67.0	65.3	108
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800412)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	82.6	75	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800535)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	116	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	131	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	92.5	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800412)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	83.0	75	127

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 Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800535)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	114	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	117	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	97.3	62.7	131
EP080: BTEXN (QCLot: 1800412)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	94.8	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	87.3	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	86.3	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	86.3	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	87.2	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	87.8	72.9	127

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: 1797141)							
ES1110516-019	BH410_26.0-26.2	EG005T: Arsenic	7440-38-2	50 mg/kg	95.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.0	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	96.0	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	104	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	98.0	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	93.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1797142)							
ES1110516-019	BH410_26.0-26.2	EG035T: Mercury	7439-97-6	5 mg/kg	106	70	130
EK026: Total Cyanide (QCLot: 1801774)							
ES1110516-003	BH410_2.0-2.2	EK026: Total Cyanide	57-12-5	20.0 mg/kg	89.6	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 1797099)							
ES1110516-019	BH410_26.0-26.2	EP075(SIM): Phenol	108-95-2	10 mg/kg	82.7	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	82.8	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	85.2	60	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	79.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	41.7	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1797099)							
ES1110516-019	BH410_26.0-26.2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.8	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	97.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1796966)							
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	90.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1797098)							
ES1110516-019	BH410_26.0-26.2	EP071: C10 - C14 Fraction	----	640 mg/kg	106	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	85.6	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1796966)							
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	37.5 mg/kg	91.6	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1797098)							
ES1110516-019	BH410_26.0-26.2	EP071: >C10 - C16 Fraction	----	850 mg/kg	114	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	95.4	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	66.7	52	132
EP080: BTEXN (QCLot: 1796966)							

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
EP080: BTEXN (QCLot: 1796966) - continued							
ES1110516-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	2.5 mg/kg	74.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	83.1	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	85.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	84.9	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	87.6	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
EG020W: Water Leachable Metals by ICP-MS (QCLot: 1801125)							
ES1110516-003	BH410_2.0-2.2	EG020A-W: Arsenic	7440-38-2	1 mg/L	107	70	130
		EG020A-W: Cadmium	7440-43-9	0.250 mg/L	106	70	130
		EG020A-W: Chromium	7440-47-3	1 mg/L	108	70	130
		EG020A-W: Copper	7440-50-8	1 mg/L	110	70	130
		EG020A-W: Lead	7439-92-1	1 mg/L	106	70	130
		EG020A-W: Nickel	7440-02-0	1 mg/L	104	70	130
		EG020A-W: Zinc	7440-66-6	1 mg/L	112	70	130
EG035W: Water Leachable Mercury by FIMS (QCLot: 1801445)							
ES1110516-006	BH410_7.0-7.2	EG035W: Mercury	7439-97-6	0.0100 mg/L	106	70	130
EK026G: Total Cyanide By Discrete Analyser (QCLot: 1801013)							
ES1110516-003	BH410_2.0-2.2	EK026G: Total Cyanide	57-12-5	0.2 mg/L	105	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1801028)							
ES1110516-003	BH410_2.0-2.2	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	109	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800412)							
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C9 Fraction	----	325 µg/L	96.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800412)							
ES1110516-003	BH410_2.0-2.2	EP080: C6 - C10 Fraction	----	375 µg/L	94.2	70	130
EP080: BTEXN (QCLot: 1800412)							
ES1110516-003	BH410_2.0-2.2	EP080: Benzene	71-43-2	25 µg/L	90.6	70	130
		EP080: Toluene	108-88-3	25 µg/L	90.2	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	93.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	93.9	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	96.9	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	89.3	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1110516**	Page	: 1 of 12
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS AMANDA LEE	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Project	: 60153531 6 1 Barangaroo	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-MAY-2011
Sampler	: DS	Issue Date	: 29-MAY-2011
Order number	: 39540AUS	No. of samples received	: 26
Quote number	: SY/418/10 V2	No. of samples analysed	: 7

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								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**----**	----	----	**24-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**----**	----	----	**24-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**----**	----	----	**24-MAY-2011**	26-MAY-2011	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**20-MAY-2011**	06-NOV-2011	✓	**24-MAY-2011**	06-NOV-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**20-MAY-2011**	07-NOV-2011	✓	**24-MAY-2011**	07-NOV-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**20-MAY-2011**	08-NOV-2011	✓	**24-MAY-2011**	08-NOV-2011	✓
EG020W: Water Leachable Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**24-MAY-2011**	16-NOV-2011	✓	**25-MAY-2011**	16-NOV-2011	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**20-MAY-2011**	07-JUN-2011	✓	**20-MAY-2011**	07-JUN-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**20-MAY-2011**	08-JUN-2011	✓	**20-MAY-2011**	08-JUN-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**20-MAY-2011**	09-JUN-2011	✓	**20-MAY-2011**	09-JUN-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
EG035W: Water Leachable Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Unfiltered								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**---**	----	----	**27-MAY-2011**	17-JUN-2011	✓
EK026: Total Cyanide								
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**24-MAY-2011**	17-MAY-2011	×	**24-MAY-2011**	07-JUN-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**24-MAY-2011**	18-MAY-2011	×	**24-MAY-2011**	07-JUN-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**24-MAY-2011**	19-MAY-2011	×	**24-MAY-2011**	07-JUN-2011	✓
EK026G: Total Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**24-MAY-2011**	03-JUN-2011	✓	**24-MAY-2011**	03-JUN-2011	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**---**	17-JUN-2011	----	**24-MAY-2011**	17-JUN-2011	✓
EN60: Bottle Leaching Procedure								
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**---**	24-MAY-2011	----	**24-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**---**	25-MAY-2011	----	**24-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**---**	26-MAY-2011	----	**24-MAY-2011**	26-MAY-2011	✓
EN60Z-DI: Deionised Water Leach (Zero Headspace Extraction)								
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**---**	24-MAY-2011	----	**23-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**---**	25-MAY-2011	----	**23-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**---**	26-MAY-2011	----	**23-MAY-2011**	26-MAY-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								
Amber Glass Bottle - Unpreserved								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**23-MAY-2011**	27-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**17-MAY-2011**	24-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**17-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**23-MAY-2011**	27-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**17-MAY-2011**	24-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**17-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
EP075H: Anilines and Benzidines								
Amber Glass Bottle - Unpreserved								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**23-MAY-2011**	27-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**19-MAY-2011**	24-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**19-MAY-2011**	25-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**19-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	03-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
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**23-MAY-2011**	27-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl								
BH410_2.0-2.2, BH410_17.0-17.5, BH410_26.0-26.2, QC639	BH410_7.0-7.2, BH410_23.0-23.2, BH410_32.0-32.2,	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**23-MAY-2011**	03-JUN-2011	✓
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**16-MAY-2011**	24-MAY-2011	✓	**16-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_2.0-2.2,	BH410_7.0-7.2	**10-MAY-2011**	**17-MAY-2011**	24-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**16-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_17.0-17.5, QC639	BH410_23.0-23.2,	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**16-MAY-2011**	26-MAY-2011	✓	**16-MAY-2011**	26-MAY-2011	✓
Soil Glass Jar - Unpreserved								
BH410_26.0-26.2,	BH410_32.0-32.2	**12-MAY-2011**	**17-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	03-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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**20-MAY-2011**	**23-MAY-2011**	27-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**23-MAY-2011**	03-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2	**10-MAY-2011**	**16-MAY-2011**	24-MAY-2011	✓	**16-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2	**10-MAY-2011**	**17-MAY-2011**	24-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved BH410_17.0-17.5, BH410_23.0-23.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**16-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_17.0-17.5, BH410_23.0-23.2, QC639	**11-MAY-2011**	**17-MAY-2011**	25-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2, BH410_32.0-32.2	**12-MAY-2011**	**16-MAY-2011**	26-MAY-2011	✓	**16-MAY-2011**	26-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2, BH410_32.0-32.2	**12-MAY-2011**	**17-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	03-JUL-2011	✓
EP080: BTEX							
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2	**10-MAY-2011**	**16-MAY-2011**	24-MAY-2011	✓	**16-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_17.0-17.5, BH410_23.0-23.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**16-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2, BH410_32.0-32.2	**12-MAY-2011**	**16-MAY-2011**	26-MAY-2011	✓	**16-MAY-2011**	26-MAY-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: BTEXN							
Amber VOC Vial - HCl BH410_2.0-2.2, BH410_7.0-7.2, BH410_17.0-17.5, BH410_23.0-23.2, BH410_26.0-26.2, BH410_32.0-32.2, QC639	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**23-MAY-2011**	03-JUN-2011	✓
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2	**10-MAY-2011**	**16-MAY-2011**	24-MAY-2011	✓	**16-MAY-2011**	24-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_17.0-17.5, BH410_23.0-23.2, QC639	**11-MAY-2011**	**16-MAY-2011**	25-MAY-2011	✓	**16-MAY-2011**	25-MAY-2011	✓
Soil Glass Jar - Unpreserved BH410_26.0-26.2, BH410_32.0-32.2	**12-MAY-2011**	**16-MAY-2011**	26-MAY-2011	✓	**16-MAY-2011**	26-MAY-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	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide	EK026	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide	EK026	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**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)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP) - Continued							
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Total Cyanide By Discrete Analyser	EK026G	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Water Leachable Mercury by FIMS	EG035W	1	7	**14.3**	**5.0**	✓	ALS QCS3 requirement
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	1	7	**14.3**	**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)
Water Leachable Metals by ICP-MS - Suite A	EG020A-W	SOIL	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	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)
Water Leachable Mercury by FIMS	EG035W	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. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. 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)
Total Cyanide	EK026	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 FIA. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)
Total Cyanide By Discrete Analyser	EK026G	SOIL	APHA 21st ed., 4500-CN-C & N Total Cyanide is determined from aqueous solutions after distillation with sulphuric acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	SOIL	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	SOIL	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)
Semivolatile Organic Compounds	EP075	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 502)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	SOIL	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	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.
Total Cyanide	EK026-PR	SOIL	APHA 21st ed., 4500 CN- C&N. The sample is distilled with H2SO4 releasing all bound cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Digestion for Total Recoverable Metals in DI Water Leachate	EN25W	SOIL	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Deionised Water Leach	EN60-DIa	SOIL	AS4439.3 Preparation of Leachates
Deionised Water Leach - Zero Headspace Extraction	EN60Z-DIa	SOIL	AS4439.2 Preparation of Leachates
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)
Separatory Funnel Extraction of Liquids	ORG14	SOIL	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.
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.
Volatiles Water Preparation	ORG16-W	SOIL	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
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

- **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.

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
EK026: Total Cyanide						
Soil Glass Jar - Unpreserved BH410_2.0-2.2, BH410_7.0-7.2	24-MAY-2011	17-MAY-2011	**7**	----	----	----
Soil Glass Jar - Unpreserved BH410_17.0-17.5, BH410_23.0-23.2, QC639	24-MAY-2011	18-MAY-2011	**6**	----	----	----
Soil Glass Jar - Unpreserved BH410_26.0-26.2, BH410_32.0-32.2	24-MAY-2011	19-MAY-2011	**5**	----	----	----

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.**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1104095**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Site	: ----		
		No. of samples received	: 18
Quote number	: SY/418/10 V2	No. of samples analysed	: 18

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG094 : LCS recovery for some elements falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG094:Zn results for sample ES1104095-4 have been confirmed by reanalysis.**
- **EK025: Poor matrix spike recovery for sample ID MW210 on FCN due to sample matrrix. Confirmed by re-extraction and re-analysis.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.**
- **EP132: Insufficient sample has been provided for standard analysis. Where applicable LOR values have been adjusted accordingly.**
- **EP132: Particular samples (filter paper) required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Surrogates not determined due to sample matrix interferences.**
- **EP132: Positive results have been reported for Naphthalene in sample #18 Blank Filtrate due to carry over from other contaminated samples in this work order. Due to limited sample volume filtration and analysis could not be repeated.**
- **Samples 7 to 18 were produced in a filtering procedure requested by AECOM. Where requested a 500mL amber glass unpreserved bottle was filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter'. This filter paper was then analysed and is labeled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper. The second filter paper was then analysed and is labeled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample.**
  Before filtering any samples in each work order, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW210 FP1	MW210 FP2	MW62 FP1	MW62 FP2	MW68 FP1
				Client sampling date / time: 24-FEB-2011 10:45	24-FEB-2011 10:45	24-FEB-2011 12:45	24-FEB-2011 12:45	24-FEB-2011 14:10
				ES1104095-007	ES1104095-008	ES1104095-009	ES1104095-010	ES1104095-011
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	<10	<10	<10	<10
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthene	83-32-9	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthylene	208-96-8	10	µg/filter	<10	<10	<10	<10	<10
Anthracene	120-12-7	10	µg/filter	<10	<10	<10	<10	<10
Benz(a)anthracene	56-55-3	10	µg/filter	**10**	<10	<10	<10	<10
Benzo(a)pyrene	50-32-8	10	µg/filter	**10**	<10	<10	<10	<10
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<10	<10	<10	<10
Chrysene	218-01-9	10	µg/filter	<10	<10	<10	<10	<10
Coronene	191-07-1	10	µg/filter	<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	10	µg/filter	**20**	<10	<10	<10	<10
Fluorene	86-73-7	10	µg/filter	<10	<10	<10	<10	<10
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<10	<10	<10	<10
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	<100
Naphthalene	91-20-3	10	µg/filter	<10	<10	<10	<10	<10
Perylene	198-55-0	10	µg/filter	<10	<10	<10	<10	<10
Phenanthrene	85-01-8	10	µg/filter	<10	<10	<10	<10	<10
Pyrene	129-00-0	10	µg/filter	**20**	<10	<10	<10	<10
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW68 FP2	BLANK FP1	BLANK FP2	----	----
				Client sampling date / time: 24-FEB-2011 14:10	02-MAR-2011 10:45	02-MAR-2011 10:45	----	----
				ES1104095-012	ES1104095-016	ES1104095-017	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<10	----	----
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	<10	<10	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<10	----	----
Acenaphthene	83-32-9	10	µg/filter	<10	<10	<10	----	----
Acenaphthylene	208-96-8	10	µg/filter	<10	<10	<10	----	----
Anthracene	120-12-7	10	µg/filter	<10	<10	<10	----	----
Benz(a)anthracene	56-55-3	10	µg/filter	<10	<10	<10	----	----
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	<10	<10	----	----
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<10	<10	----	----
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<10	<10	----	----
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<10	<10	----	----
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<10	<10	----	----
Chrysene	218-01-9	10	µg/filter	<10	<10	<10	----	----
Coronene	191-07-1	10	µg/filter	<10	<10	<10	----	----
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<10	<10	----	----
Fluoranthene	206-44-0	10	µg/filter	<10	<10	<10	----	----
Fluorene	86-73-7	10	µg/filter	<10	<10	<10	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<10	<10	----	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	----	----
Naphthalene	91-20-3	10	µg/filter	<10	<10	<10	----	----
Perylene	198-55-0	10	µg/filter	<10	<10	<10	----	----
Phenanthrene	85-01-8	10	µg/filter	<10	<10	<10	----	----
Pyrene	129-00-0	10	µg/filter	<10	<10	<10	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW210	MW62	MW68	QC617	TRIP SPIKE
				Client sampling date / time: 24-FEB-2011 10:45	24-FEB-2011 12:45	24-FEB-2011 14:10	24-FEB-2011 15:00	23-FEB-2011 15:00
				ES1104095-001	ES1104095-002	ES1104095-003	ES1104095-004	ES1104095-005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	<10	<10	<10	----	----
Selenium	7782-49-2	2	µg/L	<2	<2	<2	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	**1.5**	**0.7**	<0.5	----	----
Barium	7440-39-3	1	µg/L	**75**	**433**	**107**	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Cadmium	7440-43-9	0.2	µg/L	**0.2**	<0.2	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Cobalt	7440-48-4	0.2	µg/L	**0.3**	**0.2**	<0.2	----	----
Copper	7440-50-8	1	µg/L	<1	<1	<1	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Manganese	7439-96-5	0.5	µg/L	**1810**	**72.5**	**175**	----	----
Nickel	7440-02-0	0.5	µg/L	**164**	**3.0**	**3.0**	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Vanadium	7440-62-2	0.5	µg/L	<0.5	**0.7**	<0.5	----	----
Zinc	7440-66-6	5	µg/L	**16**	<5	<5	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	----	----	----	<5	----
Antimony	7440-36-0	0.2	µg/L	----	----	----	<0.2	----
Selenium	7782-49-2	0.2	µg/L	----	----	----	<0.2	----
Arsenic	7440-38-2	0.2	µg/L	----	----	----	<0.2	----
Barium	7440-39-3	0.5	µg/L	----	----	----	<0.5	----
Beryllium	7440-41-7	0.1	µg/L	----	----	----	<0.1	----
Cadmium	7440-43-9	0.05	µg/L	----	----	----	<0.05	----
Chromium	7440-47-3	0.2	µg/L	----	----	----	<0.2	----
Cobalt	7440-48-4	0.1	µg/L	----	----	----	<0.1	----
Copper	7440-50-8	0.5	µg/L	----	----	----	<0.5	----
Lead	7439-92-1	0.1	µg/L	----	----	----	<0.1	----
Manganese	7439-96-5	0.5	µg/L	----	----	----	<0.5	----
Nickel	7440-02-0	0.5	µg/L	----	----	----	<0.5	----
Silver	7440-22-4	0.1	µg/L	----	----	----	<0.1	----
Vanadium	7440-62-2	0.2	µg/L	----	----	----	<0.2	----
Zinc	7440-66-6	1	µg/L	----	----	----	**3**	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW210	MW62	MW68	QC617	TRIP SPIKE
				Client sampling date / time: 24-FEB-2011 10:45	24-FEB-2011 12:45	24-FEB-2011 14:10	24-FEB-2011 15:00	23-FEB-2011 15:00
				ES1104095-001	ES1104095-002	ES1104095-003	ES1104095-004	ES1104095-005
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser - Continued								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L	**3.1**	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L	**2.6**	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L	**4.2**	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L	**1.1**	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	**0.9**	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	**80**	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	**730**	**390**	<100	----	----
C29 - C36 Fraction	----	50	µg/L	**70**	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	**880**	**390**	<50	----	----
EP080: BTEX								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW210	MW62	MW68	QC617	TRIP SPIKE
				Client sampling date / time: 24-FEB-2011 10:45	24-FEB-2011 12:45	24-FEB-2011 14:10	24-FEB-2011 15:00	23-FEB-2011 15:00
				ES1104095-001	ES1104095-002	ES1104095-003	ES1104095-004	ES1104095-005
EP080: BTEX - Continued								
Benzene	71-43-2	1	µg/L	**2**	<1	<1	<1	**18**
Toluene	108-88-3	2	µg/L	<5	<5	<5	<5	**18**
Ethylbenzene	100-41-4	2	µg/L	**3**	<2	<2	<2	**17**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	**17**
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	**17**
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**21.8**	**24.0**	**22.3**	**21.7**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**40.3**	**54.2**	**62.5**	**66.5**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**55.2**	**67.6**	**69.1**	**97.7**	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**43.1**	**59.1**	**69.3**	**69.8**	----
Anthracene-d10	1719-06-8	0.1	%	**55.5**	**72.3**	**78.8**	**81.7**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**68.0**	**75.3**	**68.9**	**97.5**	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**94.1**	**96.1**	**95.0**	**108**	**89.9**
Toluene-D8	2037-26-5	0.1	%	**105**	**108**	**108**	**119**	**102**
4-Bromofluorobenzene	460-00-4	0.1	%	**93.1**	**94.1**	**94.8**	**112**	**105**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: 23-FEB-2011 15:00 ES1104095-006	MW210 FILTRATE 24-FEB-2011 10:45 ES1104095-013	MW62 FILTRATE 24-FEB-2011 12:45 ES1104095-014	MW68 FILTRATE 24-FEB-2011 15:00 ES1104095-015	BLANK FILTRATE 02-MAR-2011 10:45 ES1104095-018
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	----	<0.10	<0.10	<0.10	<0.10
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	----	<0.10	<0.10	<0.10	<0.10
m-Cresol	108-39-4	0.1	µg/L	----	<0.2	**0.4**	**0.8**	<0.2
o-Cresol	95-48-7	0.1	µg/L	----	<0.2	**0.3**	**0.3**	<0.2
p-Cresol	106-44-5	0.1	µg/L	----	<0.2	<0.2	**0.3**	<0.2
2.4-Dichlorophenol	120-83-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
2.6-Dichlorophenol	87-65-0	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
2.4-Dimethylphenol	105-67-9	0.1	µg/L	----	<0.2	<0.2	**0.2**	<0.2
Hexachlorophene	70-30-4	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
2-Nitrophenol	88-75-5	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
4-Nitrophenol	100-02-7	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
Pentachlorophenol	87-86-5	0.05	µg/L	----	<0.10	<0.10	<0.10	<0.10
Phenol	108-95-2	0.1	µg/L	----	**0.4**	**0.3**	**0.9**	<0.2
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<0.2
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	----	<0.1	<0.1	**0.2**	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	----	**0.3**	<0.1	<0.1	<0.1
Anthracene	120-12-7	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: TRIP BLANK Client sampling date / time: 23-FEB-2011 15:00 ES1104095-006	Client sample ID: MW210 FILTRATE Client sampling date / time: 24-FEB-2011 10:45 ES1104095-013	Client sample ID: MW62 FILTRATE Client sampling date / time: 24-FEB-2011 12:45 ES1104095-014	Client sample ID: MW68 FILTRATE Client sampling date / time: 24-FEB-2011 15:00 ES1104095-015	Client sample ID: BLANK FILTRATE Client sampling date / time: 02-MAR-2011 10:45 ES1104095-018
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Coronene	191-07-1	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	----	**0.5**	**0.4**	**0.8**	**0.3**
Perylene	198-55-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L	----	<0.1	<0.1	**0.2**	<0.1
Pyrene	129-00-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**97.1**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**83.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**83.1**	----	----	----	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	----	**53.4**	**42.3**	**50.5**	**28.2**
Phenol-d6	13127-88-3	0.1	%	----	**34.0**	**28.4**	**32.9**	**16.6**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	**103**	**91.0**	**83.8**	**91.1**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**89.1**	**84.0**	**87.2**	**92.5**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	**98.3**	**91.3**	**89.7**	**105**
Anthracene-d10	1719-06-8	0.1	%	----	**86.2**	**82.9**	**86.6**	**93.5**
4-Terphenyl-d14	1718-51-0	0.1	%	----	**88.7**	**87.0**	**91.8**	**95.9**

Surrogate Control Limits

Sub-Matrix: **FILTER PAPER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

COC #1

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Gordon, NSW 2072
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	HOLD	Metals (M13) Ultra trace	Al, Sb, Se, Ag Ultra trace	TPH/BTEX	PAHs/Phenols	Free & WAD Cyanide	2x lab filtered Ultra Trace PAHs/Phenols	TPH(C_6-C_9) + BTEX	Other
1	MW210	24-2-11	10:45		X				X		2A, 2P, 2V		X	X	X	X	X	X		*Please Analyse Sediments on filter paper for each sample where possible for PAHs only
2	MW62	24-2-11	12:45		X				X		2A, 2P, 2V		X	X	X	X	X	X		
3	MW68	24-2-11	14:10		X				X		2A, 2P, 2V		X	X	X	X	X	X		
4	QC617	24-2-11	15:00		X				X		1A, 2P, 2V		X	X		X			X	
5	Trip Spike	23.2.11	–		X				X		2V								X	
6	Trip Blank	23.2.11	–		X				X		2V								X	

Environmental Division
Sydney
Work Order
ES1104095

Telephone : +61-2-8784 8555

* please hold Free & WAD cyanide bottle for QC617 until

Samples 1, 2 & 3 → UT PAH/phenols LOR will be raised as only received 50mL. This was ok with Gary Smith. 25/2/2011.

Sample 4 → 100mL amber received so PAH/phenols will be standard level. This was ok with Gary Smith. 25/2/2011. *Filtering procedure will not proceed on #4 as per Gary.

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: 2A = 2x ambers, 2P = plastics, 2V = 2x vials.

Lab Report No.

Esky ID

Relinquished by: Lauren Kontus Signed: 24-2-11

Recieved by: Signed: 24/2/11 1715

Printed copies of this document are uncontrolled

Page 1 of 1

Date: 26/08/2010

Relinquished by: Signed: Date:

Recieved by: Signed: Date:

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1104095**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 24-FEB-2011	Issue Date	: 03-MAR-2011 18:28
Client Requested Due Date	: 07-MAR-2011	Scheduled Reporting Date	: **07-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.4'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 18
Security Seal	: Intact.	No. of samples analysed	: 18

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **500mL amber bottles to be lab filtered twice before analysis. The first and second filter paper for each sample is to be analysed as seperate samples for Ultra Trace PAH.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EP132B Ultratrace PAH's
ES1104095-007	24-FEB-2011 10:45	MW210 FP1	✓
ES1104095-008	24-FEB-2011 10:45	MW210 FP2	✓
ES1104095-009	24-FEB-2011 12:45	MW62 FP1	✓
ES1104095-010	24-FEB-2011 12:45	MW62 FP2	✓
ES1104095-011	24-FEB-2011 14:10	MW68 FP1	✓
ES1104095-012	24-FEB-2011 14:10	MW68 FP2	✓
ES1104095-016	02-MAR-2011 10:45	BLANK FP1	✓
ES1104095-017	02-MAR-2011 10:45	BLANK FP2	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by ORC-ICPMS	WATER - EG094B-F Dissolved Metals in fresh water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-14A PAH/Phenols (SIM)	WATER - W-18 TPH(C6 - C9)/BTEX
ES1104095-001	24-FEB-2011 10:45	MW210	✓	✓	✓	✓	✓			
ES1104095-002	24-FEB-2011 12:45	MW62	✓	✓	✓	✓	✓			
ES1104095-003	24-FEB-2011 14:10	MW68	✓	✓	✓	✓	✓			
ES1104095-004	24-FEB-2011 15:00	QC617	✓	✓	✓				✓	✓
ES1104095-005	23-FEB-2011 15:00	TRIP SPIKE								✓
ES1104095-006	23-FEB-2011 15:00	TRIP BLANK								✓
ES1104095-013	24-FEB-2011 10:45	MW210 FILTRATE						✓		
ES1104095-014	24-FEB-2011 12:45	MW62 FILTRATE						✓		
ES1104095-015	24-FEB-2011 15:00	MW68 FILTRATE						✓		
ES1104095-018	02-MAR-2011 10:45	BLANK FILTRATE						✓		

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1104095-001	24-FEB-2011 10:45	MW210	✓
ES1104095-002	24-FEB-2011 12:45	MW62	✓
ES1104095-003	24-FEB-2011 14:10	MW68	✓

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1104095**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 18
Quote number	: SY/418/10 V2	No. of samples analysed	: 18

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035F: Dissolved Mercury by FIMS (QC Lot: 1691822)									
EB1103076-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1104095-003	MW68	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695997)									
ES1104095-001	MW210	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.5	1.3	13.1	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	1810	1860	2.8	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	164	170	3.4	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	75	75	0.0	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	<10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	16	18	7.8	No Limit
ES1104220-003	Anonymous	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	0.3	<0.1	110	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.5	0.5	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.1	1.1	0.0	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	18.0	18.2	1.2	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	55.7	58.0	4.0	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.0	1.1	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	48	47	3.1	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	10	10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	6	6	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998)									
ES1104095-001	MW210	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998) - continued									
ES1104220-003	Anonymous	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693910)									
EB1103512-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.3	0.3	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.5	0.4	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	4.1	4.1	0.0	0% - 20%
		EG094A-F: Barium	7440-39-3	0.5	µg/L	10.8	10.6	1.8	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	4.7	4.6	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	4.3	4.3	0.0	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	<1	<1	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	1000	945	5.8	0% - 20%
EB1103581-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.3	0.2	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	2.2	2.0	8.5	0% - 50%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	2.7	2.7	0.0	0% - 50%
		EG094A-F: Barium	7440-39-3	0.5	µg/L	27.8	27.4	1.3	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	1.7	1.8	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	0.7	0.7	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	<1	<1	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	33	32	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693911)									
EB1103512-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
EB1103581-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	4.2	4.1	0.0	0% - 20%
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1691656)									
ES1104095-001	MW210	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650)									

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 (%)
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650) - continued									
ES1104095-001	MW210	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1692312)									
ES1104095-001	MW210	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1104105-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1692312)									
ES1104095-001	MW210	EP080: Benzene	71-43-2	1	µg/L	2	2	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	3	3	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
ES1104105-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691178)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	102	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	76.5	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	45.5	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	77.9	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	94.7	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	74.8	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	77.2	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	81.9	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	82.4	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	109	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	80.0	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	111	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	85.7	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	52.8	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	72.4	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	76.6	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	78.8	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	70.4	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	1000 µg/kg	# 40.5	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	80.9	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	85.6	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	79.4	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	75.8	67.9	127

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
EG035F: Dissolved Mercury by FIMS (QCLot: 1691822)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	110	86	116
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)								
EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	50 µg/L	96.7	80	128
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	97.4	85	125
EG093A-F: Barium	7440-39-3	1	µg/L	<1	10 µg/L	87.7	81	129
EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	93.5	80	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997) - continued								
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	83.4	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	104	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	97.9	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	107	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	87.2	87	123
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	90	122
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	84	124
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	81.9	70	130
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	90.2	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	95.0	82	128
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695998)								
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	82.9	74	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693910)								
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	95.9	78	132
EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	101	86	124
EG094A-F: Barium	7440-39-3	0.5	µg/L	<0.5	10 µg/L	97.5	71	125
EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	102	73	127
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	86.8	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	94.7	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	98.8	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	99.0	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	# 79.6	82	120
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	101	82	126
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	100	86	122
EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	72.0	61	125
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	# 78.4	83	117
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	95.5	79	133
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693911)								
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	90.6	75	123
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	89.8	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	95.2	70	129
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	.5 µg/L	27.4	24.5	61.9
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	.5 µg/L	# 62.4	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	.5 µg/L	56.4	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	1 µg/L	53.6	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	.5 µg/L	87.2	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	.5 µg/L	99.6	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	.5 µg/L	95.8	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	.5 µg/L	68.2	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	.5 µg/L	63.8	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	.5 µg/L	65.8	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	.5 µg/L	63.5	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	1 µg/L	66.2	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	63.2	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	63.8	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	# 62.1	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	64.4	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	71.8	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	67.1	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	# 63.2	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	65.1	63.1	118
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163) - continued								
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	73.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	71.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	74.7	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	94.2	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	69.7	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	77.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	74.4	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	72.8	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1691162)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	62.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	77.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	73.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692312)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	107	75	127
EP080: BTEX (QCLot: 1692312)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	98.5	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.4	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	96.8	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.6	73	121
EP132A: Phenolic Compounds (QCLot: 1691161)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	101	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	105	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	66.0	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	71.4	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	60.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	107	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	108	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	103	40	128

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
EP132A: Phenolic Compounds (QCLot: 1691161) - continued								
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	# 116	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	104	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	59.6	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	# 96.8	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	37.2	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	99.6	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	102	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	108	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691161)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	113	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	85.8	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	51.4	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	93.3	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	97.8	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	97.5	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	97.7	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	103	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	92.4	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	# 121	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	99.2	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	104	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	101	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	76.1	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	102	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	99.4	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	99.7	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	101	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	107	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	79.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	85.7	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	97.5	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	98.9	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1691822)							
EB1103512-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	106	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)							
ES1104095-001	MW210	EG093A-F: Arsenic	7440-38-2	50 µg/L	88.4	70	130
		EG093A-F: Barium	7440-39-3	50 µg/L	110	70	130
		EG093A-F: Beryllium	7440-41-7	50 µg/L	74.2	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	86.7	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	92.7	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	97.3	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	97.3	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	97.2	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	71.5	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	118	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	87.8	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693910)							
EB1103512-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	111	70	130
		EG094A-F: Barium	7440-39-3	50 µg/L	109	70	130
		EG094A-F: Beryllium	7440-41-7	50 µg/L	108	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	87.9	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	104	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	112	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	110	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	92.4	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	106	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	111	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	106	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	115	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)							
ES1104095-001	MW210	EK025G: Free Cyanide	----	0.2 mg/L	# 47.3	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)							
ES1104095-001	MW210	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	70.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692312)							
ES1104095-001	MW210	EP080: C6 - C9 Fraction	----	325 µg/L	82.6	70	130
EP080: BTEX (QCLot: 1692312)							

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*
EP080: BTEX (QCLot: 1692312) - continued							
ES1104095-001	MW210	EP080: Benzene	71-43-2	25 µg/L	89.8	70	130
		EP080: Toluene	108-88-3	25 µg/L	86.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	79.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	84.2	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	78.9	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1104095**	Page	: 1 of 10
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 24-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 18
Quote number	: SY/418/10 V2	No. of samples analysed	: 18

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved BLANK FP1, BLANK FP2	**02-MAR-2011**	**02-MAR-2011**	16-MAR-2011	✓	**06-MAR-2011**	11-APR-2011	✓
Soil Glass Jar - Unpreserved MW210 FP1, MW210 FP2, MW62 FP1, MW62 FP2, MW68 FP1, MW68 FP2	**24-FEB-2011**	**02-MAR-2011**	10-MAR-2011	✓	**06-MAR-2011**	11-APR-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
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW210, MW62, MW68, QC617	**24-FEB-2011**	**---**	24-MAR-2011	----	**03-MAR-2011**	24-MAR-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW210, MW62, MW68	**24-FEB-2011**	**07-MAR-2011**	23-AUG-2011	✓	**07-MAR-2011**	23-AUG-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered QC617	**24-FEB-2011**	**04-MAR-2011**	23-AUG-2011	✓	**04-MAR-2011**	23-AUG-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW210, MW62, MW68	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-MAR-2011	✓
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW210, MW62, MW68	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-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
EP075(SIM)A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved								
MW210, MW68,	MW62, QC617	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
MW210, MW68,	MW62, QC617	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
MW210, MW68	MW62,	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber VOC Vial - HCl								
TRIP SPIKE,	TRIP BLANK	**23-FEB-2011**	**04-MAR-2011**	09-MAR-2011	✓	**04-MAR-2011**	09-MAR-2011	✓
Amber VOC Vial - HCl								
MW210, MW68,	MW62, QC617	**24-FEB-2011**	**04-MAR-2011**	10-MAR-2011	✓	**04-MAR-2011**	10-MAR-2011	✓
EP080: BTEX								
Amber VOC Vial - HCl								
TRIP SPIKE,	TRIP BLANK	**23-FEB-2011**	**04-MAR-2011**	09-MAR-2011	✓	**04-MAR-2011**	09-MAR-2011	✓
Amber VOC Vial - HCl								
MW210, MW68,	MW62, QC617	**24-FEB-2011**	**04-MAR-2011**	10-MAR-2011	✓	**04-MAR-2011**	10-MAR-2011	✓
EP132A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved								
BLANK FILTRATE		**02-MAR-2011**	**02-MAR-2011**	09-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved								
MW210 FILTRATE, MW68 FILTRATE	MW62 FILTRATE,	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
EP132B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
BLANK FILTRATE		**02-MAR-2011**	**02-MAR-2011**	09-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved								
MW210 FILTRATE, MW68 FILTRATE	MW62 FILTRATE,	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**03-MAR-2011**	11-APR-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 Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	16	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	16	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	15	13.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	18	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	16	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**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
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
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)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. 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)

Analytical Methods	Method	Matrix	Method Descriptions
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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							
EP132B: Polynuclear Aromatic Hydrocarbons	1987030-002	----	**N-2-Fluorenyl Acetamide**	53-96-3	40.5 %	50-138%	**Recovery less than lower control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	1990388-003	----	**Lead**	7439-92-1	79.6 %	82-120%	**Recovery less than lower control limit**
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	1990388-003	----	**Vanadium**	7440-62-2	78.4 %	83-117%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	1987002-007	----	**2-Chlorophenol**	95-57-8	62.4 %	63.8-110%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Acenaphthene**	83-32-9	62.1 %	62.2-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Fluoranthene**	206-44-0	63.2 %	63.6-118%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Hexachlorophene**	70-30-4	116 %	24.4-102%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Pentachlorophenol**	87-86-5	96.8 %	32.6-89.4%	**Recovery greater than upper control limit**
EP132B: Polynuclear Aromatic Hydrocarbons	1987000-002	----	**Benzo(e)pyrene**	192-97-2	121 %	75.3-118%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EG093F: Dissolved Metals in Saline Water by ORC-ICP	ES1104095-001	MW210	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK025G: Free cyanide by Discrete Analyser	ES1104095-001	MW210	**Free Cyanide**	----	47.3 %	70-130%	**Recovery less than lower data quality objective**

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

Regular Sample Surrogates

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES1104095-008	MW210 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-010	MW62 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-012	MW68 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-007	MW210 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104095-009	MW62 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-011	MW68 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-016	BLANK FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-017	BLANK FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-008	MW210 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-010	MW62 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-012	MW68 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-007	MW210 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-009	MW62 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-011	MW68 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-016	BLANK FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-017	BLANK FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-008	MW210 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-010	MW62 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-012	MW68 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-007	MW210 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-009	MW62 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-011	MW68 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-016	BLANK FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104095-017	BLANK FP2	**4-Terphenyl-d14**	1718-51-0	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.**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1104161**	Page	: 1 of 18
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 25-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Site	: ----		
		No. of samples received	: 35
Quote number	: SY/418/10 V2	No. of samples analysed	: 35

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG094 : LCS recovery for some elements falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EK025: FCN result has been adjusted to reflect thiocyanate interference on sample ID MW69**
- **EK025: Poor matrix spike recovery for sample ID MW210 on FCN due to sample matrrix. Confirmed by re-extraction and re-analysis.**
- **EP075(SIM): Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogate is not determined.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP080: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.**
- **EP132: Particular samples (filter paper) required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Poor surrogate reocvery due to sample matrix interferences.**
- **EP132: Positive results have been reported for Naphthalene in sample #35 Blank Filtrate due to carry over from other contaminated samples in this work order. Due to limited sample volume filtration and analysis could not be repeated.**
- **Samples 9 to 35 were produced in a filtering procedure requested by AECOM. Where requested a 500mL amber glass unpreserved bottle was filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter'. This filter paper was then analysed and is labeled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper. The second filter paper was then analysed and is labeled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample.**
  Before filtering any samples in each work order, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW69 FP1	MW69 FP2	MW401 FP1	MW401 FP2	IT3S FP1
				Client sampling date / time: 25-FEB-2011 12:10	25-FEB-2011 12:10	24-FEB-2011 16:30	24-FEB-2011 16:30	25-FEB-2011 11:05
				ES1104161-009	ES1104161-010	ES1104161-011	ES1104161-012	ES1104161-013
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	<20	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	**30**	<20	**160**	**40**	<20
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthene	83-32-9	10	µg/filter	**130**	<20	**50**	<20	<20
Acenaphthylene	208-96-8	10	µg/filter	**390**	<20	**40**	<20	<20
Anthracene	120-12-7	10	µg/filter	**180**	<20	**20**	<20	**40**
Benz(a)anthracene	56-55-3	10	µg/filter	**260**	<20	<20	<20	**270**
Benzo(a)pyrene	50-32-8	10	µg/filter	**220**	<20	<20	<20	**630**
Benzo(b)fluoranthene	205-99-2	10	µg/filter	**200**	<20	<20	<20	**590**
Benzo(e)pyrene	192-97-2	10	µg/filter	**100**	<20	<20	<20	**320**
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	**30**	<20	<20	<20	**230**
Benzo(k)fluoranthene	207-08-9	10	µg/filter	**60**	<20	<20	<20	**300**
Chrysene	218-01-9	10	µg/filter	**240**	<20	<20	<20	**230**
Coronene	191-07-1	10	µg/filter	<20	<20	<20	<20	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	<20	<20	<20	**20**
Fluoranthene	206-44-0	10	µg/filter	**330**	<20	<20	<20	**270**
Fluorene	86-73-7	10	µg/filter	**100**	<20	**60**	<20	<20
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	**20**	<20	<20	<20	**180**
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	<200
Naphthalene	91-20-3	10	µg/filter	**1850**	**120**	**620**	**270**	**40**
Perylene	198-55-0	10	µg/filter	**40**	<20	<20	<20	**140**
Phenanthrene	85-01-8	10	µg/filter	**800**	<20	**110**	<20	**120**
Pyrene	129-00-0	10	µg/filter	**480**	<20	<20	<20	**510**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT3S FP2	IT3M FP1	IT3M FP2	IT3D FP1	IT3D FP2
				Client sampling date / time: 25-FEB-2011 11:05	25-FEB-2011 09:50	25-FEB-2011 09:50	25-FEB-2011 10:45	25-FEB-2011 10:45
				ES1104161-014	ES1104161-015	ES1104161-016	ES1104161-017	ES1104161-018
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	**20**	<20	**30**	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	<20	<20	<20	**1870**	**120**
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthene	83-32-9	10	µg/filter	<20	**30**	<20	**280**	**20**
Acenaphthylene	208-96-8	10	µg/filter	<20	**70**	<20	**1090**	**100**
Anthracene	120-12-7	10	µg/filter	<20	**160**	<20	**720**	<20
Benz(a)anthracene	56-55-3	10	µg/filter	<20	**690**	<20	**690**	<20
Benzo(a)pyrene	50-32-8	10	µg/filter	<20	**1000**	<20	**700**	<20
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<20	**1040**	<20	**700**	<20
Benzo(e)pyrene	192-97-2	10	µg/filter	<20	**540**	<20	**350**	<20
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<20	**280**	<20	**180**	<20
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<20	**530**	<20	**360**	<20
Chrysene	218-01-9	10	µg/filter	<20	**660**	<20	**540**	<20
Coronene	191-07-1	10	µg/filter	<20	<20	<20	<20	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	**30**	<20	**30**	<20
Fluoranthene	206-44-0	10	µg/filter	<20	**890**	<20	**1090**	<20
Fluorene	86-73-7	10	µg/filter	<20	**60**	<20	**1080**	**20**
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<20	**210**	<20	**160**	<20
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	<200
Naphthalene	91-20-3	10	µg/filter	<20	**90**	<20	**15800**	**2140**
Perylene	198-55-0	10	µg/filter	<20	**250**	<20	**130**	<20
Phenanthrene	85-01-8	10	µg/filter	<20	**560**	<20	**2550**	**30**
Pyrene	129-00-0	10	µg/filter	<20	**1110**	<20	**960**	<20
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW198 FP1	MW198 FP2	QC618 FP1	QC618 FP2	QC615 FP1
				Client sampling date / time: 25-FEB-2011 14:00	25-FEB-2011 14:00	25-FEB-2011 15:00	25-FEB-2011 15:00	24-FEB-2011 15:00
				ES1104161-019	ES1104161-020	ES1104161-021	ES1104161-022	ES1104161-023
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	<20	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	<20	<20	<20	<20	**300**
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthene	83-32-9	10	µg/filter	<20	<20	<20	<20	**100**
Acenaphthylene	208-96-8	10	µg/filter	<20	<20	<20	<20	**90**
Anthracene	120-12-7	10	µg/filter	<20	<20	<20	<20	**40**
Benz(a)anthracene	56-55-3	10	µg/filter	<20	<20	<20	<20	<20
Benzo(a)pyrene	50-32-8	10	µg/filter	<20	<20	<20	<20	<20
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(e)pyrene	192-97-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<20	<20	<20	<20	<20
Chrysene	218-01-9	10	µg/filter	<20	<20	<20	<20	<20
Coronene	191-07-1	10	µg/filter	<20	<20	<20	<20	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	<20	<20	<20	<20
Fluoranthene	206-44-0	10	µg/filter	<20	<20	<20	<20	**40**
Fluorene	86-73-7	10	µg/filter	<20	<20	<20	<20	**110**
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<20	<20	<20	<20	<20
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	<200
Naphthalene	91-20-3	10	µg/filter	**20**	<20	<20	<20	**1160**
Perylene	198-55-0	10	µg/filter	<20	<20	<20	<20	<20
Phenanthrene	85-01-8	10	µg/filter	<20	<20	<20	<20	**190**
Pyrene	129-00-0	10	µg/filter	<20	<20	<20	<20	**30**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC615 FP2	BLANK FP1	BLANK FP2	----	----
				Client sampling date / time: 24-FEB-2011 15:00	24-FEB-2011 15:00	24-FEB-2011 15:00	----	----
				ES1104161-024	ES1104161-033	ES1104161-034	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	----	----
2-Methylnaphthalene	91-57-6	10	µg/filter	**50**	<20	<20	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	----	----
Acenaphthene	83-32-9	10	µg/filter	**20**	<20	<20	----	----
Acenaphthylene	208-96-8	10	µg/filter	**20**	<20	<20	----	----
Anthracene	120-12-7	10	µg/filter	<20	<20	<20	----	----
Benz(a)anthracene	56-55-3	10	µg/filter	<20	<20	<20	----	----
Benzo(a)pyrene	50-32-8	10	µg/filter	<20	<20	<20	----	----
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<20	<20	<20	----	----
Benzo(e)pyrene	192-97-2	10	µg/filter	<20	<20	<20	----	----
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<20	<20	<20	----	----
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<20	<20	<20	----	----
Chrysene	218-01-9	10	µg/filter	<20	<20	<20	----	----
Coronene	191-07-1	10	µg/filter	<20	<20	<20	----	----
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	<20	<20	----	----
Fluoranthene	206-44-0	10	µg/filter	<20	<20	<20	----	----
Fluorene	86-73-7	10	µg/filter	<20	<20	<20	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<20	<20	<20	----	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	----	----
Naphthalene	91-20-3	10	µg/filter	**380**	<20	<20	----	----
Perylene	198-55-0	10	µg/filter	<20	<20	<20	----	----
Phenanthrene	85-01-8	10	µg/filter	<20	<20	<20	----	----
Pyrene	129-00-0	10	µg/filter	<20	<20	<20	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW69	MW401	IT3S	IT3M	IT3D
				Client sampling date / time: 25-FEB-2011 12:10	24-FEB-2011 16:30	25-FEB-2011 11:05	25-FEB-2011 09:50	25-FEB-2011 10:45
				ES1104161-001	ES1104161-002	ES1104161-003	ES1104161-004	ES1104161-005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	**10**	<10	<10	**10**	<10
Selenium	7782-49-2	2	µg/L	<2	<2	<2	<2	<2
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	**1.7**	**2.1**	**0.5**
Arsenic	7440-38-2	0.5	µg/L	**0.6**	**2.8**	**1.7**	**0.8**	**0.7**
Barium	7440-39-3	1	µg/L	**123**	**5250**	**96**	**100**	**714**
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.2	µg/L	<0.2	**1.6**	**0.9**	**0.4**	<0.2
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L	**0.3**	**1.6**	**0.8**	**0.3**	**0.4**
Copper	7440-50-8	1	µg/L	<1	<1	<1	<1	<1
Lead	7439-92-1	0.2	µg/L	<0.2	**0.2**	**0.8**	**2.4**	**0.2**
Manganese	7439-96-5	0.5	µg/L	**168**	**406**	**72.0**	**33.6**	**294**
Nickel	7440-02-0	0.5	µg/L	<0.5	**66.4**	**5.4**	**1.2**	<0.5
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Vanadium	7440-62-2	0.5	µg/L	<0.5	**0.5**	**1.9**	**0.9**	**0.9**
Zinc	7440-66-6	5	µg/L	**12**	**16**	**17**	**46**	<5
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<5.0	**15.0**	<1.0	<1.0	<10.0
2-Chlorophenol	95-57-8	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
2-Methylphenol	95-48-7	1.0	µg/L	<5.0	**63.4**	<1.0	<1.0	**159**
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<10.0	**111**	<2.0	<2.0	**123**
2-Nitrophenol	88-75-5	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<5.0	**108**	<1.0	<1.0	**360**
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
Pentachlorophenol	87-86-5	2.0	µg/L	<10.0	<9.8	<2.0	<2.0	<20.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	**202**	**195**	<1.0	<1.0	**2560**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW69	MW401	IT3S	IT3M	IT3D
				Client sampling date / time: 25-FEB-2011 12:10	24-FEB-2011 16:30	25-FEB-2011 11:05	25-FEB-2011 09:50	25-FEB-2011 10:45
				ES1104161-001	ES1104161-002	ES1104161-003	ES1104161-004	ES1104161-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	1.0	µg/L	37.2	12.8	<1.0	<1.0	158
Acenaphthene	83-32-9	1.0	µg/L	11.7	10.5	<1.0	<1.0	25.0
Fluorene	86-73-7	1.0	µg/L	5.7	9.4	<1.0	<1.0	75.9
Phenanthrene	85-01-8	1.0	µg/L	32.0	16.3	<1.0	<1.0	77.7
Anthracene	120-12-7	1.0	µg/L	8.9	<4.9	<1.0	<1.0	25.7
Fluoranthene	206-44-0	1.0	µg/L	7.4	<4.9	1.9	<1.0	28.6
Pyrene	129-00-0	1.0	µg/L	15.1	5.2	4.5	1.0	41.8
Benz(a)anthracene	56-55-3	1.0	µg/L	<5.0	<4.9	2.2	<1.0	19.6
Chrysene	218-01-9	1.0	µg/L	<5.0	<4.9	1.4	<1.0	11.3
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<5.0	<4.9	4.8	<1.0	12.4
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<5.0	<4.9	2.5	<1.0	<10.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<5.0	<4.9	3.8	<0.5	12.8
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<5.0	<4.9	2.2	<1.0	<10.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<5.0	<4.9	<1.0	<1.0	<10.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<5.0	<4.9	3.0	<1.0	<10.0
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	210	350	<20	<20	2120
C10 - C14 Fraction	----	50	µg/L	530	790	<50	<50	5590
C15 - C28 Fraction	----	100	µg/L	330	1070	410	<100	2970
C29 - C36 Fraction	----	50	µg/L	<50	<50	240	<50	260
^ C10 - C36 Fraction (sum)	----	50	µg/L	860	1860	650	<50	8820
EP080: BTEX								
Benzene	71-43-2	1	µg/L	52	127	<1	<1	595
Toluene	108-88-3	2	µg/L	9	108	<5	<5	465
Ethylbenzene	100-41-4	2	µg/L	16	<5	<2	<2	51
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	13	27	<2	<2	325
ortho-Xylene	95-47-6	2	µg/L	13	15	<2	<2	136
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	Not Determined	Not Determined	16.0	23.3	Not Determined
2-Chlorophenol-D4	93951-73-6	0.1	%	Not Determined	Not Determined	44.8	65.6	Not Determined
2.4.6-Tribromophenol	118-79-6	0.1	%	110	109	47.3	94.5	Not Determined
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	Not Determined	Not Determined	40.0	62.1	Not Determined
Anthracene-d10	1719-06-8	0.1	%	Not Determined	112	60.2	76.0	Not Determined
4-Terphenyl-d14	1718-51-0	0.1	%	101	105	44.5	67.1	Not Determined
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	85.6	87.1	101	115	88.3

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW69	MW401	IT3S	IT3M	IT3D
				Client sampling date / time: 25-FEB-2011 12:10	24-FEB-2011 16:30	25-FEB-2011 11:05	25-FEB-2011 09:50	25-FEB-2011 10:45
				ES1104161-001	ES1104161-002	ES1104161-003	ES1104161-004	ES1104161-005
EP080S: TPH(V)/BTEX Surrogates - Continued								
Toluene-D8	2037-26-5	0.1	%	**111**	**96.3**	**98.4**	**113**	**96.3**
4-Bromofluorobenzene	460-00-4	0.1	%	**103**	**98.6**	**90.0**	**100**	**96.5**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW198 Client sampling date / time: 25-FEB-2011 14:00 ES1104161-006	Client sample ID: QC618 Client sampling date / time: 25-FEB-2011 15:00 ES1104161-007	Client sample ID: QC615 Client sampling date / time: 24-FEB-2011 15:00 ES1104161-008	Client sample ID: MW 69 FILTRATE Client sampling date / time: 25-FEB-2011 12:10 ES1104161-025	Client sample ID: MW401 FILTRATE Client sampling date / time: 24-FEB-2011 16:30 ES1104161-026
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	----	----	<10	----	----
Selenium	7782-49-2	2	µg/L	----	----	<2	----	----
Antimony	7440-36-0	0.5	µg/L	----	----	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	----	----	**3.1**	----	----
Barium	7440-39-3	1	µg/L	----	----	**5270**	----	----
Beryllium	7440-41-7	0.1	µg/L	----	----	<0.1	----	----
Cadmium	7440-43-9	0.2	µg/L	----	----	**0.5**	----	----
Chromium	7440-47-3	0.5	µg/L	----	----	<0.5	----	----
Cobalt	7440-48-4	0.2	µg/L	----	----	**1.4**	----	----
Copper	7440-50-8	1	µg/L	----	----	<1	----	----
Lead	7439-92-1	0.2	µg/L	----	----	<0.2	----	----
Manganese	7439-96-5	0.5	µg/L	----	----	**394**	----	----
Nickel	7440-02-0	0.5	µg/L	----	----	**64.2**	----	----
Silver	7440-22-4	0.1	µg/L	----	----	<0.1	----	----
Vanadium	7440-62-2	0.5	µg/L	----	----	**0.6**	----	----
Zinc	7440-66-6	5	µg/L	----	----	**11**	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**21**	**20**	----	----	----
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	----	----	----
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	----	----	----
Arsenic	7440-38-2	0.2	µg/L	**3.8**	**3.7**	----	----	----
Barium	7440-39-3	0.5	µg/L	**52.5**	**51.7**	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	----	----	----
Cadmium	7440-43-9	0.05	µg/L	**1.00**	**1.66**	----	----	----
Chromium	7440-47-3	0.2	µg/L	**1.1**	**1.1**	----	----	----
Cobalt	7440-48-4	0.1	µg/L	**0.6**	**0.6**	----	----	----
Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	----	----	----
Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	----	----	----
Manganese	7439-96-5	0.5	µg/L	**103**	**102**	----	----	----
Nickel	7440-02-0	0.5	µg/L	**69.1**	**64.6**	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	----	----	----
Vanadium	7440-62-2	0.2	µg/L	**0.7**	**0.7**	----	----	----
Zinc	7440-66-6	1	µg/L	**8**	**8**	----	----	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW198 Client sampling date / time: 25-FEB-2011 14:00 ES1104161-006	QC618 25-FEB-2011 15:00 ES1104161-007	QC615 24-FEB-2011 15:00 ES1104161-008	MW 69 FILTRATE 25-FEB-2011 12:10 ES1104161-025	MW401 FILTRATE 24-FEB-2011 16:30 ES1104161-026
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser - Continued								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	**15.4**	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<10.0	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	**58.2**	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	**111**	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<10.0	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	**95.3**	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<10.0	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<10.0	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<10.0	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<10.0	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<20.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	**184**	----	----
Acenaphthylene	208-96-8	1.0	µg/L	**1.4**	**2.4**	**12.1**	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	**10.5**	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	**11.4**	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	**15.0**	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<10.0	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<10.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<10.0	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	**400**	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	**800**	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	**1050**	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	**1850**	----	----
EP080: BTEX								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW198	QC618	QC615	MW 69 FILTRATE	MW401 FILTRATE
				Client sampling date / time: 25-FEB-2011 14:00	25-FEB-2011 15:00	24-FEB-2011 15:00	25-FEB-2011 12:10	24-FEB-2011 16:30
				ES1104161-006	ES1104161-007	ES1104161-008	ES1104161-025	ES1104161-026
EP080: BTEX - Continued								
Benzene	71-43-2	1	µg/L	<1	<1	**138**	----	----
Toluene	108-88-3	2	µg/L	<5	<5	**112**	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<5	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	**30**	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	**14**	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	----	----	----	<0.10	<0.10
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	----	----	----	<0.10	<0.10
m-Cresol	108-39-4	0.1	µg/L	----	----	----	**0.5**	**31.1**
o-Cresol	95-48-7	0.1	µg/L	----	----	----	**0.3**	**27.8**
p-Cresol	106-44-5	0.1	µg/L	----	----	----	<0.2	**18.7**
2.4-Dichlorophenol	120-83-2	0.1	µg/L	----	----	----	<0.2	<0.2
2.6-Dichlorophenol	87-65-0	0.1	µg/L	----	----	----	<0.2	<0.2
2.4-Dimethylphenol	105-67-9	0.1	µg/L	----	----	----	**0.3**	**50.0**
Hexachlorophene	70-30-4	0.1	µg/L	----	----	----	<0.2	<0.2
2-Nitrophenol	88-75-5	0.1	µg/L	----	----	----	<0.2	<0.2
4-Nitrophenol	100-02-7	0.1	µg/L	----	----	----	<0.2	<0.2
Pentachlorophenol	87-86-5	0.05	µg/L	----	----	----	<0.10	<0.10
Phenol	108-95-2	0.1	µg/L	----	----	----	**0.5**	**6.6**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	----	----	----	<0.2	<0.2
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	----	----	----	<0.2	<0.2
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	----	----	----	<0.2	<0.2
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	----	----	----	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	----	----	----	<0.1	**2.1**
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	----	----	----	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	----	----	----	<0.1	**1.2**
Acenaphthylene	208-96-8	0.1	µg/L	----	----	----	<0.1	**1.0**
Anthracene	120-12-7	0.1	µg/L	----	----	----	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	----	----	----	<0.1	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	----	----	----	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	----	----	----	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	----	----	----	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	----	----	----	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	----	----	----	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	----	----	----	<0.1	<0.1
Coronene	191-07-1	0.1	µg/L	----	----	----	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	----	----	----	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW198	QC618	QC615	MW 69 FILTRATE	MW401 FILTRATE
				Client sampling date / time: 25-FEB-2011 14:00	25-FEB-2011 15:00	24-FEB-2011 15:00	25-FEB-2011 12:10	24-FEB-2011 16:30
				ES1104161-006	ES1104161-007	ES1104161-008	ES1104161-025	ES1104161-026
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	0.1	µg/L	----	----	----	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L	----	----	----	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	----	----	----	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	----	----	----	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	----	----	----	**5.0**	**47.7**
Perylene	198-55-0	0.1	µg/L	----	----	----	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L	----	----	----	<0.1	<0.1
Pyrene	129-00-0	0.1	µg/L	----	----	----	<0.1	<0.1
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**14.0**	**19.3**	**Not Determined**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**31.2**	**52.2**	**Not Determined**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**46.5**	**70.2**	**Not Determined**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**32.0**	**54.2**	**Not Determined**	----	----
Anthracene-d10	1719-06-8	0.1	%	**35.7**	**56.6**	**Not Determined**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**44.2**	**76.0**	**Not Determined**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**92.5**	**120**	**88.1**	----	----
Toluene-D8	2037-26-5	0.1	%	**99.5**	**108**	**96.4**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**100**	**109**	**89.3**	----	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	----	----	----	**29.4**	**28.4**
Phenol-d6	13127-88-3	0.1	%	----	----	----	**20.4**	**19.6**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	----	**90.5**	**57.4**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	----	**82.3**	**63.2**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	----	**97.6**	**59.5**
Anthracene-d10	1719-06-8	0.1	%	----	----	----	**89.6**	**65.9**
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	----	**89.9**	**64.6**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT3S FILTRATE Client sampling date / time: 25-FEB-2011 11:05 ES1104161-027	IT3M FILTRATE 25-FEB-2011 09:50 ES1104161-028	IT3D FILTRATE 25-FEB-2011 10:45 ES1104161-029	MW198 FILTRATE 25-FEB-2011 14:00 ES1104161-030	QC618 FILTRATE 25-FEB-2011 15:00 ES1104161-031
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
m-Cresol	108-39-4	0.1	µg/L	**0.5**	<0.2	**43.0**	<0.2	**0.2**
o-Cresol	95-48-7	0.1	µg/L	**0.3**	<0.2	**94.2**	<0.2	<0.2
p-Cresol	106-44-5	0.1	µg/L	<0.2	<0.2	**21.8**	<0.2	<0.2
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.2	<0.2	**280**	<0.2	<0.2
Hexachlorophene	70-30-4	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
2-Nitrophenol	88-75-5	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
4-Nitrophenol	100-02-7	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Pentachlorophenol	87-86-5	0.05	µg/L	<0.10	<0.10	<0.10	<0.10	<0.10
Phenol	108-95-2	0.1	µg/L	**1.0**	**0.2**	**6.9**	**0.3**	**0.5**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	**8.2**	<0.1	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	**2.1**	<0.1	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	**10.2**	**0.4**	**0.4**
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	**0.4**	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	**0.5**	**0.2**	**549**	**0.7**	**0.6**
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT3S FILTRATE	IT3M FILTRATE	IT3D FILTRATE	MW198 FILTRATE	QC618 FILTRATE
				Client sampling date / time: 25-FEB-2011 11:05	25-FEB-2011 09:50	25-FEB-2011 10:45	25-FEB-2011 14:00	25-FEB-2011 15:00
				ES1104161-027	ES1104161-028	ES1104161-029	ES1104161-030	ES1104161-031
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**68.8**	**24.8**	**54.4**	**36.7**	**57.8**
Phenol-d6	13127-88-3	0.1	%	**45.6**	**17.1**	**40.7**	**23.7**	**34.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**96.5**	**78.7**	**69.4**	**93.2**	**112**
2.4.6-Tribromophenol	118-79-6	0.1	%	**103**	**54.1**	**102**	**93.7**	**89.6**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**88.2**	**84.4**	**77.2**	**97.0**	**108**
Anthracene-d10	1719-06-8	0.1	%	**104**	**72.2**	**98.9**	**86.8**	**83.7**
4-Terphenyl-d14	1718-51-0	0.1	%	**104**	**71.3**	**89.9**	**84.8**	**83.7**

Analytical Results

Sub-Matrix: WATER				Client sample ID	QC615 FILTRATE	BLANK FILTRATE	----	----	----
				Client sampling date / time	24-FEB-2011 15:00	25-FEB-2011 12:10	----	----	----
Compound	CAS Number	LOR	Unit		ES1104161-032	ES1104161-035	----	----	----
EP132A: Phenolic Compounds									
2-Chlorophenol	95-57-8	0.05	µg/L		<0.10	<0.10	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L		<0.10	<0.10	----	----	----
m-Cresol	108-39-4	0.1	µg/L		**29.3**	<0.2	----	----	----
o-Cresol	95-48-7	0.1	µg/L		**26.7**	<0.2	----	----	----
p-Cresol	106-44-5	0.1	µg/L		**17.9**	<0.2	----	----	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L		<0.2	<0.2	----	----	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L		<0.2	<0.2	----	----	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L		**48.4**	<0.2	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L		<0.2	<0.2	----	----	----
2-Nitrophenol	88-75-5	0.1	µg/L		<0.2	<0.2	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L		<0.2	<0.2	----	----	----
Pentachlorophenol	87-86-5	0.05	µg/L		<0.10	<0.10	----	----	----
Phenol	108-95-2	0.1	µg/L		**9.4**	<0.2	----	----	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L		<0.2	<0.2	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L		<0.2	<0.2	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L		<0.2	<0.2	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		<0.1	<0.1	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L		**2.3**	<0.1	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		<0.1	<0.1	----	----	----
Acenaphthene	83-32-9	0.1	µg/L		**1.4**	<0.1	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L		**1.2**	<0.1	----	----	----
Anthracene	120-12-7	0.1	µg/L		**0.1**	<0.1	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L		<0.1	<0.1	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L		<0.1	<0.1	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L		<0.1	<0.1	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L		<0.1	<0.1	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		<0.1	<0.1	----	----	----
Chrysene	218-01-9	0.1	µg/L		<0.1	<0.1	----	----	----
Coronene	191-07-1	0.1	µg/L		<0.1	<0.1	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L		<0.1	<0.1	----	----	----
Fluoranthene	206-44-0	0.1	µg/L		<0.1	<0.1	----	----	----
Fluorene	86-73-7	0.1	µg/L		<0.1	<0.1	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		<0.1	<0.1	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L		<0.1	<0.1	----	----	----
Naphthalene	91-20-3	0.1	µg/L		**39.6**	**0.6**	----	----	----
Perylene	198-55-0	0.1	µg/L		<0.1	<0.1	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	QC615 FILTRATE	BLANK FILTRATE	----	----	----
				Client sampling date / time	24-FEB-2011 15:00	25-FEB-2011 12:10	----	----	----
Compound	CAS Number	LOR	Unit		ES1104161-032	ES1104161-035	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.1	µg/L		<0.1	<0.1	----	----	----
Pyrene	129-00-0	0.1	µg/L		<0.1	<0.1	----	----	----
EP132S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**53.2**	**27.4**	----	----	----
Phenol-d6	13127-88-3	0.1	%		**35.8**	**17.4**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**93.8**	**88.2**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**77.9**	**58.6**	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**86.2**	**107**	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**94.9**	**84.8**	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**92.0**	**82.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: **FILTER PAPER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Chain of Custody

Subcon / ~~Forward Lab~~ / Split WO
Lab / Analysis: Labmark
Organised By / Date:
~~Relinquished By / Date:~~
~~Connote / Courier:~~
WO No:
~~Attach By PO / Internal Sheet:~~

COC #2.

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1

Environmental Division Sydney
Work Order
ES1104161
Telephone : +61-2-8784 8555

Laboratory Details
Lab. Name: ALS
Lab. Address:277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☑ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	soil	water	other	filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: METALS (M13) (ultratrace)	Al, Sb, Se, Ag (ultratrace)	TPH / BTEX	PAHs / Phenols	Free & WAD Cyanide	2x Lab Filtered ultratrace PAHs / phenols	Other
1	MW69	25-2-11	12:10		X				X		2A, 2P, 3V	X	X	X	X	X	X	* Please
2 (410)	MW401	25-2-11	16:30		X				X			X	X	X	X	X	X	analyse
3	IT3S	25-2-11	11:05		X				X			X	X	X	X	X	X	sediments on
4	IT3M	25-2-11	9:50		X				X			X	X	X	X	X	X	filter paper
5	IT3D	25-2-11	10:45		X				X			X	X	X	X	X	X	for each
6	MW198	25-2-11	14:00		X				X			X	X	X	X	X	X	sample
7	QC618	25-2-11	—		X				X		↓	✓	X	X	X	X	X	where
																		possible
Extra - 8	QC-615	24/2/11										X	X	X	X	X	As per Kate Orton 28/2/2011.	for PAHs
Labmark. **	QC-616.			Forward to Labmark								X	X	X	X	X	As per Kate Orton 28/2/2011.	only
																		As per Kate Orton & Craig Smith 28/2/11.

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: A = amber, V = vial, P = plastic

Relinquished by: Lauren Kontus Signed: 25/2/11
Recieved by: Taylor McKellar Signed: 25/2/11 1700

Printed copies of this document are uncontrolled. Page 1 of 1
Date: 26/03/2010

Relinquished by: Signed: Date:
Recieved by: Signed: Date:

Lab Report No.
Esky ID

BMS-PM-DV-F046 Revision: Jun 08

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1104161**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 25-FEB-2011	Issue Date	: 03-MAR-2011 16:00
Client Requested Due Date	: 07-MAR-2011	Scheduled Reporting Date	: **07-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 8.2'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 35
Security Seal	: Intact.	No. of samples analysed	: 35

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **500mL amber bottles to be lab filtered twice before analysis. The first and second filter paper for each sample is to be analysed as seperate samples for Ultra Trace PAH.**
- **Extra sample received labelled QC-615 24/2/11. To be analysed as per Kate O'Brien and Gary Smith 28/2/11.**
- **Sample ID on COC is MW401 but received as MW410 on bottle, lab will follow the bottle ID.**
- **Sample QC616 forwarded to Labmark as per COC.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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 - EP132B Ultratrace PAH's
ES1104161-009	25-FEB-2011 12:10	MW69 FP1	✓
ES1104161-010	25-FEB-2011 12:10	MW69 FP2	✓
ES1104161-011	24-FEB-2011 16:30	MW401 FP1	✓
ES1104161-012	24-FEB-2011 16:30	MW401 FP2	✓
ES1104161-013	25-FEB-2011 11:05	IT3S FP1	✓
ES1104161-014	25-FEB-2011 11:05	IT3S FP2	✓
ES1104161-015	25-FEB-2011 09:50	IT3M FP1	✓
ES1104161-016	25-FEB-2011 09:50	IT3M FP2	✓
ES1104161-017	25-FEB-2011 10:45	IT3D FP1	✓
ES1104161-018	25-FEB-2011 10:45	IT3D FP2	✓
ES1104161-019	25-FEB-2011 14:00	MW198 FP1	✓
ES1104161-020	25-FEB-2011 14:00	MW198 FP2	✓
ES1104161-021	25-FEB-2011 15:00	QC618 FP1	✓
ES1104161-022	25-FEB-2011 15:00	QC618 FP2	✓
ES1104161-023	24-FEB-2011 15:00	QC615 FP1	✓
ES1104161-024	24-FEB-2011 15:00	QC615 FP2	✓
ES1104161-033	24-FEB-2011 15:00	BLANK FP1	✓
ES1104161-034	24-FEB-2011 15:00	BLANK FP2	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by ORC-ICPMS	WATER - EG094B-F Dissolved Metals in fresh water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1104161-001	25-FEB-2011 12:10	MW69	✓	✓	✓	✓	✓		✓
ES1104161-002	24-FEB-2011 16:30	MW401	✓	✓	✓	✓	✓		✓
ES1104161-003	25-FEB-2011 11:05	IT3S	✓	✓	✓	✓	✓		✓
ES1104161-004	25-FEB-2011 09:50	IT3M	✓	✓	✓	✓	✓		✓
ES1104161-005	25-FEB-2011 10:45	IT3D	✓	✓	✓	✓	✓		✓
ES1104161-006	25-FEB-2011 14:00	MW198	✓	✓	✓	✓	✓		✓

			WATER - EG035F Dissolved Mercury by FIMS	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by ORC-ICPMS	WATER - EG094B-F Dissolved Metals in fresh water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1104161-007	25-FEB-2011 15:00	QC618	✓	✓	✓	✓	✓		✓
ES1104161-008	24-FEB-2011 15:00	QC615	✓	✓	✓	✓	✓		✓
ES1104161-025	25-FEB-2011 12:10	MW 69 FILTRATE						✓	
ES1104161-026	24-FEB-2011 16:30	MW401 FILTRATE						✓	
ES1104161-027	25-FEB-2011 11:05	IT3S FILTRATE						✓	
ES1104161-028	25-FEB-2011 09:50	IT3M FILTRATE						✓	
ES1104161-029	25-FEB-2011 10:45	IT3D FILTRATE						✓	
ES1104161-030	25-FEB-2011 14:00	MW198 FILTRATE						✓	
ES1104161-031	25-FEB-2011 15:00	QC618 FILTRATE						✓	
ES1104161-032	24-FEB-2011 15:00	QC615 FILTRATE						✓	
ES1104161-035	25-FEB-2011 12:10	BLANK FILTRATE						✓	

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
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- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1104161**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 35
Quote number	: SY/418/10 V2	No. of samples analysed	: 35

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035F: Dissolved Mercury by FIMS (QC Lot: 1691822)									
EB1103076-002	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1104095-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695997)									
ES1104095-001	Anonymous	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.5	1.3	13.1	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	1810	1860	2.8	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	164	170	3.4	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	75	75	0.0	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	<10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	16	18	7.8	No Limit
ES1104220-003	Anonymous	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	0.3	<0.1	110	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.5	0.5	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.1	1.1	0.0	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	18.0	18.2	1.2	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	55.7	58.0	4.0	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.0	1.1	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	48	47	3.1	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	10	10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	6	6	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998)									
ES1104095-001	Anonymous	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998) - continued									
ES1104220-003	Anonymous	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693912)									
EB1103525-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.2	0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.8	0.8	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	59.7	57.7	3.5	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	0.9	1.0	15.2	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	2.0	2.1	6.7	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	<1	<1	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	59	52	12.5	0% - 50%
ES1104161-006	MW198	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	1.00	1.03	3.2	0% - 20%
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	3.8	4.0	2.9	0% - 20%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	1.1	1.0	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.7	0.7	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	52.5	52.2	0.5	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	103	105	1.8	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	69.1	67.9	1.8	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	8	8	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	21	22	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693913)									
EB1103525-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.4	0.3	0.0	No Limit
ES1104161-006	MW198	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1691656)									
ES1104095-001	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	QC618	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650)									

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 (%)
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650) - continued									
ES1104095-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	QC618	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1692311)									
ES1104137-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1104161-001	MW69	EP080: C6 - C9 Fraction	----	20	µg/L	210	200	0.0	0% - 50%
EP080: BTEX (QC Lot: 1692311)									
ES1104137-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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
ES1104161-001	MW69	EP080: Benzene	71-43-2	1	µg/L	52	52	0.0	0% - 20%
		EP080: Toluene	108-88-3	2	µg/L	9	9	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	16	16	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	13	13	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	13	13	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691172)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	95.6	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	67.8	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	39.9	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	82.0	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	70.3	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	73.5	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	79.7	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	83.9	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	99.2	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	113	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	73.1	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	96.1	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	85.4	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	38.2	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	75.5	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	82.2	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	79.6	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	75.9	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	1000 µg/kg	55.8	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	74.8	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	70.4	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	84.3	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	81.8	67.9	127

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
EG035F: Dissolved Mercury by FIMS (QCLot: 1691822)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	110	86	116
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)								
EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	50 µg/L	96.7	80	128
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	97.4	85	125
EG093A-F: Barium	7440-39-3	1	µg/L	<1	10 µg/L	87.7	81	129
EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	93.5	80	122

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
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997) - continued								
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	83.4	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	104	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	97.9	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	107	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	87.2	87	123
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	90	122
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	84	124
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	81.9	70	130
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	90.2	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	95.0	82	128
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695998)								
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	82.9	74	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693912)								
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	102	78	132
EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	99.4	86	124
EG094A-F: Barium	7440-39-3	0.5	µg/L	<0.5	10 µg/L	101	71	125
EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	101	73	127
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	86.2	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.8	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	102	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	102	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	89.2	82	120
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	101	82	126
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	102	86	122
EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	72.0	61	125
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	# 80.2	83	117
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	103	79	133
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693913)								
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	96.1	75	123
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	89.8	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	95.2	70	129
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	.5 µg/L	27.4	24.5	61.9
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	.5 µg/L	# 62.4	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	.5 µg/L	56.4	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	1 µg/L	53.6	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	.5 µg/L	87.2	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	.5 µg/L	99.6	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	.5 µg/L	95.8	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	.5 µg/L	68.2	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	.5 µg/L	63.8	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	.5 µg/L	65.8	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	.5 µg/L	63.5	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	1 µg/L	66.2	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	63.2	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	63.8	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	# 62.1	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	64.4	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	71.8	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	67.1	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	# 63.2	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	65.1	63.1	118
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163) - continued								
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	73.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	71.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	74.7	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	94.2	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	69.7	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	77.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	74.4	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	72.8	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1691162)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	62.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	77.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	73.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692311)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	91.0	75	127
EP080: BTEX (QCLot: 1692311)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	102	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	108	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	101	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	96.7	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	101	73	121
EP132A: Phenolic Compounds (QCLot: 1691161)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	101	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	105	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	66.0	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	71.4	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	60.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	107	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	108	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	103	40	128

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
EP132A: Phenolic Compounds (QCLot: 1691161) - continued								
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	# 116	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	104	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	59.6	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	# 96.8	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	37.2	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	99.6	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	102	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	108	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691161)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	113	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	85.8	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	51.4	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	93.3	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	97.8	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	97.5	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	97.7	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	103	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	92.4	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	# 121	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	99.2	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	104	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	101	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	76.1	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	102	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	99.4	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	99.7	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	101	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	107	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	79.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	85.7	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	97.5	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	98.9	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1691822)							
EB1103512-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	106	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)							
ES1104095-001	Anonymous	EG093A-F: Arsenic	7440-38-2	50 µg/L	88.4	70	130
		EG093A-F: Barium	7440-39-3	50 µg/L	110	70	130
		EG093A-F: Beryllium	7440-41-7	50 µg/L	74.2	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	86.7	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	92.7	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	97.3	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	97.3	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	97.2	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	71.5	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	118	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	87.8	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693912)							
EB1103525-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	108	70	130
		EG094A-F: Barium	7440-39-3	50 µg/L	99.3	70	130
		EG094A-F: Beryllium	7440-41-7	50 µg/L	98.6	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	75.7	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	87.5	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	98.2	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	96.2	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	72.2	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	92.6	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	95.2	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	92.2	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	102	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)							
ES1104095-001	Anonymous	EK025G: Free Cyanide	----	0.2 mg/L	# 47.3	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)							
ES1104095-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	70.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692311)							
ES1104137-003	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	76.8	70	130
EP080: BTEX (QCLot: 1692311)							

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*
EP080: BTEX (QCLot: 1692311) - continued							
ES1104137-003	Anonymous	EP080: Benzene	71-43-2	25 µg/L	85.8	70	130
		EP080: Toluene	108-88-3	25 µg/L	100	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.7	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	87.4	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	93.1	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1104161**	Page	: 1 of 14
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 25-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 35
Quote number	: SY/418/10 V2	No. of samples analysed	: 35

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved MW401 FP1, MW401 FP2, QC615 FP1, QC615 FP2, BLANK FP1, BLANK FP2	**24-FEB-2011**	**02-MAR-2011**	10-MAR-2011	✓	**06-MAR-2011**	11-APR-2011	✓
Soil Glass Jar - Unpreserved MW69 FP1, MW69 FP2, IT3S FP1, IT3S FP2, IT3M FP1, IT3M FP2, IT3D FP1, IT3D FP2, MW198 FP1, MW198 FP2, QC618 FP1, QC618 FP2	**25-FEB-2011**	**02-MAR-2011**	11-MAR-2011	✓	**06-MAR-2011**	11-APR-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
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW401, QC615	**24-FEB-2011**	---	24-MAR-2011	----	**03-MAR-2011**	24-MAR-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW69, IT3S, IT3M, IT3D, MW198, QC618	**25-FEB-2011**	---	25-MAR-2011	----	**03-MAR-2011**	25-MAR-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW401, QC615	**24-FEB-2011**	**07-MAR-2011**	23-AUG-2011	✓	**07-MAR-2011**	23-AUG-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW69, IT3S, IT3M, IT3D	**25-FEB-2011**	**07-MAR-2011**	24-AUG-2011	✓	**07-MAR-2011**	24-AUG-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW198, QC618	**25-FEB-2011**	**04-MAR-2011**	24-AUG-2011	✓	**04-MAR-2011**	24-AUG-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
EK025G: Free cyanide by Discrete Analyser								
White Plastic Bottle-NaOH (Cd Nitrate Optional)								
MW401,	QC615	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-MAR-2011	✓
White Plastic Bottle-NaOH (Cd Nitrate Optional)								
MW69,	IT3S,	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
White Plastic Bottle-NaOH (Cd Nitrate Optional)								
MW401,	QC615	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-MAR-2011	✓
White Plastic Bottle-NaOH (Cd Nitrate Optional)								
MW69,	IT3S,	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							
EP075(SIM)A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved								
MW401,	QC615	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved								
MW69,	IT3S,	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
MW401,	QC615	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved								
MW69,	IT3S,	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved								
MW401,	QC615	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved								
MW69,	IT3S,	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							
Amber VOC Vial - HCl								
MW401,	QC615	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-MAR-2011	✓
Amber VOC Vial - HCl								
MW69,	IT3S,	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
IT3M,	IT3D,							
MW198,	QC618							

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: BTEX							
Amber VOC Vial - HCl MW401, QC615	**24-FEB-2011**	**03-MAR-2011**	10-MAR-2011	✓	**03-MAR-2011**	10-MAR-2011	✓
Amber VOC Vial - HCl MW69, IT3S, IT3M, IT3D, MW198, QC618	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved MW401 FILTRATE, QC615 FILTRATE	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW 69 FILTRATE, IT3S FILTRATE, IT3M FILTRATE, IT3D FILTRATE, MW198 FILTRATE, QC618 FILTRATE, BLANK FILTRATE	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved MW401 FILTRATE, QC615 FILTRATE	**24-FEB-2011**	**02-MAR-2011**	03-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW 69 FILTRATE, IT3S FILTRATE, IT3M FILTRATE, IT3D FILTRATE, MW198 FILTRATE, QC618 FILTRATE, BLANK FILTRATE	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**03-MAR-2011**	11-APR-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 Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	10	20.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	10	20.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	15	13.3	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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	18	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**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
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
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)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. 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)

Analytical Methods	Method	Matrix	Method Descriptions
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	1990389-003	----	**Vanadium**	7440-62-2	80.2 %	83-117%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	1987002-007	----	**2-Chlorophenol**	95-57-8	62.4 %	63.8-110%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Acenaphthene**	83-32-9	62.1 %	62.2-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Fluoranthene**	206-44-0	63.2 %	63.6-118%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Hexachlorophene**	70-30-4	116 %	24.4-102%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Pentachlorophenol**	87-86-5	96.8 %	32.6-89.4%	**Recovery greater than upper control limit**
EP132B: Polynuclear Aromatic Hydrocarbons	1987000-002	----	**Benzo(e)pyrene**	192-97-2	121 %	75.3-118%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EG093F: Dissolved Metals in Saline Water by ORC-ICP	ES1104095-001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK025G: Free cyanide by Discrete Analyser	ES1104095-001	Anonymous	**Free Cyanide**	----	47.3 %	70-130%	**Recovery less than lower data quality objective**

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

Regular Sample Surrogates

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES1104161-033	BLANK FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-034	BLANK FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-010	MW69 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-012	MW401 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-014	IT3S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-016	IT3M FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-018	IT3D FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104161-020	MW198 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-022	QC618 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-009	MW69 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-011	MW401 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-013	IT3S FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-015	IT3M FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-017	IT3D FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-019	MW198 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-021	QC618 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-024	QC615 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-023	QC615 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-033	BLANK FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-034	BLANK FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-010	MW69 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-012	MW401 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-014	IT3S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-016	IT3M FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-018	IT3D FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-020	MW198 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-022	QC618 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-009	MW69 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-011	MW401 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104161-013	IT3S FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-015	IT3M FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-017	IT3D FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-019	MW198 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-021	QC618 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-024	QC615 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-023	QC615 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-033	BLANK FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-034	BLANK FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-010	MW69 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-012	MW401 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-014	IT3S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-016	IT3M FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-018	IT3D FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-020	MW198 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-022	QC618 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-009	MW69 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-011	MW401 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-013	IT3S FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-015	IT3M FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-017	IT3D FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-019	MW198 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104161-021	QC618 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-024	QC615 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104161-023	QC615 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-008	QC615	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-001	MW69	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-005	IT3D	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-002	MW401	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-008	QC615	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-001	MW69	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-005	IT3D	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-002	MW401	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-008	QC615	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104161-005	IT3D	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-008	QC615	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-001	MW69	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-005	IT3D	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-002	MW401	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-008	QC615	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-001	MW69	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-005	IT3D	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-008	QC615	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104161-005	IT3D	**4-Terphenyl-d14**	1718-51-0	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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1104220**	Page	: 1 of 14
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE PIGRAM	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.pigram@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 28-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Site	: ----		
		No. of samples received	: 21
Quote number	: SY/418/10 V2	No. of samples analysed	: 21

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG035F: Positive mercury results have been confirmed for ES1104220 #4 by re-analysis.**
- **EG094 : LCS recovery for some elements falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG094: Results for samples ES1104220-5 and ES1104220-6have been confirmed.**
- **EK025: FCN result has been adjusted to reflect thiocyanate interference on sample ID MW204S and MW200**
- **EK025: Poor matrix spike recovery for sample ID MW210 on FCN due to sample matrrix. Confirmed by re-extraction and re-analysis.**
- **EP075(SIM): Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogate is not determined.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP132 : Insufficient sample has been provided for standard analysis. Where applicable LOR values have been adjusted accordingly.**
- **EP132: Particular samples (filter paper) required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Surrogates not determined due to sample matrix interfernces.**
- **EP132: Positive results have been reported for Naphthalene in sample #21 Blank Filtrate due to carry over from other contaminated samples in this work order. Due to limited sample volume filtration and analysis could not be repeated.**
- **Samples 7 to 21 were produced in a filtering procedure requested by AECOM. Where requested a 500mL amber glass unpreserved bottle was filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter'. This filter paper was then analysed and is labeled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper. The second filter paper was then analysed and is labeled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample.**
  Before filtering any samples in each work order, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW204SFP1	MW204S FP2	MW208 FP1	MW208 FP2	MW209 FP1
				Client sampling date / time: 25-FEB-2011 16:10	25-FEB-2011 16:10	28-FEB-2011 09:10	28-FEB-2011 09:10	28-FEB-2011 11:10
				ES1104220-007	ES1104220-008	ES1104220-009	ES1104220-010	ES1104220-011
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	10	µg/filter	**790**	**430**	**20**	<10	**20**
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthene	83-32-9	10	µg/filter	**330**	**190**	**20**	<10	**80**
Acenaphthylene	208-96-8	10	µg/filter	**140**	**90**	<10	<10	**460**
Anthracene	120-12-7	10	µg/filter	**40**	<10	<10	<10	**200**
Benz(a)anthracene	56-55-3	10	µg/filter	<10	<10	<10	<10	**590**
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	<10	<10	<10	**720**
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<10	<10	<10	**500**
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<10	<10	<10	**350**
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<10	<10	<10	**190**
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<10	<10	<10	**260**
Chrysene	218-01-9	10	µg/filter	<10	<10	<10	<10	**420**
Coronene	191-07-1	10	µg/filter	<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<10	<10	<10	**40**
Fluoranthene	206-44-0	10	µg/filter	**40**	<10	**20**	<10	**400**
Fluorene	86-73-7	10	µg/filter	**460**	**90**	**20**	<10	**100**
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<10	<10	<10	**150**
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	<100
Naphthalene	91-20-3	10	µg/filter	**13400**	**14400**	**110**	**20**	**210**
Perylene	198-55-0	10	µg/filter	<10	<10	<10	<10	**100**
Phenanthrene	85-01-8	10	µg/filter	**610**	**30**	**50**	<10	**290**
Pyrene	129-00-0	10	µg/filter	**20**	<10	**10**	<10	**540**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW209 FP2	MW200 FP1	MW200 FP2	BLANK FP1	BLANK FP2
				Client sampling date / time: 28-FEB-2011 11:10	28-FEB-2011 10:10	28-FEB-2011 10:10	28-FEB-2011 10:10	28-FEB-2011 10:10
				ES1104220-012	ES1104220-013	ES1104220-014	ES1104220-019	ES1104220-020
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	**680**	**90**	<10	<10
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthene	83-32-9	10	µg/filter	<10	**40**	<10	<10	<10
Acenaphthylene	208-96-8	10	µg/filter	<10	**140**	**30**	<10	<10
Anthracene	120-12-7	10	µg/filter	<10	**10**	<10	<10	<10
Benz(a)anthracene	56-55-3	10	µg/filter	<10	<10	<10	<10	<10
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	<10	<10	<10	<10
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<10	<10	<10	<10
Chrysene	218-01-9	10	µg/filter	<10	<10	<10	<10	<10
Coronene	191-07-1	10	µg/filter	<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	10	µg/filter	<10	<10	<10	<10	<10
Fluorene	86-73-7	10	µg/filter	<10	**120**	<10	<10	<10
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<10	<10	<10	<10
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	<100
Naphthalene	91-20-3	10	µg/filter	<10	**11200**	**1810**	<10	<10
Perylene	198-55-0	10	µg/filter	<10	<10	<10	<10	<10
Phenanthrene	85-01-8	10	µg/filter	<10	**80**	<10	<10	<10
Pyrene	129-00-0	10	µg/filter	<10	<10	<10	<10	<10
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW204S Client sampling date / time: 25-FEB-2011 16:10 ES1104220-001	Client sample ID: MW208 Client sampling date / time: 28-FEB-2011 09:10 ES1104220-002	Client sample ID: MW209 Client sampling date / time: 28-FEB-2011 11:10 ES1104220-003	Client sample ID: MW200 Client sampling date / time: 28-FEB-2011 10:10 ES1104220-004	Client sample ID: QC619 Client sampling date / time: 25-FEB-2011 15:00 ES1104220-005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	**0.0002**	<0.0001
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	----	**30**	**10**	----	----
Selenium	7782-49-2	2	µg/L	----	<2	<2	----	----
Antimony	7440-36-0	0.5	µg/L	----	**0.8**	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	----	**8.2**	**1.1**	----	----
Barium	7440-39-3	1	µg/L	----	**1670**	**48**	----	----
Beryllium	7440-41-7	0.1	µg/L	----	<0.1	**0.1**	----	----
Cadmium	7440-43-9	0.2	µg/L	----	**0.2**	**0.5**	----	----
Chromium	7440-47-3	0.5	µg/L	----	<0.5	<0.5	----	----
Cobalt	7440-48-4	0.2	µg/L	----	**0.5**	**0.3**	----	----
Copper	7440-50-8	1	µg/L	----	<1	<1	----	----
Lead	7439-92-1	0.2	µg/L	----	<0.2	<0.2	----	----
Manganese	7439-96-5	0.5	µg/L	----	**235**	**18.0**	----	----
Nickel	7440-02-0	0.5	µg/L	----	**9.5**	**55.7**	----	----
Silver	7440-22-4	0.1	µg/L	----	<0.1	**0.3**	----	----
Vanadium	7440-62-2	0.5	µg/L	----	**1.5**	**1.0**	----	----
Zinc	7440-66-6	5	µg/L	----	**6**	**6**	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**50**	----	----	**14**	<5
Antimony	7440-36-0	0.2	µg/L	**0.5**	----	----	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	**0.5**	----	----	**1.3**	<0.2
Arsenic	7440-38-2	0.2	µg/L	**2.0**	----	----	**5.3**	<0.2
Barium	7440-39-3	0.5	µg/L	**85.4**	----	----	**85.4**	<0.5
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	<0.1	<0.1
Cadmium	7440-43-9	0.05	µg/L	**0.78**	----	----	**0.11**	**0.25**
Chromium	7440-47-3	0.2	µg/L	**1.0**	----	----	**0.9**	<0.2
Cobalt	7440-48-4	0.1	µg/L	**1.2**	----	----	**1.5**	<0.1
Copper	7440-50-8	0.5	µg/L	**3.1**	----	----	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L	**0.4**	----	----	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L	**99.0**	----	----	**850**	<0.5
Nickel	7440-02-0	0.5	µg/L	**72.1**	----	----	**46.4**	<0.5
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	<0.1	<0.1
Vanadium	7440-62-2	0.2	µg/L	**4.7**	----	----	**2.8**	<0.2
Zinc	7440-66-6	1	µg/L	**19**	----	----	**8**	<1
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW204S Client sampling date / time: 25-FEB-2011 16:10 ES1104220-001	Client sample ID: MW208 Client sampling date / time: 28-FEB-2011 09:10 ES1104220-002	Client sample ID: MW209 Client sampling date / time: 28-FEB-2011 11:10 ES1104220-003	Client sample ID: MW200 Client sampling date / time: 28-FEB-2011 10:10 ES1104220-004	Client sample ID: QC619 Client sampling date / time: 25-FEB-2011 15:00 ES1104220-005
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser - Continued								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<10.0	<1.0	<1.0	**836**	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<10.0	**15.0**	<1.0	**6900**	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<20.0	**10.4**	<2.0	**3640**	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	**61.4**	**16.4**	**1.2**	**8690**	<1.0
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<20.0	<2.0	<2.0	<196	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	**8580**	**7.9**	**10.8**	**5450**	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	**45.4**	<1.0	**6.2**	<98.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	**85.5**	**2.1**	**1.8**	<98.0	<1.0
Fluorene	86-73-7	1.0	µg/L	**80.6**	**2.2**	<1.0	<98.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	**54.6**	**3.1**	**2.0**	<98.0	<1.0
Anthracene	120-12-7	1.0	µg/L	<10.0	**1.9**	**1.0**	<98.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<10.0	<1.0	**1.2**	<98.0	<1.0
Pyrene	129-00-0	1.0	µg/L	<10.0	<1.0	**1.8**	<98.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<10.0	<1.0	**1.0**	<98.0	<1.0
Chrysene	218-01-9	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<10.0	<0.5	**0.8**	<98.0	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<10.0	<1.0	<1.0	<98.0	<1.0
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**2380**	<20	**100**	**37600**	<20
C10 - C14 Fraction	----	50	µg/L	**8430**	**560**	**100**	**47400**	<50
C15 - C28 Fraction	----	100	µg/L	**2690**	**2110**	**220**	**17200**	<100
C29 - C36 Fraction	----	50	µg/L	**130**	**160**	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	**11200**	**2830**	**320**	**64600**	<50
EP080: BTEX								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: MW204S Client sampling date / time: 25-FEB-2011 16:10 ES1104220-001	Client sample ID: MW208 Client sampling date / time: 28-FEB-2011 09:10 ES1104220-002	Client sample ID: MW209 Client sampling date / time: 28-FEB-2011 11:10 ES1104220-003	Client sample ID: MW200 Client sampling date / time: 28-FEB-2011 10:10 ES1104220-004	Client sample ID: QC619 Client sampling date / time: 25-FEB-2011 15:00 ES1104220-005
EP080: BTEX - Continued								
Benzene	71-43-2	1	µg/L	**237**	**6**	**56**	**17900**	<1
Toluene	108-88-3	2	µg/L	**440**	<5	**5**	**1660**	<5
Ethylbenzene	100-41-4	2	µg/L	**169**	**2**	**15**	**659**	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	**466**	**2**	**8**	**1350**	<2
ortho-Xylene	95-47-6	2	µg/L	**229**	**2**	**10**	**560**	<2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**14.4**	**14.8**	**Not Determined**	**16.1**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**23.7**	**55.2**	**Not Determined**	**43.6**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**68.6**	**45.2**	**Not Determined**	**51.8**
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**35.2**	**28.2**	**Not Determined**	**45.3**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**48.2**	**29.0**	**Not Determined**	**54.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**51.7**	**49.6**	**Not Determined**	**60.7**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**99.7**	**89.8**	**83.5**	**93.4**
Toluene-D8	2037-26-5	0.1	%	**88.5**	**87.4**	**96.0**	**81.7**	**86.9**
4-Bromofluorobenzene	460-00-4	0.1	%	**89.6**	**86.6**	**85.7**	**80.0**	**83.2**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC620	MW204 FILTRATE	MW208 FILTRATE	MW209 FILTRATE	MW200 FILTRATE
				Client sampling date / time: [28-FEB-2011]	25-FEB-2011 16:10	28-FEB-2011 09:10	28-FEB-2011 11:10	28-FEB-2011 10:10
				ES1104220-006	ES1104220-015	ES1104220-016	ES1104220-017	ES1104220-018
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	**6**	----	----	----	----
Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L	<0.2	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	<0.2	----	----	----	----
Barium	7440-39-3	0.5	µg/L	<0.5	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L	**1.26**	----	----	----	----
Chromium	7440-47-3	0.2	µg/L	<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L	<0.1	----	----	----	----
Copper	7440-50-8	0.5	µg/L	<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L	<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L	<0.5	----	----	----	----
Nickel	7440-02-0	0.5	µg/L	<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L	<0.1	----	----	----	----
Vanadium	7440-62-2	0.2	µg/L	<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L	**6**	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	QC620 [28-FEB-2011] ES1104220-006	MW204 FILTRATE 25-FEB-2011 16:10 ES1104220-015	MW208 FILTRATE 28-FEB-2011 09:10 ES1104220-016	MW209 FILTRATE 28-FEB-2011 11:10 ES1104220-017	MW200 FILTRATE 28-FEB-2011 10:10 ES1104220-018
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<5	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	----	<0.10	**0.57**	<0.10	<1.00
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	----	<0.10	**0.11**	<0.10	<1.00
m-Cresol	108-39-4	0.1	µg/L	----	**3.2**	**14.5**	**0.5**	**1700**
o-Cresol	95-48-7	0.1	µg/L	----	**24.3**	**22.2**	**0.6**	**4240**
p-Cresol	106-44-5	0.1	µg/L	----	**6.1**	**1.9**	<0.2	**140**
2.4-Dichlorophenol	120-83-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
2.6-Dichlorophenol	87-65-0	0.1	µg/L	----	<0.2	**0.5**	<0.2	<2.0
2.4-Dimethylphenol	105-67-9	0.1	µg/L	----	**56.6**	**17.9**	**0.4**	**3180**
Hexachlorophene	70-30-4	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
2-Nitrophenol	88-75-5	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
4-Nitrophenol	100-02-7	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
Pentachlorophenol	87-86-5	0.05	µg/L	----	<0.10	<0.10	<0.10	<1.00
Phenol	108-95-2	0.1	µg/L	----	**2.2**	**2.3**	**1.1**	**472**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	QC620	MW204 FILTRATE	MW208 FILTRATE	MW209 FILTRATE	MW200 FILTRATE
Client sample ID				QC620	MW204 FILTRATE	MW208 FILTRATE	MW209 FILTRATE	MW200 FILTRATE
Client sampling date / time				[28-FEB-2011]	25-FEB-2011 16:10	28-FEB-2011 09:10	28-FEB-2011 11:10	28-FEB-2011 10:10
				ES1104220-006	ES1104220-015	ES1104220-016	ES1104220-017	ES1104220-018
EP132A: Phenolic Compounds - Continued								
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	----	<0.2	<0.2	<0.2	<2.0
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
2-Methylnaphthalene	91-57-6	0.1	µg/L	----	**19.5**	**0.3**	<0.1	**45.8**
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Acenaphthene	83-32-9	0.1	µg/L	----	**10.9**	**0.7**	<0.1	**6.4**
Acenaphthylene	208-96-8	0.1	µg/L	----	**5.1**	**0.3**	<0.1	**20.2**
Anthracene	120-12-7	0.1	µg/L	----	<0.1	**0.4**	<0.1	<1.0
Benz(a)anthracene	56-55-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Benzo(a)pyrene	50-32-8	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.50
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Benzo(e)pyrene	192-97-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Chrysene	218-01-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Coronene	191-07-1	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Fluoranthene	206-44-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Fluorene	86-73-7	0.1	µg/L	----	**0.8**	<0.1	<0.1	<1.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Naphthalene	91-20-3	0.1	µg/L	----	**1100**	**9.7**	**2.0**	**2970**
Perylene	198-55-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Phenanthrene	85-01-8	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
Pyrene	129-00-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<1.0
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**14.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**39.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**58.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**38.7**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**41.5**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**59.3**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**92.2**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**81.8**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: QC620	MW204 FILTRATE	MW208 FILTRATE	MW209 FILTRATE	MW200 FILTRATE
				Client sampling date / time: [28-FEB-2011]	25-FEB-2011 16:10	28-FEB-2011 09:10	28-FEB-2011 11:10	28-FEB-2011 10:10
				ES1104220-006	ES1104220-015	ES1104220-016	ES1104220-017	ES1104220-018
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	----	**37.7**	**64.6**	**42.8**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	----	**33.6**	**42.5**	**28.3**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	**49.8**	**109**	**99.7**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**101**	**84.6**	**73.1**	**75.7**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	**85.6**	**82.8**	**120**	**80.1**
Anthracene-d10	1719-06-8	0.1	%	----	**89.7**	**100**	**93.2**	**106**
4-Terphenyl-d14	1718-51-0	0.1	%	----	**79.7**	**97.9**	**94.6**	**93.7**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: BLANK FILTRATE	----	----	----	----
				Client sampling date / time: 28-FEB-2011 11:10	----	----	----	----
				ES1104220-021	----	----	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.10	----	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.10	----	----	----	----
m-Cresol	108-39-4	0.1	µg/L	<0.2	----	----	----	----
o-Cresol	95-48-7	0.1	µg/L	<0.2	----	----	----	----
p-Cresol	106-44-5	0.1	µg/L	<0.2	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.2	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.2	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.2	----	----	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.2	----	----	----	----
2-Nitrophenol	88-75-5	0.1	µg/L	<0.2	----	----	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.2	----	----	----	----
Pentachlorophenol	87-86-5	0.05	µg/L	<0.10	----	----	----	----
Phenol	108-95-2	0.1	µg/L	<0.2	----	----	----	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.2	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.2	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.2	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	----	----	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	----	----	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	----	----	----	----
Acenaphthene	83-32-9	0.1	µg/L	<0.1	----	----	----	----
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	----	----	----	----
Anthracene	120-12-7	0.1	µg/L	<0.1	----	----	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	----	----	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	----	----	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	----	----	----	----
Chrysene	218-01-9	0.1	µg/L	<0.1	----	----	----	----
Coronene	191-07-1	0.1	µg/L	<0.1	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	----	----	----	----
Fluoranthene	206-44-0	0.1	µg/L	<0.1	----	----	----	----
Fluorene	86-73-7	0.1	µg/L	<0.1	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	----	----	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	----	----	----	----
Naphthalene	91-20-3	0.1	µg/L	**0.7**	----	----	----	----
Perylene	198-55-0	0.1	µg/L	<0.1	----	----	----	----

Analytical Results

Sub-Matrix: WATER				Client sample ID	BLANK FILTRATE	----	----	----	----
				Client sampling date / time	28-FEB-2011 11:10	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1104220-021	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Phenanthrene	85-01-8	0.1	µg/L		<0.1	----	----	----	----
Pyrene	129-00-0	0.1	µg/L		<0.1	----	----	----	----
EP132S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**52.2**	----	----	----	----
Phenol-d6	13127-88-3	0.1	%		**31.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**127**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**76.8**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**124**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		**88.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**81.1**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **FILTER PAPER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

COC #3

AECOM

Chain of Custody

AECOM - Sydney		**Laboratory Details**	Tel: 8784 8555
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999	Lab. Name: ALS	Fax:
	Fax: 61 2 8484 8989	Lab. Address:277 Woodpark Road, Smithfield NSW 2164	Preliminary Report by: 5 1
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com		Final Report by:
		Contact Name:	Lab Quote No: **SY/418/10 V2**
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1	Project Name: Barangaroo VMP DGI	PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy / Email : _____	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Metals (M13) (ultratrace)	As, Sb, Se, Ag (ultratrace)	TPH / BTEX	PAHs / Phenols	Free & WAD cyanide	2x lab filtered ultratrace PAHs phenols	Other
1	MW204S	25-2-11	16:10		X				X		2A, 2V, 2P	X	X	X	X	✓	X	* Please analyse sediments on filter paper for each sample where possible for PAHs only
(5) (6) 1801	QC619	25-2-11	—		X				X		1A, 2V, 2P	X	X	X	X		▨	
2	MW08	28-2-11	09:10		X				X		2A, 2P, 2V	X	X	X	X	X	X	
3	MW209	28-2-11	11:10		X				X		↓	X	X	X	X	X	X	
4	MW200	28-2-11	10:10		X				X			X	X	X	X	X	X	
(6)	QC620	28-2-11	—		X				X		1A, 2V, 2P	X	X	X	X		▨	

* please hold cyanide bottle for QC619 & QC620

Environmental Division Sydney

Work Order

ES1104220

Telephone : +61-2-8784 8555

Samples 5 & 6 → Cannot conduct the lab filtering procedure due to insufficient volume.

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: A=amber, P=plastic, V= vials.

Lab Report No. | Esky ID

Relinquished by: Lauren Kontus | Signed: | Date: 28-2-11

Printed copies of this document are uncontrolled | Page 1 of 1 | Date: 28/08/2010

Relinquished by: | Signed: | Date:

Recieved by: | Signed: | Date:

Recieved by: SAMAL 28/2/11 | Signed: | 17:00

Revision: Jun 08

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1104220**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0391 (SY/418/10 V2)
Site	: ----		
Sampler	: LK/KO	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 28-FEB-2011	Issue Date	: 03-MAR-2011 18:31
Client Requested Due Date	: 07-MAR-2011	Scheduled Reporting Date	: **07-MAR-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 5.4'C - Ice present
No. of coolers/boxes	: 1 HARD	No. of samples received	: 21
Security Seal	: Intact.	No. of samples analysed	: 21

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **The filtering procedure will not be conducted on samples 5 and 6 due to insufficient volume of sample.**
- **500mL amber bottles to be lab filtered twice before analysis. The first and second filter paper for each sample is to be analysed as seperate samples for Ultra Trace PAH.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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
EP132 : Semivolatile Compounds by GCMS(SIM - Ultra-trace)		
MW204SFP1	- Personal Filter	- Soil Glass Jar - Unpreserved
MW204S FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
MW208 FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
MW208 FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
MW209 FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
MW209 FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
MW200 FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
MW200 FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
BLANK FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
BLANK FP2	- Personal Filter	- Soil Glass Jar - Unpreserved

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 - EP132B Ultratrace PAH's
ES1104220-007	25-FEB-2011 16:10	MW204SFP1	✓
ES1104220-008	25-FEB-2011 16:10	MW204S FP2	✓
ES1104220-009	28-FEB-2011 09:10	MW208 FP1	✓
ES1104220-010	28-FEB-2011 09:10	MW208 FP2	✓
ES1104220-011	28-FEB-2011 11:10	MW209 FP1	✓
ES1104220-012	28-FEB-2011 11:10	MW209 FP2	✓
ES1104220-013	28-FEB-2011 10:10	MW200 FP1	✓
ES1104220-014	28-FEB-2011 10:10	MW200 FP2	✓
ES1104220-019	28-FEB-2011 10:10	BLANK FP1	✓
ES1104220-020	28-FEB-2011 10:10	BLANK FP2	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by ORC-ICPMS	WATER - EG094B-F Dissolved Metals in fresh water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1104220-001	25-FEB-2011 16:10	MW204S	✓	✓	✓	✓	✓		✓
ES1104220-002	28-FEB-2011 09:10	MW208	✓	✓	✓	✓	✓		✓
ES1104220-003	28-FEB-2011 11:10	MW209	✓	✓	✓	✓	✓		✓
ES1104220-004	28-FEB-2011 10:10	MW200	✓	✓	✓	✓	✓		✓
ES1104220-005	25-FEB-2011 15:00	QC619	✓	✓	✓				✓

			WATER - EG035F Dissolved Mercury by FIMS	WATER - EG094A-F Dissolved Metals in Fresh Water Suite A by ORC-ICPMS	WATER - EG094B-F Dissolved Metals in fresh water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-24 TPH/BTEX/PAH/Phenols
ES1104220-006	[28-FEB-2011]	QC620	✓	✓	✓				✓
ES1104220-015	25-FEB-2011 16:10	MW204 FILTRATE						✓	
ES1104220-016	28-FEB-2011 09:10	MW208 FILTRATE						✓	
ES1104220-017	28-FEB-2011 11:10	MW209 FILTRATE						✓	
ES1104220-018	28-FEB-2011 10:10	MW200 FILTRATE						✓	
ES1104220-021	28-FEB-2011 11:10	BLANK FILTRATE						✓	

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountsenv@aecom.com

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS JENNIFER CULLEN

- Chain of Custody (CoC) (COC)	Email	jennifer.cullen@alsenviro.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

MS KATE PIGRAM

- *AU Certificate of Analysis - NATA (COA)	Email	kate.pigram@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.pigram@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.pigram@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.pigram@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.pigram@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.pigram@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.pigram@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.pigram@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.pigram@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1104220**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
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Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 21
Quote number	: SY/418/10 V2	No. of samples analysed	: 21

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*
Ankit Joshi	Inorganic Chemist	Inorganics
Celine Conceicao	Spectroscopist	Inorganics
Edwandy Fadjar	Senior Organic Chemist	Organics
Pabi Subba	Senior Organic Chemist	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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035F: Dissolved Mercury by FIMS (QC Lot: 1691989)									
EB1103698-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1104220-005	QC619	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695997)									
ES1104095-001	Anonymous	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.5	1.3	13.1	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	1810	1860	2.8	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	164	170	3.4	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	75	75	0.0	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	<10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	16	18	7.8	No Limit
ES1104220-003	MW209	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	0.3	<0.1	110	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.5	0.5	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.1	1.1	0.0	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	18.0	18.2	1.2	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	55.7	58.0	4.0	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.0	1.1	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	48	47	3.1	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	<1	<1	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	10	10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	6	6	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998)									
ES1104095-001	Anonymous	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1695998) - continued									
ES1104220-003	MW209	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693912)									
EB1103525-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.2	0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.8	0.8	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	59.7	57.7	3.5	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	0.9	1.0	15.2	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	2.0	2.1	6.7	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	<1	<1	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	59	52	12.5	0% - 50%
ES1104161-006	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	1.00	1.03	3.2	0% - 20%
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	3.8	4.0	2.9	0% - 20%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	1.1	1.0	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.7	0.7	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	52.5	52.2	0.5	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	103	105	1.8	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	69.1	67.9	1.8	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	8	8	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	21	22	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1693913)									
EB1103525-001	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.4	0.3	0.0	No Limit
ES1104161-006	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1691656)									
ES1104095-001	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650)									

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 (%)
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1691650) - continued									
ES1104095-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1104161-007	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1692312)									
ES1104095-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1104105-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEX (QC Lot: 1692312)									
ES1104095-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	2	2	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	3	3	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
ES1104105-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	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: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691178)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	102	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	76.5	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	45.5	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	77.9	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	94.7	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	74.8	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	77.2	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	81.9	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	82.4	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	109	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	80.0	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	111	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	85.7	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	52.8	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	72.4	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	76.6	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	78.8	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	70.4	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	1000 µg/kg	# 40.5	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	80.9	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	85.6	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	79.4	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	75.8	67.9	127

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
EG035F: Dissolved Mercury by FIMS (QCLot: 1691989)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	105	86	116
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)								
EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	50 µg/L	96.7	80	128
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	97.4	85	125
EG093A-F: Barium	7440-39-3	1	µg/L	<1	10 µg/L	87.7	81	129
EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	93.5	80	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997) - continued								
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	83.4	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	104	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	97.9	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	107	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	87.2	87	123
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	97.5	90	122
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	84	124
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	81.9	70	130
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	90.2	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	95.0	82	128
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695998)								
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	82.9	74	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693912)								
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	102	78	132
EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	99.4	86	124
EG094A-F: Barium	7440-39-3	0.5	µg/L	<0.5	10 µg/L	101	71	125
EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	101	73	127
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	86.2	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.8	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	102	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	102	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	89.2	82	120
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	101	82	126
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	102	86	122
EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	72.0	61	125
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	# 80.2	83	117
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	103	79	133
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693913)								
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	96.1	75	123
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	89.8	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	95.2	70	129
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	.5 µg/L	27.4	24.5	61.9
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)A: Phenolic Compounds (QCLot: 1691163) - continued								
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	.5 µg/L	# 62.4	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	.5 µg/L	56.4	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	1 µg/L	53.6	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	.5 µg/L	87.2	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	.5 µg/L	99.6	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	.5 µg/L	95.8	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	.5 µg/L	68.2	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	.5 µg/L	63.8	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	.5 µg/L	65.8	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	.5 µg/L	63.5	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	1 µg/L	66.2	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	.5 µg/L	63.2	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	.5 µg/L	63.8	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	.5 µg/L	# 62.1	62.2	113
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	.5 µg/L	64.4	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	.5 µg/L	71.8	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	.5 µg/L	67.1	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	.5 µg/L	# 63.2	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	.5 µg/L	65.1	63.1	118
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691163) - continued								
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	.5 µg/L	73.0	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	.5 µg/L	71.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	.5 µg/L	74.7	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	.5 µg/L	94.2	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	.5 µg/L	69.7	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	.5 µg/L	77.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	.5 µg/L	74.4	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	.5 µg/L	72.8	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1691162)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	62.5	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	400 µg/L	77.5	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	73.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692312)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	107	75	127
EP080: BTEX (QCLot: 1692312)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	107	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	98.5	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	99.4	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	96.8	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	99.6	73	121
EP132A: Phenolic Compounds (QCLot: 1691161)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	101	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	105	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	66.0	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	71.4	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	60.3	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	107	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	108	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	103	40	128

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
EP132A: Phenolic Compounds (QCLot: 1691161) - continued								
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	# 116	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	104	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	59.6	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	# 96.8	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	37.2	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	99.6	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	102	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	108	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1691161)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	113	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	85.8	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	51.4	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	93.3	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	97.8	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	97.5	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	97.7	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	103	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	92.4	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	# 121	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	99.2	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	104	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	101	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	76.1	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	102	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	99.4	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	99.7	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	101	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	107	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	79.9	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	85.7	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	97.5	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	98.9	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1691989)							
EB1103698-005	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	101	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1695997)							
ES1104095-001	Anonymous	EG093A-F: Arsenic	7440-38-2	50 µg/L	88.4	70	130
		EG093A-F: Barium	7440-39-3	50 µg/L	110	70	130
		EG093A-F: Beryllium	7440-41-7	50 µg/L	74.2	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	86.7	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	92.7	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	97.3	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	97.3	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	97.2	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	71.5	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	118	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	87.8	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1693912)							
EB1103525-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	108	70	130
		EG094A-F: Barium	7440-39-3	50 µg/L	99.3	70	130
		EG094A-F: Beryllium	7440-41-7	50 µg/L	98.6	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	75.7	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	87.5	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	98.2	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	96.2	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	72.2	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	92.6	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	95.2	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	92.2	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	102	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1691656)							
ES1104095-001	Anonymous	EK025G: Free Cyanide	----	0.2 mg/L	# 47.3	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1691650)							
ES1104095-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	70.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1692312)							
ES1104095-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	82.6	70	130
EP080: BTEX (QCLot: 1692312)							

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*
EP080: BTEX (QCLot: 1692312) - continued							
ES1104095-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	89.8	70	130
		EP080: Toluene	108-88-3	25 µg/L	86.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	79.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	84.2	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	78.9	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1104220**	Page	: 1 of 12
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531 6 1 BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 28-FEB-2011
Sampler	: LK/KO	Issue Date	: 10-MAR-2011
Order number	: 39540AUS		
		No. of samples received	: 21
Quote number	: SY/418/10 V2	No. of samples analysed	: 21

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Personal Filter MW204SFP1, MW204S FP2	**25-FEB-2011**	**02-MAR-2011**	11-MAR-2011	✓	**06-MAR-2011**	11-APR-2011	✓
Personal Filter MW208 FP1, MW208 FP2, MW209 FP1, MW209 FP2, MW200 FP1, MW200 FP2, BLANK FP1, BLANK FP2	**28-FEB-2011**	**02-MAR-2011**	14-MAR-2011	✓	**06-MAR-2011**	11-APR-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
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW204S, QC619	**25-FEB-2011**	**---**	25-MAR-2011	----	**03-MAR-2011**	25-MAR-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW208, MW209, MW200, QC620	**28-FEB-2011**	**---**	28-MAR-2011	----	**03-MAR-2011**	28-MAR-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW208, MW209	**28-FEB-2011**	**07-MAR-2011**	27-AUG-2011	✓	**07-MAR-2011**	27-AUG-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW204S, QC619	**25-FEB-2011**	**04-MAR-2011**	24-AUG-2011	✓	**04-MAR-2011**	24-AUG-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered MW200, QC620	**28-FEB-2011**	**04-MAR-2011**	27-AUG-2011	✓	**04-MAR-2011**	27-AUG-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW204S	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW208, MW209, MW200	**28-FEB-2011**	**03-MAR-2011**	14-MAR-2011	✓	**03-MAR-2011**	14-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
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW204S	**25-FEB-2011**	**03-MAR-2011**	11-MAR-2011	✓	**03-MAR-2011**	11-MAR-2011	✓
White Plastic Bottle-NaOH (Cd Nitrate Optional) MW208, MW209, MW200	**28-FEB-2011**	**03-MAR-2011**	14-MAR-2011	✓	**03-MAR-2011**	14-MAR-2011	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved MW204S, QC619	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW208, MW209, MW200, QC620	**28-FEB-2011**	**02-MAR-2011**	07-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved MW204S, QC619	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW208, MW209, MW200, QC620	**28-FEB-2011**	**02-MAR-2011**	07-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved MW204S, QC619	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW208, MW209, MW200, QC620	**28-FEB-2011**	**02-MAR-2011**	07-MAR-2011	✓	**04-MAR-2011**	11-APR-2011	✓
Amber VOC Vial - HCl MW204S, QC619	**25-FEB-2011**	**04-MAR-2011**	11-MAR-2011	✓	**04-MAR-2011**	11-MAR-2011	✓
Amber VOC Vial - HCl MW208, MW209, MW200, QC620	**28-FEB-2011**	**04-MAR-2011**	14-MAR-2011	✓	**04-MAR-2011**	14-MAR-2011	✓
EP080: BTEX							
Amber VOC Vial - HCl MW204S, QC619	**25-FEB-2011**	**04-MAR-2011**	11-MAR-2011	✓	**04-MAR-2011**	11-MAR-2011	✓
Amber VOC Vial - HCl MW208, MW209, MW200, QC620	**28-FEB-2011**	**04-MAR-2011**	14-MAR-2011	✓	**04-MAR-2011**	14-MAR-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved MW204 FILTRATE	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW208 FILTRATE, MW209 FILTRATE, MW200 FILTRATE, BLANK FILTRATE	**28-FEB-2011**	**02-MAR-2011**	07-MAR-2011	✓	**03-MAR-2011**	11-APR-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
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved MW204 FILTRATE	**25-FEB-2011**	**02-MAR-2011**	04-MAR-2011	✓	**03-MAR-2011**	11-APR-2011	✓
Amber Glass Bottle - Unpreserved MW208 FILTRATE, MW209 FILTRATE, MW200 FILTRATE, BLANK FILTRATE	**28-FEB-2011**	**02-MAR-2011**	07-MAR-2011	✓	**03-MAR-2011**	11-APR-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 Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	10	20.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	2	10	20.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	2	11	18.2	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	15	13.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	19	10.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	18	11.1	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	10	10.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	11	9.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	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	19	5.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	10	**10.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	11	**9.1**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	15	**6.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	18	**5.6**	**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
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
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)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. 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)

Analytical Methods	Method	Matrix	Method Descriptions
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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							
EP132B: Polynuclear Aromatic Hydrocarbons	1987030-002	----	**N-2-Fluorenyl Acetamide**	53-96-3	40.5 %	50-138%	**Recovery less than lower control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	1990389-003	----	**Vanadium**	7440-62-2	80.2 %	83-117%	**Recovery less than lower control limit**
EP075(SIM)A: Phenolic Compounds	1987002-007	----	**2-Chlorophenol**	95-57-8	62.4 %	63.8-110%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Acenaphthene**	83-32-9	62.1 %	62.2-113%	**Recovery less than lower control limit**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	1987002-007	----	**Fluoranthene**	206-44-0	63.2 %	63.6-118%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Hexachlorophene**	70-30-4	116 %	24.4-102%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	1987000-002	----	**Pentachlorophenol**	87-86-5	96.8 %	32.6-89.4%	**Recovery greater than upper control limit**
EP132B: Polynuclear Aromatic Hydrocarbons	1987000-002	----	**Benzo(e)pyrene**	192-97-2	121 %	75.3-118%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EG093F: Dissolved Metals in Saline Water by ORC-ICP	ES1104095-001	Anonymous	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK025G: Free cyanide by Discrete Analyser	ES1104095-001	Anonymous	**Free Cyanide**	----	47.3 %	70-130%	**Recovery less than lower data quality objective**

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

Regular Sample Surrogates

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES1104220-019	BLANK FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-020	BLANK FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-007	MW204SFP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-009	MW208 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104220-011	MW209 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-013	MW200 FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-008	MW204S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-010	MW208 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-012	MW209 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-014	MW200 FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-019	BLANK FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-020	BLANK FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-007	MW204SFP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-009	MW208 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-011	MW209 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-013	MW200 FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-008	MW204S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-010	MW208 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-012	MW209 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-014	MW200 FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-019	BLANK FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-020	BLANK FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-007	MW204SFP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-009	MW208 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-011	MW209 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-013	MW200 FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1104220-008	MW204S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-010	MW208 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-012	MW209 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-014	MW200 FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-004	MW200	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-001	MW204S	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-004	MW200	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-001	MW204S	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-004	MW200	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)S: Phenolic Compound Surrogates	ES1104220-001	MW204S	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-004	MW200	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-001	MW204S	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-004	MW200	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-001	MW204S	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-004	MW200	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075(SIM)T: PAH Surrogates	ES1104220-001	MW204S	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1104220-018	MW200 FILTRATE	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1104220-018	MW200 FILTRATE	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1104220-018	MW200 FILTRATE	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-021	BLANK FILTRATE	**2-Fluorobiphenyl**	321-60-8	124 %	43-116 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1104220-017	MW209 FILTRATE	**2-Fluorobiphenyl**	321-60-8	120 %	43-116 %	**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.**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1108478**	Page	: 1 of 9
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531-6 1BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 20-APR-2011
Sampler	: DS	Issue Date	: 02-MAY-2011
Site	: ----		
		No. of samples received	: 8
Quote number	: SY/418/10 V2	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 Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control 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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Organics Co-ordinator	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG094: LCS recovery for some elements falls outside ALS Dynamic Control Limit. However, they are within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG094: Positive results for Zinc have been confirmed.**
- **EP080: Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP080: Results of IT07_SHALLOW, IT06_SHALLOW and IT06_DEEP have been confirmed by reanalysis.**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT07_SHALLOW	IT07_MID	IT07_DEEP	IT06_SHALLOW	IT06_MID
				Client sampling date / time: 19-APR-2011 15:00	19-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	20-APR-2011 15:00
				ES1108478-001	ES1108478-002	ES1108478-003	ES1108478-004	ES1108478-005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	**10**	**20**	**10**	<10	**10**
Selenium	7782-49-2	2	µg/L	<2	<2	<2	<2	<2
Antimony	7440-36-0	0.5	µg/L	**2.6**	**1.9**	<0.5	<0.5	**0.6**
Arsenic	7440-38-2	0.5	µg/L	**1.6**	**1.6**	**2.4**	**1.1**	**0.9**
Barium	7440-39-3	1	µg/L	**68**	**49**	**189**	**152**	**50**
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.2	µg/L	**0.4**	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L	**14.1**	**2.4**	**1.9**	**1.5**	**0.6**
Copper	7440-50-8	1	µg/L	**4**	<1	<1	<1	<1
Lead	7439-92-1	0.2	µg/L	**2.8**	**0.9**	**0.5**	**0.2**	**0.6**
Manganese	7439-96-5	0.5	µg/L	**41.9**	**46.5**	**254**	**244**	**43.8**
Nickel	7440-02-0	0.5	µg/L	**9.3**	**2.2**	**2.2**	**1.8**	<0.5
Silver	7440-22-4	0.1	µg/L	**0.1**	**0.1**	**0.2**	<0.1	<0.1
Vanadium	7440-62-2	0.5	µg/L	**1.0**	**0.8**	**3.1**	**1.2**	**0.6**
Zinc	7440-66-6	5	µg/L	**27**	**10**	**6**	<5	**7**
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	**1.2**	<1.0	**1.0**	<1.0

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT07_SHALLOW	IT07_MID	IT07_DEEP	IT06_SHALLOW	IT06_MID
Client sampling date / time				19-APR-2011 15:00	19-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	20-APR-2011 15:00
				ES1108478-001	ES1108478-002	ES1108478-003	ES1108478-004	ES1108478-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	1.0	µg/L	3.2	2.3	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L	6.0	5.2	1.8	1.2	4.3
Anthracene	120-12-7	1.0	µg/L	3.8	3.0	<1.0	<1.0	1.5
Fluoranthene	206-44-0	1.0	µg/L	17.7	12.8	4.2	1.8	6.6
Pyrene	129-00-0	1.0	µg/L	21.7	19.7	4.6	2.5	7.8
Benz(a)anthracene	56-55-3	1.0	µg/L	10.9	6.8	2.0	<1.0	3.0
Chrysene	218-01-9	1.0	µg/L	8.9	6.2	1.8	<1.0	3.2
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	15.0	9.1	2.1	1.3	3.5
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	5.7	3.6	1.5	<1.0	1.6
Benzo(a)pyrene	50-32-8	0.5	µg/L	12.7	8.2	2.3	1.2	3.4
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	6.4	4.1	1.2	<1.0	1.6
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	1.7	1.2	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	8.9	4.7	1.4	<1.0	2.0
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	123	88.1	22.9	9.0	38.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	70	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	1410	900	230	690	470
C29 - C36 Fraction	----	50	µg/L	1060	440	230	250	290
^ C10 - C36 Fraction (sum)	----	50	µg/L	2470	1340	460	940	760
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	70	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	30	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	2060	1170	380	830	670
>C34 - C40 Fraction	----	100	µg/L	780	250	160	130	160
^ >C10 - C40 Fraction (sum)	----	100	µg/L	2840	1420	540	960	830
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L	39	<5	<5	9	<5
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	39	<1	<1	9	<1

Analytical Results

Sub-Matrix: WATER				Client sample ID	IT07_SHALLOW	IT07_MID	IT07_DEEP	IT06_SHALLOW	IT06_MID
				Client sampling date / time	19-APR-2011 15:00	19-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	20-APR-2011 15:00
Compound	CAS Number	LOR	Unit		ES1108478-001	ES1108478-002	ES1108478-003	ES1108478-004	ES1108478-005
EP080: BTEXN - Continued									
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**45.6**	**31.2**	**30.4**	**33.6**	**30.7**
2-Chlorophenol-D4	93951-73-6	0.1	%		**95.1**	**68.8**	**64.7**	**72.1**	**60.4**
2.4.6-Tribromophenol	118-79-6	0.1	%		**88.6**	**83.3**	**74.5**	**78.2**	**73.9**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**92.4**	**75.4**	**72.4**	**71.5**	**68.1**
Anthracene-d10	1719-06-8	0.1	%		**95.7**	**75.9**	**69.6**	**69.7**	**66.1**
4-Terphenyl-d14	1718-51-0	0.1	%		**91.2**	**74.0**	**65.8**	**66.5**	**62.9**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**90.0**	**91.9**	**84.6**	**88.5**	**90.1**
Toluene-D8	2037-26-5	0.1	%		**104**	**104**	**95.1**	**106**	**105**
4-Bromofluorobenzene	460-00-4	0.1	%		**93.2**	**94.0**	**87.1**	**92.9**	**92.4**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	IT06_DEEP	QC636	QC637	----	----
				Client sampling date / time	20-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	----	----
					ES1108478-006	ES1108478-007	ES1108478-008	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		**1590**	<5	<5	----	----
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	----	----
Selenium	7782-49-2	0.2	µg/L		**0.8**	<0.2	<0.2	----	----
Arsenic	7440-38-2	0.2	µg/L		**2.2**	<0.2	<0.2	----	----
Barium	7440-39-3	0.5	µg/L		**90.1**	<0.5	<0.5	----	----
Beryllium	7440-41-7	0.1	µg/L		**1.6**	<0.1	<0.1	----	----
Cadmium	7440-43-9	0.05	µg/L		**0.13**	<0.05	<0.05	----	----
Chromium	7440-47-3	0.2	µg/L		**0.3**	<0.2	<0.2	----	----
Cobalt	7440-48-4	0.1	µg/L		**17.5**	<0.1	<0.1	----	----
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	----	----
Lead	7439-92-1	0.1	µg/L		**6.4**	<0.1	<0.1	----	----
Manganese	7439-96-5	0.5	µg/L		**2050**	<0.5	<0.5	----	----
Nickel	7440-02-0	0.5	µg/L		**27.3**	<0.5	<0.5	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Vanadium	7440-62-2	0.2	µg/L		**1.5**	<0.2	<0.2	----	----
Zinc	7440-66-6	1	µg/L		**167**	**1**	**3**	----	----
EK025G: Free cyanide by Discrete Analyser									
Free Cyanide	----	0.004	mg/L		<0.004	----	----	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	----	0.004	mg/L		<0.004	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	<1.0	<1.0	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	<2.0	<2.0	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0	<1.0	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	<1.0	<1.0	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	<1.0	<1.0	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	<2.0	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT06_DEEP	QC636	QC637	----	----
				Client sampling date / time: 20-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	----	----
				ES1108478-006	ES1108478-007	ES1108478-008	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	**7**	<5	<5	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	**7**	<1	<1	----	----

Analytical Results

Sub-Matrix: WATER			Client sample ID	IT06_DEEP	QC636	QC637	----	----
			Client sampling date / time	20-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1108478-006	ES1108478-007	ES1108478-008	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**32.7**	**34.3**	**30.0**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**64.7**	**70.7**	**74.6**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**77.0**	**75.7**	**75.3**	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**72.3**	**74.9**	**73.3**	----	----
Anthracene-d10	1719-06-8	0.1	%	**72.0**	**73.0**	**73.2**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**66.7**	**70.3**	**69.4**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**91.2**	**89.1**	**90.6**	----	----
Toluene-D8	2037-26-5	0.1	%	**101**	**98.8**	**105**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**95.7**	**93.2**	**99.9**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	64.1
2-Chlorophenol-D4	93951-73-6	11.3	122.9
2.4.6-Tribromophenol	118-79-6	11.7	144.0
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	19.9	122.8
Anthracene-d10	1719-06-8	23.3	125.8
4-Terphenyl-d14	1718-51-0	20.3	134.5
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Rd Smithfield NSW
Contact Name:
Lab. Ref:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: Barangaroo VMP DGI **Project Number:** 60153531 - 6.1 **Purchase Order Number:** 39540AUS

Sample collected by: Dirk Sanderson **Sample Results to be returned to:** Anthony.Davis@aecom.com Kate.OBrien@aecom.com

Specifications: Cyanide cancelled on QC samples as bottle not provided. As per Kate 21/4/11.

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☐ Email	☐ Yes	☐ No	☐ N/A

7. Report Format: 8. Project Manager: Anthony Davis tel: 8484 8952

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Dissolved metals (Ultra Trace)*	TPH/BTEX	PAHs / Phenols	Free & WAD Cyanide
1	IT07_Shallow	19.4.11			X		*		X		4A, 4V, 2P	X	X	X	X
2	IT07_Mid	↓			X				X		↓	X	X	X	X
3	IT07_Deep	↓			X				X		↓	X	X	X	X
4	IT06_Shallow	20.4.11			X				X		4A, 4V, 3P	X	X	X	X
5	IT06_Mid	↓			X				X		↓	X	X	X	X
6	IT06_Deep	↓			X				X		↓	X	X	X	X
7	QC636	19.4.11			X				X		2A, 2V, 2P	X	X	X	X
8	QC637	20.4.11			X		↓		X		2A, 2V, 2P	X	X	X	X

Remarks & comments: metals (16) As; Ba; Be; Bo; Cr; Co; Cu; Mn; Hg; Ni; Pb; V; Zn; Al; Sb; Se; Ag

Kate will confirm metals

Environmental Division Sydney
Work Order
ES1108478
Telephone : +61-2-8784 8555

* Ultra Trace Metals Field Filtered

Relinquished By:	Received by:			
Name: Dirk Sanderson	Date: 20.4.11	Name: Sam	Date: 20/4/11	Received in good condition? Yes/No/NA
of: AECOM (Gordon)	Time: 12:30	of: ALS	Time: 3:35	Samples received chilled? Yes/No/NA
Relinquished By:		**Received by:**		Received in good condition? Yes/No/NA
Name:	Date:	Name:	Date:	Samples received chilled? Yes/No/NA
of:	Time:	of:	Time:	

Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

QUALITY CONTROL REPORT

Work Order	: **ES1108478**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: 60153531-6 1BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-APR-2011
Sampler	: DS	Issue Date	: 02-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 8
Quote number	: SY/418/10 V2	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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Spectroscopist	Sydney Inorganics
Phalak Inthaksone	Organics Co-ordinator	Sydney 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035F: Dissolved Mercury by FIMS (QC Lot: 1762652)									
ES1108478-001	IT07_SHALLOW	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1108478-007	QC636	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1764960)									
ES1108478-001	IT07_SHALLOW	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	0.4	0.4	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	14.1	13.9	1.2	0% - 20%
		EG093A-F: Lead	7439-92-1	0.2	µg/L	2.8	2.8	0.0	0% - 50%
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	2.6	2.3	10.8	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	1.6	1.8	12.4	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	41.9	43.5	3.8	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	9.3	8.6	7.4	0% - 50%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.0	1.2	19.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	68	64	6.3	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	4	4	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	10	<10	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	27	24	12.8	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1764961)									
ES1108478-001	IT07_SHALLOW	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1762586)									
ES1108478-006	IT06_DEEP	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	0.13	0.11	21.5	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	1.6	1.7	0.0	0% - 50%
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	17.5	16.8	4.3	0% - 20%
		EG094A-F: Lead	7439-92-1	0.1	µg/L	6.4	6.2	2.3	0% - 20%
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	2.2	2.0	8.6	0% - 50%
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	0.3	0.3	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	1.5	1.6	9.6	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	90.1	89.8	0.3	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	2050	2110	3.2	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	27.3	26.2	4.1	0% - 20%
		EG094A-F: Zinc	7440-66-6	1	µg/L	167	166	1.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1762586) - continued									
ES1108478-006	IT06_DEEP	EG094A-F: Aluminium	7429-90-5	5	µg/L	1590	1580	0.6	0% - 20%
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1762587)									
ES1108478-006	IT06_DEEP	EG094B-F: Selenium	7782-49-2	0.2	µg/L	0.8	0.8	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1759549)									
ES1108478-001	IT07_SHALLOW	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1759552)									
ES1108478-001	IT07_SHALLOW	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1767228)									
ES1108478-001	IT07_SHALLOW	EP080: C6 - C9 Fraction	----	20	µg/L	70	60	0.0	No Limit
ES1108487-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1767228)									
ES1108478-001	IT07_SHALLOW	EP080: C6 - C10 Fraction	----	20	µg/L	70	70	0.0	No Limit
ES1108487-003	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1767228)									
ES1108478-001	IT07_SHALLOW	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	39	39	0.0	0% - 50%
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1108487-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1762652)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	104	86	116
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1764960)								
EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	50 µg/L	98.4	80	128
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	102	85	125
EG093A-F: Barium	7440-39-3	1	µg/L	<1	10 µg/L	92.2	81	129
EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	106	80	122
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	86.8	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	105	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	99.3	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	93.2	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	94.2	87	123
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	98.7	90	122
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	87.0	84	124
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	89.8	70	130
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	97.8	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	92.6	82	128
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1764961)								
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	94.5	74	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1762586)								
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	86.7	78	132
EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	<0.2	10 µg/L	86.4	86	124
EG094A-F: Barium	7440-39-3	0.5	µg/L	<0.5	10 µg/L	75.9	71	125
EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	90.7	73	127
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	93.9	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	92.2	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	# 80.1	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	# 82.0	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	100 µg/L	101	82	120
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	102	82	126
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	# 81.3	86	122
EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	118	61	125
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	84.3	83	117

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1762586) - continued								
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	85.5	79	133
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1762587)								
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	87.0	75	123
EK025G: Free cyanide by Discrete Analyser (QCLot: 1759549)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	109	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1759552)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	100	70	129
EP075(SIM)A: Phenolic Compounds (QCLot: 1760396)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	----	2 µg/L	50.7	24.5	61.9
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	----	2 µg/L	80.2	63.8	110
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	----	2 µg/L	81.5	55.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	----	4 µg/L	69.8	42.5	114
		2	µg/L	<2.0	----	----	----	----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	----	2 µg/L	86.2	62.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	----	2 µg/L	82.2	59.9	112
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	----	2 µg/L	88.7	59.3	122
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	----	2 µg/L	91.8	64.3	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	----	2 µg/L	90.2	63	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	----	2 µg/L	85.4	58.7	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	----	2 µg/L	82.4	51.2	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	----	4 µg/L	52.9	6.85	95.6
		2	µg/L	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1760396)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	----	2 µg/L	97.4	58.6	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	----	2 µg/L	93.9	63.6	114
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	----	2 µg/L	94.3	62.2	113
		1	µg/L	<1.0	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 1760396) - continued								
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	----	2 µg/L	88.1	63.9	115
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	----	2 µg/L	89.1	62.6	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	----	2 µg/L	86.7	64.3	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	----	2 µg/L	91.0	63.6	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	2 µg/L	90.0	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	2 µg/L	88.8	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	2 µg/L	88.7	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	2 µg/L	88.1	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	2 µg/L	82.2	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	2 µg/L	93.4	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	2 µg/L	77.6	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	----	2 µg/L	82.2	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	----	2 µg/L	77.3	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1760395)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	127	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	128	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	120	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1767228)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	80.7	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1760395)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	116	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	113	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	129	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767228)								

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 Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767228) - continued								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	78.5	75	127
EP080: BTEXN (QCLot: 1767228)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	92.8	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	93.0	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	88.8	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	86.9	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	89.4	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	92.9	72.9	127

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1762652)							
ES1108478-002	IT07_MID	EG035F: Mercury	7439-97-6	0.0100 mg/L	81.3	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1764960)							
ES1108478-002	IT07_MID	EG093A-F: Arsenic	7440-38-2	50 µg/L	105	70	130
		EG093A-F: Barium	7440-39-3	50 µg/L	95.9	70	130
		EG093A-F: Beryllium	7440-41-7	50 µg/L	93.5	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	80.4	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	108	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	103	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	99.2	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	99.5	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	101	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	93.5	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	102	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	94.4	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1762586)							
ES1108478-006	IT06_DEEP	EG094A-F: Arsenic	7440-38-2	50 µg/L	125	70	130
		EG094A-F: Barium	7440-39-3	50 µg/L	99.1	70	130
		EG094A-F: Beryllium	7440-41-7	50 µg/L	85.6	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	90.6	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	93.8	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	112	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	106	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	97.0	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	# Not Determined	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	106	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	106	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	88.4	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1759549)							
ES1108478-001	IT07_SHALLOW	EK025G: Free Cyanide	----	0.2 mg/L	89.6	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1759552)							
ES1108478-001	IT07_SHALLOW	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	98.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1767228)							
ES1108478-001	IT07_SHALLOW	EP080: C6 - C9 Fraction	----	325 µg/L	94.3	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767228)							

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*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767228) - continued							
ES1108478-001	IT07_SHALLOW	EP080: C6 - C10 Fraction	----	375 µg/L	88.4	70	130
EP080: BTEXN (QCLot: 1767228)							
ES1108478-001	IT07_SHALLOW	EP080: Benzene	71-43-2	25 µg/L	93.4	70	130
		EP080: Toluene	108-88-3	25 µg/L	99.5	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	96.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	91.8	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	92.0	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	73.8	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1108478**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
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Project	: 60153531-6 1BARANGAROO VMP DGI	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 20-APR-2011
Sampler	: DS	Issue Date	: 02-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 8
Quote number	: SY/418/10 V2	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: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	---	17-MAY-2011	----	**29-APR-2011**	17-MAY-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	---	18-MAY-2011	----	**29-APR-2011**	18-MAY-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT07_SHALLOW, IT07_MID, IT07_DEEP	**19-APR-2011**	**28-APR-2011**	16-OCT-2011	✓	**28-APR-2011**	16-OCT-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT06_SHALLOW, IT06_MID	**20-APR-2011**	**28-APR-2011**	17-OCT-2011	✓	**28-APR-2011**	17-OCT-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered QC636	**19-APR-2011**	---	16-OCT-2011	----	**27-APR-2011**	16-OCT-2011	✓
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT06_DEEP, QC637	**20-APR-2011**	---	17-OCT-2011	----	**27-APR-2011**	17-OCT-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH IT07_SHALLOW, IT07_MID, IT07_DEEP	**19-APR-2011**	**28-APR-2011**	03-MAY-2011	✓	**28-APR-2011**	03-MAY-2011	✓
White Plastic Bottle-NaOH IT06_SHALLOW, IT06_MID, IT06_DEEP	**20-APR-2011**	**28-APR-2011**	04-MAY-2011	✓	**28-APR-2011**	04-MAY-2011	✓
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH IT07_SHALLOW, IT07_MID, IT07_DEEP	**19-APR-2011**	**28-APR-2011**	03-MAY-2011	✓	**28-APR-2011**	03-MAY-2011	✓
White Plastic Bottle-NaOH IT06_SHALLOW, IT06_MID, IT06_DEEP	**20-APR-2011**	**28-APR-2011**	04-MAY-2011	✓	**28-APR-2011**	04-MAY-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
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**21-APR-2011**	26-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber Glass Bottle - Unpreserved IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**21-APR-2011**	27-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**21-APR-2011**	26-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber Glass Bottle - Unpreserved IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**21-APR-2011**	27-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**21-APR-2011**	26-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber Glass Bottle - Unpreserved IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**21-APR-2011**	27-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber VOC Vial - HCl IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**01-MAY-2011**	03-MAY-2011	✓	**01-MAY-2011**	03-MAY-2011	✓
Amber VOC Vial - HCl IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**01-MAY-2011**	04-MAY-2011	✓	**01-MAY-2011**	04-MAY-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**21-APR-2011**	26-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber Glass Bottle - Unpreserved IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**21-APR-2011**	27-APR-2011	✓	**28-APR-2011**	07-JUN-2011	✓
Amber VOC Vial - HCl IT07_SHALLOW, IT07_MID, IT07_DEEP, QC636	**19-APR-2011**	**01-MAY-2011**	03-MAY-2011	✓	**01-MAY-2011**	03-MAY-2011	✓
Amber VOC Vial - HCl IT06_SHALLOW, IT06_MID, IT06_DEEP, QC637	**20-APR-2011**	**01-MAY-2011**	04-MAY-2011	✓	**01-MAY-2011**	04-MAY-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: BTEXN								
Amber VOC Vial - HCl								
IT07_SHALLOW,	IT07_MID,	**19-APR-2011**	**01-MAY-2011**	03-MAY-2011	✓	**01-MAY-2011**	03-MAY-2011	✓
IT07_DEEP,	QC636							
Amber VOC Vial - HCl								
IT06_SHALLOW,	IT06_MID,	**20-APR-2011**	**01-MAY-2011**	04-MAY-2011	✓	**01-MAY-2011**	04-MAY-2011	✓
IT06_DEEP,	QC637							

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	3	**33.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	5	**20.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	6	**16.7**	**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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	6	**16.7**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	3	**33.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	5	**20.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	20	**5.0**	**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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	6	**16.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	3	**33.3**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	5	**20.0**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	6	**16.7**	**5.0**	✓	ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
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)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. 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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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 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: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2074207-003	----	**Cobalt**	7440-48-4	80.1 %	88-122%	**Recovery less than lower control limit**
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2074207-003	----	**Copper**	7440-50-8	82.0 %	88-122%	**Recovery less than lower control limit**
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2074207-003	----	**Nickel**	7440-02-0	81.3 %	86-122%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	ES1108478-006	IT06_DEEP	**Manganese**	7439-96-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1108663**	Page	: 1 of 11
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo ORWN HHERA	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: 39540AUS		
C-O-C number	: ----	Date Samples Received	: 21-APR-2011
Sampler	: DS	Issue Date	: 11-MAY-2011
Site	: ----		
		No. of samples received	: 27
Quote number	: EN/004/10	No. of samples analysed	: 27

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney 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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EK055G LOR raised for NH3 on the sample ID (IT06_Mid) due to sample matrix.**
- **EP132: Particular samples (filter paper) required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly. Poor surrogate reocvery due to sample matrix interferences.**
- **Filtrate samples were produced using a filtering procedure requested by AECOM. Where requested a 500mL amber glass unpreserved bottle was filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter'. This filter paper was then analysed and is labeled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper. The second filter paper was then analysed and is labeled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample. Before filtering any samples, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT07_Shallow FP1	IT07_Shallow FP2	IT07_Mid FP1	IT07_Mid FP2	IT07_Deep FP1
				Client sampling date / time: [27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]
				ES1108663-007	ES1108663-008	ES1108663-009	ES1108663-010	ES1108663-011
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	<20	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	<20	<20	<20	<20	<20
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthene	83-32-9	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthylene	208-96-8	10	µg/filter	**30**	<20	<20	<20	<20
Anthracene	120-12-7	10	µg/filter	**50**	<20	**40**	<20	<20
Benz(a)anthracene	56-55-3	10	µg/filter	**250**	<20	**120**	<20	**60**
Benzo(a)pyrene	50-32-8	10	µg/filter	**430**	<20	**180**	<20	**80**
Benzo(b)fluoranthene	205-99-2	10	µg/filter	**310**	<20	**120**	<20	**60**
Benzo(e)pyrene	192-97-2	10	µg/filter	**260**	<20	**120**	<20	**60**
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	**200**	<20	**60**	<20	**30**
Benzo(k)fluoranthene	207-08-9	10	µg/filter	**290**	<20	**140**	<20	**60**
Chrysene	218-01-9	10	µg/filter	**260**	<20	**120**	<20	**60**
Coronene	191-07-1	10	µg/filter	**40**	<20	<20	<20	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	**60**	<20	<20	<20	<20
Fluoranthene	206-44-0	10	µg/filter	**440**	<20	**230**	<20	**110**
Fluorene	86-73-7	10	µg/filter	<20	<20	<20	<20	<20
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	**170**	<20	**60**	<20	**20**
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	<200
Naphthalene	91-20-3	10	µg/filter	<20	<20	<20	<20	<20
Perylene	198-55-0	10	µg/filter	**120**	<20	<20	<20	**20**
Phenanthrene	85-01-8	10	µg/filter	**160**	<20	**100**	<20	**50**
Pyrene	129-00-0	10	µg/filter	**530**	<20	**350**	<20	**120**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT07_Deep FP2	IT06_Shallow FP1	IT06_Shallow FP2	IT06_Mid FP1	IT06_Mid FP2
				Client sampling date / time: [27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]
				ES1108663-012	ES1108663-013	ES1108663-014	ES1108663-015	ES1108663-016
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	<20	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	<20	<20	<20	<20	<20
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthene	83-32-9	10	µg/filter	<20	<20	<20	<20	<20
Acenaphthylene	208-96-8	10	µg/filter	<20	<20	<20	<20	<20
Anthracene	120-12-7	10	µg/filter	<20	<20	<20	<20	<20
Benz(a)anthracene	56-55-3	10	µg/filter	<20	<20	<20	**30**	<20
Benzo(a)pyrene	50-32-8	10	µg/filter	<20	<20	<20	<20	<20
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(e)pyrene	192-97-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<20	<20	<20	<20	<20
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<20	<20	<20	<20	<20
Chrysene	218-01-9	10	µg/filter	<20	<20	<20	**40**	<20
Coronene	191-07-1	10	µg/filter	<20	<20	<20	<20	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	<20	<20	<20	<20
Fluoranthene	206-44-0	10	µg/filter	<20	<20	<20	**40**	<20
Fluorene	86-73-7	10	µg/filter	<20	<20	<20	<20	<20
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<20	<20	<20	<20	<20
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	<200
Naphthalene	91-20-3	10	µg/filter	<20	<20	<20	<20	<20
Perylene	198-55-0	10	µg/filter	<20	<20	<20	<20	<20
Phenanthrene	85-01-8	10	µg/filter	<20	<20	<20	**30**	<20
Pyrene	129-00-0	10	µg/filter	<20	<20	<20	**50**	<20
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT06_Deep FP1	IT06_Deep FP2	FP1 Blank	FP2 Blank	----
				Client sampling date / time: [27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]	----
				ES1108663-017	ES1108663-018	ES1108663-026	ES1108663-027	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<20	<20	<20	<20	----
2-Methylnaphthalene	91-57-6	10	µg/filter	<20	<20	<20	<20	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<20	<20	<20	<20	----
Acenaphthene	83-32-9	10	µg/filter	<20	<20	<20	<20	----
Acenaphthylene	208-96-8	10	µg/filter	<20	<20	<20	<20	----
Anthracene	120-12-7	10	µg/filter	<20	<20	<20	<20	----
Benz(a)anthracene	56-55-3	10	µg/filter	<20	<20	<20	<20	----
Benzo(a)pyrene	50-32-8	10	µg/filter	<20	<20	<20	<20	----
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<20	<20	<20	<20	----
Benzo(e)pyrene	192-97-2	10	µg/filter	<20	<20	<20	<20	----
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<20	<20	<20	<20	----
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<20	<20	<20	<20	----
Chrysene	218-01-9	10	µg/filter	<20	<20	<20	<20	----
Coronene	191-07-1	10	µg/filter	<20	<20	<20	<20	----
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<20	<20	<20	<20	----
Fluoranthene	206-44-0	10	µg/filter	<20	<20	<20	<20	----
Fluorene	86-73-7	10	µg/filter	<20	<20	<20	<20	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<20	<20	<20	<20	----
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<200	<200	<200	<200	----
Naphthalene	91-20-3	10	µg/filter	<20	<20	<20	<20	----
Perylene	198-55-0	10	µg/filter	<20	<20	<20	<20	----
Phenanthrene	85-01-8	10	µg/filter	<20	<20	<20	<20	----
Pyrene	129-00-0	10	µg/filter	<20	<20	<20	<20	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT07_Shallow	IT07_Mid	IT07_Deep	IT06_Shallow	IT06_Mid
				Client sampling date / time: 19-APR-2011 15:00	19-APR-2011 15:00	20-APR-2011 15:00	20-APR-2011 15:00	20-APR-2011 15:00
				ES1108663-001	ES1108663-002	ES1108663-003	ES1108663-004	ES1108663-005
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	----	**2.34**	<0.10
EP132A: Phenolic Compounds								
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	<0.1	**0.1**	<0.1
o-Cresol	95-48-7	0.1	µg/L	**0.6**	<0.1	<0.1	**0.2**	<0.1
p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	<0.1	**0.2**	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons								
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**80.7**	**65.7**	**81.6**	**61.7**	**50.5**
Phenol-d6	13127-88-3	0.1	%	**61.2**	**49.8**	**62.8**	**40.5**	**31.7**
2-Chlorophenol-D4	93951-73-6	0.1	%	**91.0**	**121**	**123**	**124**	**107**
2.4.6-Tribromophenol	118-79-6	0.1	%	**120**	**94.6**	**109**	**90.8**	**114**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**104**	**127**	**87.6**	**114**	**115**
Anthracene-d10	1719-06-8	0.1	%	**120**	**89.4**	**99.9**	**99.9**	**106**
4-Terphenyl-d14	1718-51-0	0.1	%	**128**	**91.9**	**103**	**101**	**111**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	IT06_Deep	IT07_Shallow Filtrate	IT07_Mid Filtrate	IT07_Deep Filtrate	IT06_Shallow Filtrate
				Client sampling date / time	20-APR-2011 15:00	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]
					ES1108663-006	ES1108663-019	ES1108663-020	ES1108663-021	ES1108663-022
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	----	0.004	mg/L		----	<0.004	<0.004	<0.004	<0.004
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**1.42**	----	----	----	**2.84**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	<20	**20**	**20**	<20
C10 - C14 Fraction	----	50	µg/L		----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		----	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		----	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		----	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		----	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L		----	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L		----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L		----	<100	<100	<100	<100
EP132A: Phenolic Compounds									
2-Chlorophenol	95-57-8	0.05	µg/L		----	<0.05	<0.05	<0.05	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L		----	<0.05	<0.05	**0.05**	<0.05
m-Cresol	108-39-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
o-Cresol	95-48-7	0.1	µg/L		<0.1	**0.8**	<0.1	**0.2**	<0.1
p-Cresol	106-44-5	0.1	µg/L		<0.1	<0.1	**0.1**	**0.2**	<0.1
2.4-Dichlorophenol	120-83-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2.4-Dimethylphenol	105-67-9	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Hexachlorophene	70-30-4	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L		----	<0.05	<0.05	<0.05	<0.05
Phenol	108-95-2	0.1	µg/L		----	**1.0**	**0.6**	**1.6**	**0.6**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons									
3-Methylcholanthrene	56-49-5	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L		<0.1	<0.1	<0.1	**3.1**	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT06_Deep	IT07_Shallow Filtrate	IT07_Mid Filtrate	IT07_Deep Filtrate	IT06_Shallow FIltrate
Client sampling date / time				20-APR-2011 15:00	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]	[27-APR-2011]
				ES1108663-006	ES1108663-019	ES1108663-020	ES1108663-021	ES1108663-022
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.1	µg/L	----	<0.1	<0.1	**0.4**	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	----	<0.1	<0.1	**1.8**	<0.1
Anthracene	120-12-7	0.1	µg/L	----	<0.1	<0.1	**1.1**	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	----	<0.1	<0.1	**1.0**	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	----	<0.05	<0.05	**0.63**	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	----	<0.1	<0.1	**0.4**	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	----	<0.1	<0.1	**0.3**	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	----	<0.1	<0.1	**0.1**	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	----	<0.1	<0.1	**0.4**	<0.1
Chrysene	218-01-9	0.1	µg/L	----	<0.1	<0.1	**0.9**	<0.1
Coronene	191-07-1	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	----	<0.1	<0.1	**0.1**	<0.1
Fluoranthene	206-44-0	0.1	µg/L	----	<0.1	<0.1	**1.6**	<0.1
Fluorene	86-73-7	0.1	µg/L	----	<0.1	<0.1	**1.7**	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	----	<0.1	<0.1	**0.2**	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	----	**0.2**	**0.2**	**4.0**	<0.1
Perylene	198-55-0	0.1	µg/L	----	<0.1	<0.1	**0.2**	<0.1
Phenanthrene	85-01-8	0.1	µg/L	----	<0.1	<0.1	**4.3**	<0.1
Pyrene	129-00-0	0.1	µg/L	----	<0.1	<0.1	**2.1**	<0.1
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	----	**102**	**100**	**104**	**104**
Toluene-D8	2037-26-5	0.1	%	----	**84.2**	**82.4**	**86.1**	**90.3**
4-Bromofluorobenzene	460-00-4	0.1	%	----	**81.9**	**83.4**	**84.0**	**84.2**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**59.0**	**81.4**	**37.8**	**108**	**49.0**
Phenol-d6	13127-88-3	0.1	%	**36.4**	**71.2**	**32.3**	**93.5**	**44.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**92.3**	**113**	**117**	**133**	**118**
2.4.6-Tribromophenol	118-79-6	0.1	%	**104**	**92.8**	**106**	**130**	**107**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**97.0**	**87.4**	**115**	**131**	**101**
Anthracene-d10	1719-06-8	0.1	%	**103**	**95.2**	**100**	**125**	**92.9**
4-Terphenyl-d14	1718-51-0	0.1	%	**104**	**96.0**	**108**	**128**	**96.4**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT06_Mid Filtrate	IT06_Deep Filtrate	Filtrate Blank	----	----
				Client sampling date / time: [27-APR-2011]	[27-APR-2011]	[27-APR-2011]	----	----
				ES1108663-023	ES1108663-024	ES1108663-025	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.46**	**1.78**	**0.06**	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
o-Cresol	95-48-7	0.1	µg/L	**0.1**	**0.2**	<0.1	----	----
p-Cresol	106-44-5	0.1	µg/L	**0.1**	**0.2**	<0.1	----	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.05	<0.05	----	----
Phenol	108-95-2	0.1	µg/L	**1.0**	**1.8**	**0.3**	----	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	<0.1	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT06_Mid Filtrate	IT06_Deep Filtrate	Filtrate Blank	----	----
				Client sampling date / time: [27-APR-2011]	[27-APR-2011]	[27-APR-2011]	----	----
				ES1108663-023	ES1108663-024	ES1108663-025	----	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Naphthalene	91-20-3	0.1	µg/L	**0.3**	**0.3**	**0.2**	----	----
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**96.9**	**116**	**118**	----	----
Toluene-D8	2037-26-5	0.1	%	**83.9**	**103**	**100**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**79.7**	**97.4**	**99.3**	----	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**101**	**107**	**58.8**	----	----
Phenol-d6	13127-88-3	0.1	%	**89.7**	**94.2**	**45.7**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**114**	**126**	**98.2**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**98.4**	**105**	**59.6**	----	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**99.5**	**94.0**	**118**	----	----
Anthracene-d10	1719-06-8	0.1	%	**98.2**	**104**	**106**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**101**	**105**	**109**	----	----

Surrogate Control Limits

Sub-Matrix: **FILTER PAPER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

11/5/11

Jennifer Cullen

FAS 27/4/11 3pm

From: McGrath, Kate [Kate.O'Brien@aecom.com]
Sent: Thursday, 21 April 2011 2:01 PM
To: Glenyss Weeks
Cc: Davis, Anthony; Smith, Garry (Sydney); Jennifer Cullen
Subject: ES1108478 - Additional Analysis Request

Hi Glenyss

Could I please get the following additional analysis done for samples from ES1108478. Please create separate work order for this additional analysis and reference project Barangaroo ORWN HHERA on the report.

- Samples IT07_Shallow (1), IT07_Mid (2) and IT07_Deep (3)

1-3
- Cresols (standard ultra trace analysis)
- 2 methylnapthalene (standard ultra trace analysis)

19-21
- PAHs - Filtrate and Filter cake Analysis — 7-12
- Phenols - Cresols Filtrate
- TPH - Filtrate
- 2 methylnapthalene - Filtrate
- WAD Cyanide - Filtrate

FP Samples = (7) to (18) (PAH)

Filtrate Samples = (19) to (24)

Blank Samples = (25) to (27)

- Samples IT06_Shallow (4), IT06_Mid (5) and IT06_Deep (6)

4-6
- Cresols (standard ultra trace analysis)
- 2 methylnapthalene (standard ultra trace analysis)
- Ammonia (standard ~~ultra trace~~ analysis) — purple bottle only so use EK055G.

22-24
- PAHs - Filtrate and Filter cake Analysis — 13-18
- Phenols and cresols - Filtrate
- TPH - Filtrate
- 2 methylnapthalene - Filtrate
- WAD Cyanide - Filtrate
- Ammonia - Filtrate

Environmental Division Sydney
Work Order
ES1108663
Telephone : +61-2-8784 8555

Filtrate = analysed (ultra trace) after twice laboratory filtered (As per methodology in ES1104220)
Filter cake = analysis of residue on the filter paper (As per methodology in ES1104220)

Regards,

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

ES1108663.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1108663**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo ORWN HHERA	Page	: 1 of 3
Order number	: 39540AUS		
C-O-C number	: ----	Quote number	: ES2010HLAENV0384 (EN/004/10)
Site	: ----		
Sampler	: DS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 21-APR-2011	Issue Date	: 27-APR-2011 18:47
Client Requested Due Date	: 11-MAY-2011	Scheduled Reporting Date	: **11-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.4'C - Ice present
No. of coolers/boxes	: 3 HARD	No. of samples received	: 27
Security Seal	: Intact.	No. of samples analysed	: 27

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.**
- **Breaches in recommended extraction / analysis holding times may occur. Please contact ALS for further information.**
- **Volatile TPH C6-C9 analysis on Filtrate samples will be compromised after the filtering process however results are to be reported as per Gary Smith 27/4/11.**
- **500mL amber bottles to be lab filtered twice before analysis. The first and second filter paper for each sample is to be analysed as seperate samples.**
- **Holding times on water for Semi-volatile analysis is 7 days from sampling.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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
EP132 : Semivolatile Compounds by GCMS(SIM - Ultra-trace)		
IT07_Shallow FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT07_Shallow FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT07_Mid FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT07_Mid FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT07_Deep FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT07_Deep FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Shallow FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Shallow FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Mid FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Mid FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Deep FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT06_Deep FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
FP1 Blank	- Personal Filter	- Soil Glass Jar - Unpreserved
FP2 Blank	- Personal Filter	- Soil Glass Jar - Unpreserved

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 - EP132B Ultratrace PAH's
ES1108663-007	[27-APR-2011]	IT07_Shallow FP1	✓
ES1108663-008	[27-APR-2011]	IT07_Shallow FP2	✓
ES1108663-009	[27-APR-2011]	IT07_Mid FP1	✓
ES1108663-010	[27-APR-2011]	IT07_Mid FP2	✓
ES1108663-011	[27-APR-2011]	IT07_Deep FP1	✓
ES1108663-012	[27-APR-2011]	IT07_Deep FP2	✓
ES1108663-013	[27-APR-2011]	IT06_Shallow FP1	✓
ES1108663-014	[27-APR-2011]	IT06_Shallow FP2	✓
ES1108663-015	[27-APR-2011]	IT06_Mid FP1	✓
ES1108663-016	[27-APR-2011]	IT06_Mid FP2	✓
ES1108663-017	[27-APR-2011]	IT06_Deep FP1	✓
ES1108663-018	[27-APR-2011]	IT06_Deep FP2	✓
ES1108663-026	[27-APR-2011]	FP1 Blank	✓
ES1108663-027	[27-APR-2011]	FP2 Blank	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EP071(SV-TPH-WD) Total Petroleum Hydrocarbons (TPH)	WATER - EP071(V - TPH-WD) TPH Volatiles	WATER - EP132AB Ultra Trace PAH/Phenolic Compounds
ES1108663-001	19-APR-2011 15:00	IT07_Shallow					✓
ES1108663-002	19-APR-2011 15:00	IT07_Mid					✓
ES1108663-003	20-APR-2011 15:00	IT07_Deep					✓
ES1108663-004	20-APR-2011 15:00	IT06_Shallow		✓			✓
ES1108663-005	20-APR-2011 15:00	IT06_Mid		✓			✓
ES1108663-006	20-APR-2011 15:00	IT06_Deep		✓			✓
ES1108663-019	[27-APR-2011]	IT07_Shallow Filtra...	✓		✓	✓	✓
ES1108663-020	[27-APR-2011]	IT07_Mid Filtrate	✓		✓	✓	✓
ES1108663-021	[27-APR-2011]	IT07_Deep Filtrate	✓		✓	✓	✓
ES1108663-022	[27-APR-2011]	IT06_Shallow FIltra...	✓	✓	✓	✓	✓
ES1108663-023	[27-APR-2011]	IT06_Mid Filtrate	✓	✓	✓	✓	✓
ES1108663-024	[27-APR-2011]	IT06_Deep Filtrate	✓	✓	✓	✓	✓
ES1108663-025	[27-APR-2011]	Filtrate Blank	✓	✓	✓	✓	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS KATE O BRIEN

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- A4 - AU Tax Invoice (INV)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

QUALITY CONTROL REPORT

Work Order	: **ES1108663**	Page	: 1 of 7
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo ORWN HHERA	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-APR-2011
Sampler	: DS	Issue Date	: 11-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 27
Quote number	: EN/004/10	No. of samples analysed	: 27

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1767222)									
ES1108663-019	IT07_Shallow Filtrate	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1765770)									
ES1108637-004	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.36	0.40	10.3	0% - 20%
ES1108724-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	36.8	36.6	0.5	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1767185)									
ES1108585-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.10	0.0	0% - 50%
ES1108661-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	188	193	2.6	0% - 20%
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1767254)									
ES1108508-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	40	40	0.0	No Limit
ES1108508-011	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1767254)									
ES1108508-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	40	40	0.0	No Limit
ES1108508-011	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit

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

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

Sub-Matrix: **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
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1764348)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	65.7	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	100	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	# 160	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	106	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	95.6	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	91.2	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	104	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	93.0	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	96.2	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	82.8	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	113	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	100	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	113	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	115	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	114	61.7	129
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	106	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	103	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	114	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	1000 µg/kg	81.4	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	106	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	105	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	108	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	109	67.9	127

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
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1767222)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	101	70	129
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1765770)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	104	79.6	122
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1767185)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	91.8	79.6	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1766940)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	70.6	58.9	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: 1766940) - continued								
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	99.3	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	75.7	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1767254)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	91.8	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1766940)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	71.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	84.9	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	107	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767254)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	90.7	75	127
EP132A: Phenolic Compounds (QCLot: 1766944)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	114	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	95.7	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	73.4	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	73.2	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	64.4	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	106	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	107	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	104	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	88.2	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	# 120	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	91.3	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	71.6	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	49.9	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	74.9	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	90.3	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	95.8	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1766944)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	95.0	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	81.9	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	64.2	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	84.3	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	83.0	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	82.5	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	85.2	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	89.2	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	96.6	71.4	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1766944) - continued								
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	87.4	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	82.6	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	77.2	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	83.0	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	75.9	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	83.6	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	86.9	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	87.2	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	83.0	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	63.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	72.3	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	76.8	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	79.3	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	86.6	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1767222)							
ES1108663-019	IT07_Shallow Filtrate	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	97.0	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1765770)							
ES1108637-004	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	96.2	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1767185)							
ES1108585-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	92.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1767254)							
ES1108508-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	101	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1767254)							
ES1108508-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	98.8	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1108663**	Page	: 1 of 9
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE O BRIEN	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
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Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo ORWN HHERA	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: ----	Date Samples Received	: 21-APR-2011
Sampler	: DS	Issue Date	: 11-MAY-2011
Order number	: 39540AUS		
		No. of samples received	: 27
Quote number	: EN/004/10	No. of samples analysed	: 27

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Personal Filter IT07_Shallow - FP1, IT07_Shallow - FP2, IT07_Mid - FP1, IT07_Mid - FP2, IT07_Deep - FP1, IT07_Deep - FP2, IT06_Shallow - FP1, IT06_Shallow - FP2, IT06_Mid - FP1, IT06_Mid - FP2, IT06_Deep - FP1, IT06_Deep - FP2, FP1 Blank, FP2 Blank	**27-APR-2011**	**29-APR-2011**	11-MAY-2011	✓	**02-MAY-2011**	08-JUN-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
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH IT07_Shallow - Filtrate, IT07_Mid - Filtrate, IT07_Deep - Filtrate, IT06_Shallow - FIltrate, IT06_Mid - Filtrate, IT06_Deep - Filtrate, Filtrate Blank	**27-APR-2011**	**29-APR-2011**	11-MAY-2011	✓	**29-APR-2011**	11-MAY-2011	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid IT06_Shallow, IT06_Mid, IT06_Deep	**20-APR-2011**	**---**	18-MAY-2011	----	**28-APR-2011**	18-MAY-2011	✓
Clear Plastic Bottle - Sulfuric Acid IT06_Shallow - FIltrate, IT06_Mid - Filtrate, IT06_Deep - Filtrate, Filtrate Blank	**27-APR-2011**	**---**	25-MAY-2011	----	**29-APR-2011**	25-MAY-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								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**29-APR-2011**	04-MAY-2011	✓	**29-APR-2011**	08-JUN-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								
Amber VOC Vial - HCl								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**02-MAY-2011**	11-MAY-2011	✓	**02-MAY-2011**	11-MAY-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
Amber Glass Bottle - Unpreserved								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**29-APR-2011**	04-MAY-2011	✓	**29-APR-2011**	08-JUN-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								
Amber VOC Vial - HCl								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**02-MAY-2011**	11-MAY-2011	✓	**02-MAY-2011**	11-MAY-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								
EP132A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved								
IT07_Shallow,	IT07_Mid	**19-APR-2011**	**29-APR-2011**	26-APR-2011	×	**30-APR-2011**	08-JUN-2011	✓
Amber Glass Bottle - Unpreserved								
IT07_Deep,	IT06_Shallow,	**20-APR-2011**	**29-APR-2011**	27-APR-2011	×	**30-APR-2011**	08-JUN-2011	✓
IT06_Mid,	IT06_Deep							
Amber Glass Bottle - Unpreserved								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**29-APR-2011**	04-MAY-2011	✓	**30-APR-2011**	08-JUN-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								
EP132B: Polynuclear Aromatic Hydrocarbons								
Amber Glass Bottle - Unpreserved								
IT07_Shallow,	IT07_Mid	**19-APR-2011**	**29-APR-2011**	26-APR-2011	×	**30-APR-2011**	08-JUN-2011	✓
Amber Glass Bottle - Unpreserved								
IT07_Deep,	IT06_Shallow,	**20-APR-2011**	**29-APR-2011**	27-APR-2011	×	**30-APR-2011**	08-JUN-2011	✓
IT06_Mid,	IT06_Deep							
Amber Glass Bottle - Unpreserved								
IT07_Shallow - Filtrate,	IT07_Mid - Filtrate,	**27-APR-2011**	**29-APR-2011**	04-MAY-2011	✓	**30-APR-2011**	08-JUN-2011	✓
IT07_Deep - Filtrate,	IT06_Shallow - FIltrate,							
IT06_Mid - Filtrate,	IT06_Deep - Filtrate,							
Filtrate Blank								

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 Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	14	7.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	14	7.1	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	4	35	11.4	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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	8	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	2	35	5.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	7.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	14.3	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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	8	12.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	2	35	5.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	13	7.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	14.3	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
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	8	12.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	2	35	5.7	5.0	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	8	12.5	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
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH 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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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							
EP132B: Polynuclear Aromatic Hydrocarbons	2076428-002	----	**7.12-Dimethylbenz(a)anthracene**	57-97-6	160 %	6.88-147%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP132A: Phenolic Compounds	2079291-002	----	**2-Nitrophenol**	88-75-5	120 %	49.7-112%	**Recovery greater than upper control limit**

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

Regular Sample Surrogates

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132T: Base/Neutral Extractable Surrogates	ES1108663-007	IT07_Shallow FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-009	IT07_Mid FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-011	IT07_Deep FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-013	IT06_Shallow FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-015	IT06_Mid FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-017	IT06_Deep FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-008	IT07_Shallow FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-010	IT07_Mid FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-012	IT07_Deep FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-014	IT06_Shallow FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1108663-016	IT06_Mid FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-018	IT06_Deep FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-026	FP1 Blank	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-027	FP2 Blank	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-007	IT07_Shallow FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-009	IT07_Mid FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-011	IT07_Deep FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-013	IT06_Shallow FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-015	IT06_Mid FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-017	IT06_Deep FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-008	IT07_Shallow FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-010	IT07_Mid FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-012	IT07_Deep FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-014	IT06_Shallow FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-016	IT06_Mid FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-018	IT06_Deep FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-026	FP1 Blank	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-027	FP2 Blank	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-007	IT07_Shallow FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-009	IT07_Mid FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-011	IT07_Deep FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-013	IT06_Shallow FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1108663-015	IT06_Mid FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-017	IT06_Deep FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-008	IT07_Shallow FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-010	IT07_Mid FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-012	IT07_Deep FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-014	IT06_Shallow FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-016	IT06_Mid FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-018	IT06_Deep FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-026	FP1 Blank	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-027	FP2 Blank	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP132S: Acid Extractable Surrogates	ES1108663-021	IT07_Deep Filtrate	**2-Fluorophenol**	367-12-4	108 %	21-100 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1108663-023	IT06_Mid Filtrate	**2-Fluorophenol**	367-12-4	101 %	21-100 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1108663-024	IT06_Deep Filtrate	**2-Fluorophenol**	367-12-4	107 %	21-100 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1108663-024	IT06_Deep Filtrate	**Phenol-d6**	13127-88-3	94.2 %	10-94 %	**Recovery greater than upper data quality objective**
EP132S: Acid Extractable Surrogates	ES1108663-021	IT07_Deep Filtrate	**2.4.6-Tribromophenol**	118-79-6	130 %	10-123 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-021	IT07_Deep Filtrate	**2-Fluorobiphenyl**	321-60-8	131 %	43-116 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-002	IT07_Mid	**2-Fluorobiphenyl**	321-60-8	127 %	43-116 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1108663-025	Filtrate Blank	**2-Fluorobiphenyl**	321-60-8	118 %	43-116 %	**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.

Matrix: **WATER**

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
IT07_Shallow,	IT07_Mid	29-APR-2011	26-APR-2011	**3**	----	----	----
Amber Glass Bottle - Unpreserved							
IT07_Deep,	IT06_Shallow,	29-APR-2011	27-APR-2011	**2**	----	----	----
IT06_Mid,	IT06_Deep						
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
IT07_Shallow,	IT07_Mid	29-APR-2011	26-APR-2011	**3**	----	----	----
Amber Glass Bottle - Unpreserved							
IT07_Deep,	IT06_Shallow,	29-APR-2011	27-APR-2011	**2**	----	----	----
IT06_Mid,	IT06_Deep						

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.**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1110580**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Site	: Barangaroo		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EG094: LCS recovery for V falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG094: Zn results for sample ES1110580-9 confirmed by reanalysis.**
- **EK028G: LOR raised for WAD Cyanide on sample ID (IT04D) due to sample matrix.**
- **EK028G: Spike failed for WAD Cyanide due to matrix interference.**
- **EP080:Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP080:Results of IT04D have been confirmed by re-analysis.**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S	IT04M	IT04D	IT05S	IT05M
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
				ES1110580-001	ES1110580-002	ES1110580-003	ES1110580-004	ES1110580-005
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	<10	<10	<10	**10**	**10**
Selenium	7782-49-2	2	µg/L	<2	<2	<2	<2	<2
Antimony	7440-36-0	0.5	µg/L	**1.2**	<0.5	<0.5	**1.0**	<0.5
Arsenic	7440-38-2	0.5	µg/L	**0.6**	**1.5**	<0.5	**1.4**	**1.7**
Barium	7440-39-3	1	µg/L	**63**	**111**	**114**	**64**	**9**
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	**0.3**	**0.3**	<0.2
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L	**0.7**	**0.7**	**45.5**	**0.5**	<0.2
Copper	7440-50-8	1	µg/L	**30**	<1	**24**	<1	**2**
Lead	7439-92-1	0.2	µg/L	**0.8**	<0.2	<0.2	**0.5**	**0.6**
Manganese	7439-96-5	0.5	µg/L	**33.8**	**182**	**4520**	**12.6**	**2.2**
Nickel	7440-02-0	0.5	µg/L	**9.1**	**1.0**	**34.3**	**1.3**	<0.5
Silver	7440-22-4	0.1	µg/L	**0.3**	**0.1**	<0.1	<0.1	**0.2**
Vanadium	7440-62-2	0.5	µg/L	**1.2**	**0.8**	<0.5	**1.3**	**1.6**
Zinc	7440-66-6	5	µg/L	**18**	<5	**90**	**36**	**14**
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	<0.004
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	**0.006**	<0.008	<0.004	<0.004
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	**7**	<1	<1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S Client sampling date / time: 19-MAY-2011 15:00 ES1110580-001	IT04M 19-MAY-2011 15:00 ES1110580-002	IT04D 19-MAY-2011 15:00 ES1110580-003	IT05S 19-MAY-2011 15:00 ES1110580-004	IT05M 19-MAY-2011 15:00 ES1110580-005
EP080: BTEXN - Continued								
Toluene	108-88-3	2	µg/L	<5	<5	<5	<5	<5
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	<1	<1	**7**	<1	<1
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	**1.5**	<0.1	<0.1
o-Cresol	95-48-7	0.1	µg/L	<0.1	<0.1	**5.4**	<0.1	<0.1
p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	**0.3**	<0.1	<0.1
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.1	<0.1	**18.8**	<0.1	<0.1
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Phenol	108-95-2	0.1	µg/L	<0.1	<0.1	**0.2**	<0.1	<0.1
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	<0.1	**0.2**	<0.1	<0.1	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	120-12-7	0.1	µg/L	<0.1	**0.1**	<0.1	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S	IT04M	IT04D	IT05S	IT05M
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
				ES1110580-001	ES1110580-002	ES1110580-003	ES1110580-004	ES1110580-005
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L	<0.1	**0.3**	<0.1	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L	<0.1	**0.1**	<0.1	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L	<0.1	**0.2**	**4.3**	<0.1	<0.1
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L	<0.1	**0.5**	<0.1	<0.1	<0.1
Pyrene	129-00-0	0.1	µg/L	<0.1	**0.4**	<0.1	<0.1	<0.1
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**107**	**123**	**113**	**118**
Toluene-D8	2037-26-5	0.1	%	**106**	**102**	**98.2**	**88.8**	**92.0**
4-Bromofluorobenzene	460-00-4	0.1	%	**97.2**	**98.0**	**96.1**	**83.7**	**91.1**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**75.8**	**57.9**	**74.7**	**68.8**	**62.7**
Phenol-d6	13127-88-3	0.1	%	**51.7**	**39.4**	**50.2**	**47.8**	**43.7**
2-Chlorophenol-D4	93951-73-6	0.1	%	**113**	**104**	**96.7**	**104**	**112**
2.4.6-Tribromophenol	118-79-6	0.1	%	**90.4**	**84.4**	**89.1**	**81.4**	**83.6**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**83.7**	**69.0**	**72.1**	**67.0**	**89.8**
Anthracene-d10	1719-06-8	0.1	%	**95.3**	**91.7**	**97.5**	**95.0**	**93.7**
4-Terphenyl-d14	1718-51-0	0.1	%	**101**	**83.3**	**89.7**	**88.2**	**84.8**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D	QC643	QC644	QC646	----
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----
				ES1110580-006	ES1110580-007	ES1110580-008	ES1110580-009	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Aluminium	7429-90-5	10	µg/L	**9090**	**9140**	**20**	----	----
Selenium	7782-49-2	2	µg/L	**5**	**4**	<2	----	----
Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Arsenic	7440-38-2	0.5	µg/L	**14.7**	**16.1**	**1.0**	----	----
Barium	7440-39-3	1	µg/L	**37**	**37**	**117**	----	----
Beryllium	7440-41-7	0.1	µg/L	**13.9**	**14.1**	<0.1	----	----
Cadmium	7440-43-9	0.2	µg/L	**0.7**	**1.1**	<0.2	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Cobalt	7440-48-4	0.2	µg/L	**145**	**142**	**0.7**	----	----
Copper	7440-50-8	1	µg/L	<1	<1	**11**	----	----
Lead	7439-92-1	0.2	µg/L	**8.0**	**8.5**	**0.3**	----	----
Manganese	7439-96-5	0.5	µg/L	**7380**	**7230**	**187**	----	----
Nickel	7440-02-0	0.5	µg/L	**171**	**169**	**1.8**	----	----
Silver	7440-22-4	0.1	µg/L	**0.2**	<0.1	<0.1	----	----
Vanadium	7440-62-2	0.5	µg/L	**2.0**	**1.8**	**1.0**	----	----
Zinc	7440-66-6	5	µg/L	**456**	**461**	**5**	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Aluminium	7429-90-5	5	µg/L	----	----	----	<5	----
Antimony	7440-36-0	0.2	µg/L	----	----	----	<0.2	----
Selenium	7782-49-2	0.2	µg/L	----	----	----	<0.2	----
Arsenic	7440-38-2	0.2	µg/L	----	----	----	<0.2	----
Barium	7440-39-3	0.5	µg/L	----	----	----	<0.5	----
Beryllium	7440-41-7	0.1	µg/L	----	----	----	<0.1	----
Cadmium	7440-43-9	0.05	µg/L	----	----	----	**0.54**	----
Chromium	7440-47-3	0.2	µg/L	----	----	----	<0.2	----
Cobalt	7440-48-4	0.1	µg/L	----	----	----	<0.1	----
Copper	7440-50-8	0.5	µg/L	----	----	----	<0.5	----
Lead	7439-92-1	0.1	µg/L	----	----	----	**0.2**	----
Manganese	7439-96-5	0.5	µg/L	----	----	----	<0.5	----
Nickel	7440-02-0	0.5	µg/L	----	----	----	<0.5	----
Silver	7440-22-4	0.1	µg/L	----	----	----	<0.1	----
Vanadium	7440-62-2	0.2	µg/L	----	----	----	<0.2	----
Zinc	7440-66-6	1	µg/L	----	----	----	**4**	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	<0.004	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D	QC643	QC644	QC646	----
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----
				ES1110580-006	ES1110580-007	ES1110580-008	ES1110580-009	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser - Continued								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	**0.005**	<0.004	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**90**	**90**	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	**120**	**120**	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	**120**	**120**	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	**90**	**100**	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	**30**	**40**	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	**100**	**100**	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	**100**	**100**	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	**34**	**32**	<1	<1	----
Toluene	108-88-3	2	µg/L	**8**	**8**	<5	<5	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	**12**	**13**	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	**5**	**5**	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	**17**	**18**	<2	<2	----
^ Sum of BTEX	----	1	µg/L	**59**	**58**	<1	<1	----
Naphthalene	91-20-3	5	µg/L	**64**	**60**	<5	<5	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
o-Cresol	95-48-7	0.1	µg/L	**2.1**	**2.0**	<0.1	<0.1	----
p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L	**12.8**	**10.3**	<0.1	**0.2**	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.05	<0.05	<0.05	----
Phenol	108-95-2	0.1	µg/L	<0.1	<0.1	<0.1	**0.1**	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D	QC643	QC644	QC646	----
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----
				ES1110580-006	ES1110580-007	ES1110580-008	ES1110580-009	----
EP132A: Phenolic Compounds - Continued								
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
2-Methylnaphthalene	91-57-6	0.1	µg/L	**1.3**	**1.0**	**0.1**	<0.1	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	**0.3**	<0.1	----
Acenaphthylene	208-96-8	0.1	µg/L	**0.1**	**0.2**	**0.1**	<0.1	----
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	**0.2**	<0.1	----
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	**0.07**	<0.05	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	**0.5**	<0.1	----
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	**0.3**	<0.1	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Naphthalene	91-20-3	0.1	µg/L	**80.2**	**63.7**	**0.4**	<0.1	----
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
Phenanthrene	85-01-8	0.1	µg/L	<0.1	<0.1	**0.9**	<0.1	----
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	**0.6**	<0.1	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**131**	**100**	**129**	**123**	----
Toluene-D8	2037-26-5	0.1	%	**110**	**98.0**	**98.8**	**95.1**	----
4-Bromofluorobenzene	460-00-4	0.1	%	**105**	**96.0**	**96.6**	**95.7**	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**74.0**	**70.9**	**73.2**	**53.5**	----
Phenol-d6	13127-88-3	0.1	%	**48.6**	**45.1**	**48.5**	**31.7**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**97.8**	**103**	**114**	**100**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**89.7**	**89.8**	**127**	**78.8**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**75.9**	**66.5**	**118**	**76.8**	----
Anthracene-d10	1719-06-8	0.1	%	**104**	**96.8**	**126**	**92.2**	----

Analytical Results

Sub-Matrix: WATER			Client sample ID	IT05D	QC643	QC644	QC646	----
			Client sampling date / time	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----
Compound	CAS Number	LOR	Unit	ES1110580-006	ES1110580-007	ES1110580-008	ES1110580-009	----
EP132T: Base/Neutral Extractable Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.1	%	**127**	**86.6**	**129**	**84.8**	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Jennifer Cullen Due: 27/5/11

From: McGrath, Kate [Kate.McGrath@aecom.com]
Sent: Friday, 20 May 2011 10:50 AM
To: Jennifer Cullen
Cc: Lee, Amanda; Davis, Anthony; Hansen, Catherine
Subject: Barangaroo Analysis Request -Water samples

Hi Jenny

For the water samples collected and submitted yesterday to the lab (19/5/11) please disregard the analysis request on the COC and refer to the requests below.

1 2

Work order for Additional VMP DGI job No: 60153531/6.1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646 analysed for

3 4 5 6 7 8 9

- Ultra-trace PAHs and phenols
- Standard level TPH C6 – C36 and BTEX
- Ultra trace metals – As, Ba, Be, Bd, Cr, Co, Cu, Mn, Hg, Ni, Pb, V, Zn, Al, Sb, Se and Ag
- Free and WAD Cyanide

Please send QC645 to Labmark for the above analysis. → Forwarded to Labmark.

Work order for HHERA 60153531 1.54150086 .1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D analysed for

ES1110584

Unfiltered analysis:

- Ultra trace dibenzofuran
- Styrene
- Ammonia as N
- Cr III and Cr VI

Subcon / Forward Lab / Split WO
Lab / Analysis: Labmark
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES1110580
Attach By PO / Internal Sheet:

Filtrate (twice lab filtered and lowest LOR) and Filter Paper Analysis:

- PAHs
- Phenols
- TPH C6 – C36
- BTEX
- Styrene
- Dibenzofuran
- Ammonia as N
- Free and WAD Cyanide
- Metals - Pb, As, Cd, Cr (III and VI), Co, Cu, Hg, Ni, Vn, Zn,

Split into ES1110584

Regards,

Kate McGrath
Professional Scientist

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1110580**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1	Page	: 1 of 2
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2010HLAENV0384 (EN/004/10)
Site	: Barangaroo		
Sampler	: DS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 19-MAY-2011	Issue Date	: 23-MAY-2011 16:51
Client Requested Due Date	: 27-MAY-2011	Scheduled Reporting Date	: **27-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.4'C - Ice present
No. of coolers/boxes	: 5 Hard	No. of samples received	: 9
Security Seal	: Intact.	No. of samples analysed	: 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Sample QC645 will be forwarded to Labmark as per COC.**
- **Samples for HHERA 60153531 1.S415008/6.1 have been logged under work order number ES1110584.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG093A-F Dissolved metals in saline water by ORC-ICPMS	WATER - EG093B-F Dissolved Metals in Saline Water Suite B by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-04 TPH/BTEX
ES1110580-001	19-MAY-2011 15:00	IT04S	✓	✓	✓	✓	✓	✓	✓
ES1110580-002	19-MAY-2011 15:00	IT04M	✓	✓	✓	✓	✓	✓	✓
ES1110580-003	19-MAY-2011 15:00	IT04D	✓	✓	✓	✓	✓	✓	✓
ES1110580-004	19-MAY-2011 15:00	IT05S	✓	✓	✓	✓	✓	✓	✓
ES1110580-005	19-MAY-2011 15:00	IT05M	✓	✓	✓	✓	✓	✓	✓
ES1110580-006	19-MAY-2011 15:00	IT05D	✓	✓	✓	✓	✓	✓	✓
ES1110580-007	19-MAY-2011 15:00	QC643	✓	✓	✓	✓	✓	✓	✓
ES1110580-008	19-MAY-2011 15:00	QC644	✓	✓	✓	✓	✓	✓	✓
ES1110580-009	19-MAY-2011 15:00	QC646	✓	✓	✓	✓	✓	✓	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA)	Email	anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV)	Email	anthony.davis@aecom.com
- Chain of Custody (CoC) (COC)	Email	anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	anthony.davis@aecom.com
- EDI Format - XTab (XTAB)	Email	anthony.davis@aecom.com

MS KATE MCGRATH

- *AU Certificate of Analysis - NATA (COA)	Email	kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN)	Email	kate.obrien@aecom.com
- Chain of Custody (CoC) (COC)	Email	kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	kate.obrien@aecom.com
- EDI Format - XTab (XTAB)	Email	kate.obrien@aecom.com

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1110580**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Barangaroo		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Order number	: ----		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Quality Control Report contains the following information:

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

NATA
WORLD RECOGNISED ACCREDITATION

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*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035F: Dissolved Mercury by FIMS (QC Lot: 1801102)									
EB1109723-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1110524-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 1801104)									
ES1110580-003	IT04D	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1110584-010	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1803315)									
ES1110584-009	Anonymous	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	45.2	44.8	0.7	0% - 20%
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	0.5	0.7	30.7	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	4620	4650	0.6	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	33.1	33.6	1.4	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	0.8	<0.5	47.6	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	125	125	0.0	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	6	6	0.0	No Limit
		EG093A-F: Aluminium	7429-90-5	10	µg/L	30	30	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	66	68	3.0	0% - 50%
ES1110580-001	IT04S	EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG093A-F: Silver	7440-22-4	0.1	µg/L	0.3	0.3	0.0	No Limit
		EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.7	0.7	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	0.8	0.9	17.2	No Limit
		EG093A-F: Antimony	7440-36-0	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	0.6	1.1	60.4	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Manganese	7439-96-5	0.5	µg/L	33.8	33.9	0.0	0% - 20%
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	9.1	9.9	8.4	0% - 50%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG093A-F: Barium	7440-39-3	1	µg/L	63	62	0.0	0% - 20%
		EG093A-F: Copper	7440-50-8	1	µg/L	30	30	0.0	0% - 20%
		EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	20	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1803315) - continued									
ES1110580-001	IT04S	EG093A-F: Zinc	7440-66-6	5	µg/L	18	18	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1803316)									
ES1110580-001	IT04S	EG093B-F: Selenium	7782-49-2	2	µg/L	<2	<2	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1809516)									
EB1109933-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	0.6	0.5	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.4	1.5	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.8	0.8	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	110	108	1.9	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	0.9	1.0	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	1.1	1.0	0.0	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	2.0	2.0	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	5	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	6	21	106	No Limit
EB1109933-012	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.5	0.6	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.2	0.1	0.0	No Limit
		EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Antimony	7440-36-0	0.2	µg/L	0.9	0.9	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.4	1.4	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Barium	7440-39-3	0.5	µg/L	33.3	33.7	1.1	0% - 20%
		EG094A-F: Copper	7440-50-8	0.5	µg/L	0.8	0.7	0.0	No Limit
		EG094A-F: Manganese	7439-96-5	0.5	µg/L	86.0	85.4	0.6	0% - 20%
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	4.0	3.9	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	4	0.0	No Limit
		EG094A-F: Aluminium	7429-90-5	5	µg/L	8	<5	46.9	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1809517)									
EB1109933-012	Anonymous	EG094B-F: Selenium	7782-49-2	0.2	µg/L	14.8	15.6	5.3	0% - 20%
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1801015)									
ES1110580-001	IT04S	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1110584-007	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1801014)									
ES1110580-001	IT04S	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1110584-007	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1800174)									
ES1110473-004	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
ES1110473-006	Anonymous	EP071: C15 - C28 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
		EP071: C29 - C36 Fraction	----	50	µg/L	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1805202)									
ES1110536-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1110580-001	IT04S	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1800174)									
ES1110473-004	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
ES1110473-006	Anonymous	EP071: >C10 - C16 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C16 - C34 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	µg/L	<100	<100	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1805202)									
ES1110536-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1110580-001	IT04S	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1805202)									
ES1110536-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1110580-001	IT04S	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1801102)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	112	86	116
EG035F: Dissolved Mercury by FIMS (QCLot: 1801104)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	109	86	116
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1803315)								
EG093A-F: Aluminium	7429-90-5	10	µg/L	<10	50 µg/L	108	80	128
EG093A-F: Antimony	7440-36-0	0.5	µg/L	<0.5	----	----	----	----
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	116	85	125
EG093A-F: Barium	7440-39-3	1	µg/L	<1	10 µg/L	95.3	81	129
EG093A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	97.6	80	122
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	91.9	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	107	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	96.6	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	93.6	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	101	87	123
EG093A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	95.6	90	122
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	84	124
EG093A-F: Silver	7440-22-4	0.1	µg/L	<0.1	1 µg/L	89.3	70	130
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	97.2	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	106	82	128
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1803316)								
EG093B-F: Selenium	7782-49-2	2	µg/L	<2	10 µg/L	101	74	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809516)								
EG094A-F: Aluminium	7429-90-5	5	µg/L	<5	50 µg/L	98.0	78	132
EG094A-F: Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	# 0.6	10 µg/L	99.6	86	124
EG094A-F: Barium	7440-39-3	0.5	µg/L	<0.5	10 µg/L	104	71	125
EG094A-F: Beryllium	7440-41-7	0.1	µg/L	<0.1	10 µg/L	101	73	127
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	91.3	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.7	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	108	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	107	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	104	82	120
EG094A-F: Manganese	7439-96-5	0.5	µg/L	<0.5	10 µg/L	101	82	126
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	99.4	86	122

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809516) - continued								
EG094A-F: Silver	7440-22-4	0.1	µg/L	<0.1	10 µg/L	111	61	125
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	# 80.8	83	117
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	107	79	133
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809517)								
EG094B-F: Selenium	7782-49-2	0.2	µg/L	<0.2	10 µg/L	82.5	75	123
EK025G: Free cyanide by Discrete Analyser (QCLot: 1801015)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	107	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1801014)								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	107	70	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800174)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	88.1	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	500 µg/L	100	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	102	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1805202)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	77.9	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800174)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	97.3	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	600 µg/L	97.4	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	110	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1805202)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	75.8	75	127
EP080: BTEXN (QCLot: 1805202)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	84.0	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	110	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	80.8	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	91.7	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	85.9	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	91.0	72.9	127
EP132A: Phenolic Compounds (QCLot: 1800601)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	# 123	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	97.6	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	84.2	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	94.8	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	83.0	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	101	70.2	117

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
EP132A: Phenolic Compounds (QCLot: 1800601) - continued								
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	99.7	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	107	40	128
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	84.6	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	79.5	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	74.2	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	# 97.3	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	# 61.6	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	99.8	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	101	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	83.2	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800601)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	102	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	97.2	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	104	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	99.6	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	104	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	111	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	110	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	111	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	102	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	95.8	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	83.0	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	82.8	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	104	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	92.0	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	93.4	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	105	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	102	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	90.9	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	76.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	104	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	113	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	103	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	105	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1801102)							
EB1109723-004	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	120	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 1801104)							
ES1110580-004	IT05S	EG035F: Mercury	7439-97-6	0.0100 mg/L	90.0	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1803315)							
ES1110580-001	IT04S	EG093A-F: Arsenic	7440-38-2	50 µg/L	108	70	130
		EG093A-F: Barium	7440-39-3	50 µg/L	86.5	70	130
		EG093A-F: Beryllium	7440-41-7	50 µg/L	91.2	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	85.9	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	96.8	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	93.2	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	84.5	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	97.0	70	130
		EG093A-F: Manganese	7439-96-5	50 µg/L	96.1	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	88.8	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	86.0	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	81.9	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809516)							
EB1109933-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	70	130
		EG094A-F: Barium	7440-39-3	50 µg/L	94.7	70	130
		EG094A-F: Beryllium	7440-41-7	50 µg/L	99.0	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	92.7	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	99.0	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	124	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	102	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	87.1	70	130
		EG094A-F: Manganese	7439-96-5	50 µg/L	92.8	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	105	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	108	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	103	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1801015)							
ES1110580-001	IT04S	EK025G: Free Cyanide	----	0.2 mg/L	81.0	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1801014)							
ES1110580-001	IT04S	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	# 59.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800174)							

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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800174) - continued							
ES1110473-006	Anonymous	EP071: C10 - C14 Fraction	----	40 µg/L	101	74	150
		EP071: C15 - C28 Fraction	----	50 µg/L	130	77	153
		EP071: C29 - C36 Fraction	----	40 µg/L	82.3	67	153
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1805202)							
ES1110536-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	92.1	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800174)							
ES1110473-006	Anonymous	EP071: >C10 - C16 Fraction	----	50 µg/L	81.8	74	150
		EP071: >C16 - C34 Fraction	----	60 µg/L	129	77	153
		EP071: >C34 - C40 Fraction	----	30 µg/L	92.5	67	153
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1805202)							
ES1110536-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	88.1	70	130
EP080: BTEXN (QCLot: 1805202)							
ES1110536-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	93.6	70	130
		EP080: Toluene	108-88-3	25 µg/L	89.3	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	95.1	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	95.9	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.2	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	96.2	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1110580**	Page	: 1 of 8
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo VMP DGI 60153531 6 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Barangaroo		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Order number	: ----		
		No. of samples received	: 9
Quote number	: SY/418/10 V2	No. of samples analysed	: 9

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	---	16-JUN-2011	----	**26-MAY-2011**	16-JUN-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644	**19-MAY-2011**	**25-MAY-2011**	15-NOV-2011	✓	**25-MAY-2011**	15-NOV-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered							
QC646	**19-MAY-2011**	**30-MAY-2011**	15-NOV-2011	✓	**30-MAY-2011**	15-NOV-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**25-MAY-2011**	02-JUN-2011	✓	**25-MAY-2011**	02-JUN-2011	✓
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**24-MAY-2011**	02-JUN-2011	✓	**24-MAY-2011**	02-JUN-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							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**23-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**26-MAY-2011**	02-JUN-2011	✓	**26-MAY-2011**	02-JUN-2011	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**23-MAY-2011**	26-MAY-2011	✓	**24-MAY-2011**	02-JUL-2011	✓
Amber VOC Vial - HCl							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**26-MAY-2011**	02-JUN-2011	✓	**26-MAY-2011**	02-JUN-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**26-MAY-2011**	02-JUN-2011	✓	**26-MAY-2011**	02-JUN-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-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
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-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: **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	4	34	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	2	**50.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	19	**10.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	2	34	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	1	2	**50.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	2	34	**5.9**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	19	**5.3**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	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
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)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite B by ORC-ICPMS	EG093B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite B by ORC-ICPMS	EG094B-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH 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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Method Blank (MB) Values							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2130248-002	----	**Arsenic**	7440-38-2	0.6 µg/L	0.2 µg/L	**Blank result exceeds permitted value**
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2130248-003	----	**Vanadium**	7440-62-2	80.8 %	83-117%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	2119027-002	----	**2-Chlorophenol**	95-57-8	123 %	74.2-119%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2119027-002	----	**Pentachlorophenol**	87-86-5	97.3 %	32.6-89.4%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2119027-002	----	**Phenol**	108-95-2	61.6 %	26.5-58.7%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK028G: Weak Acid Dissociable Cyanide By Discrete A	ES1110580-001	IT04S	**Weak Acid Dissociable Cyanide**	----	59.4 %	70-130%	**Recovery less than lower data quality objective**

- **For all matrices, no Duplicate 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							
EP132S: Acid Extractable Surrogates	ES1110580-008	QC644	**2.4.6-Tribromophenol**	118-79-6	127 %	10-123 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1110580-008	QC644	**2-Fluorobiphenyl**	321-60-8	118 %	43-116 %	**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.**

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1110584**	Page	: 1 of 19
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo HHERA 60153531 1S4150086 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Site	: Barangaroo		
		No. of samples received	: 27
Quote number	: SY/418/10 V2	No. of samples analysed	: 27

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **EA055-103: Moisture content was not analysed as sample was not suitable for moisture analysis**
- **EG094: LCS recovery for V falls outside ALS Dynamic Control Limit. However, it is within the acceptance criteria based on ALS DQO. No further action is required.**
- **EG094: Zn results for sample ES1110584-13 confirmed by reanalysis.**
- **EK055G LOR raised for NH3 on the various samples due to sample matrix.**
- **EP075: 'Sum of PAH' is the sum of the USEPA 16 priority PAHs**
- **EP08/EP074:Positive results for Flitrate blank have been confirmed by re-analaysis.**
- **EP080:Level of reporting raised for toluene due to ambient background levels in the laboratory.**
- **EP132, EP075: Surrogates not determined due to sample matrix interferences.**
- **Filtrate samples were produced using a filtering procedure requested by AECOM. Where requested a 500mL amber glass unpreserved bottle was filtered through an 'Advantec Cellulose Acetate 0.45µm Membrane Filter'. This filter paper was then analysed and is labeled as 'FP1' for each sample. The resulting filtrate was collected back into the original sample bottle and then filtered again for a second time through a new filter paper. The second filter paper was then analysed and is labeled 'FP2' for each sample. The resulting filtrate from the second filtering was collected into a clean bottle and analysed with a label 'Filtrate' for each sample. Before filtering any samples, ALS conducted the same filtering procedure using Ultra High Purity Water from the laboratory. The resulting 'FP1' filter paper, 'FP2' filter paper and the Filtrate were then analysed to provide blank results.**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S FP1	IT04M FP1	IT04D FP1	IT05S FP1	IT05M FP1
				Client sampling date / time: [20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]
				ES1110584-014	ES1110584-015	ES1110584-016	ES1110584-017	ES1110584-018
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	0.5	µg/filter	<0.5	<0.5	<0.5	<0.5	<0.5
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/filter	<10	<10	<20	<10	<20
4-Chloro-3-Methylphenol	59-50-7	10	µg/filter	<10	<10	<20	<10	<20
m-Cresol	108-39-4	10	µg/filter	<10	<10	<20	<10	<20
o-Cresol	95-48-7	10	µg/filter	<10	<10	<20	<10	<20
p-Cresol	106-44-5	10	µg/filter	<10	<10	<20	<10	<20
2.4-Dichlorophenol	120-83-2	10	µg/filter	<10	<10	<20	<10	<20
2.6-Dichlorophenol	87-65-0	10	µg/filter	<10	<10	<20	<10	<20
2.4-Dimethylphenol	105-67-9	10	µg/filter	<10	<10	**60**	<10	<20
Hexachlorophene	70-30-4	10	µg/filter	<10	<10	<20	<10	<20
2-Nitrophenol	88-75-5	10	µg/filter	<10	<10	<20	<10	<20
4-Nitrophenol	100-02-7	10	µg/filter	<10	<10	<20	<10	<20
Pentachlorophenol	87-86-5	10	µg/filter	<10	<10	<20	<10	<20
Phenol	108-95-2	10	µg/filter	<10	<10	<20	<10	<20
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/filter	<10	<10	<20	<10	<20
2.4.5-Trichlorophenol	95-95-4	10	µg/filter	<10	<10	<20	<10	<20
2.4.6-Trichlorophenol	88-06-2	10	µg/filter	<10	<10	<20	<10	<20
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<20	<10	<20
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	**20**	<20	<10	<20
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<20	<10	<20
Acenaphthene	83-32-9	10	µg/filter	<10	**20**	<20	<10	<20
Acenaphthylene	208-96-8	10	µg/filter	<10	**60**	<20	**40**	<20
Anthracene	120-12-7	10	µg/filter	<10	**110**	<20	**80**	<20
Benz(a)anthracene	56-55-3	10	µg/filter	<10	**390**	<20	**260**	<20
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	**540**	<20	**360**	<20
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	**740**	<20	**380**	<20
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	**280**	<20	**170**	<20
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	**120**	<20	**100**	<20
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	**380**	<20	**220**	<20
Chrysene	218-01-9	10	µg/filter	<10	**440**	<20	**290**	<20
Coronene	191-07-1	10	µg/filter	<10	<10	<20	<10	<20
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	**10**	<20	**20**	<20
Fluoranthene	206-44-0	10	µg/filter	<10	**640**	<20	**470**	<20
Fluorene	86-73-7	10	µg/filter	<10	**30**	<20	<10	<20
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	**110**	<20	**80**	<20

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S FP1	IT04M FP1	IT04D FP1	IT05S FP1	IT05M FP1
				Client sampling date / time: [20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]
				ES1110584-014	ES1110584-015	ES1110584-016	ES1110584-017	ES1110584-018
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	<100
Naphthalene	91-20-3	10	µg/filter	<10	**70**	**40**	**20**	<20
Perylene	198-55-0	10	µg/filter	<10	**170**	<20	**110**	<20
Phenanthrene	85-01-8	10	µg/filter	<10	**280**	<20	**260**	<20
Pyrene	129-00-0	10	µg/filter	<10	**770**	<20	**480**	<20
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**14.1**	**Not Determined**	**Not Determined**	**Not Determined**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**160**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D FP1	Filter Paper Blank FP1	IT04S FP2	IT04M FP2	IT04D FP2
				Client sampling date / time: [20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]
				ES1110584-019	ES1110584-020	ES1110584-021	ES1110584-022	ES1110584-023
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	0.5	µg/filter	<0.5	<0.5	<0.5	<0.5	<0.5
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/filter	<10	<10	<10	<10	<10
4-Chloro-3-Methylphenol	59-50-7	10	µg/filter	<10	<10	<10	<10	<10
m-Cresol	108-39-4	10	µg/filter	<10	<10	<10	<10	<10
o-Cresol	95-48-7	10	µg/filter	<10	<10	<10	<10	<10
p-Cresol	106-44-5	10	µg/filter	<10	<10	<10	<10	<10
2.4-Dichlorophenol	120-83-2	10	µg/filter	<10	<10	<10	<10	<10
2.6-Dichlorophenol	87-65-0	10	µg/filter	<10	<10	<10	<10	<10
2.4-Dimethylphenol	105-67-9	10	µg/filter	<10	<10	<10	<10	<10
Hexachlorophene	70-30-4	10	µg/filter	<10	<10	<10	<10	<10
2-Nitrophenol	88-75-5	10	µg/filter	<10	<10	<10	<10	<10
4-Nitrophenol	100-02-7	10	µg/filter	<10	<10	<10	<10	<10
Pentachlorophenol	87-86-5	10	µg/filter	<10	<10	<10	<10	<10
Phenol	108-95-2	10	µg/filter	<10	<10	<10	<10	<10
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/filter	<10	<10	<10	<10	<10
2.4.5-Trichlorophenol	95-95-4	10	µg/filter	<10	<10	<10	<10	<10
2.4.6-Trichlorophenol	88-06-2	10	µg/filter	<10	<10	<10	<10	<10
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<10	<10	<10	<10
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	<10	<10	<10	<10
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthene	83-32-9	10	µg/filter	<10	<10	<10	<10	<10
Acenaphthylene	208-96-8	10	µg/filter	<10	<10	<10	<10	<10
Anthracene	120-12-7	10	µg/filter	<10	<10	<10	<10	<10
Benz(a)anthracene	56-55-3	10	µg/filter	<10	<10	<10	<10	<10
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	<10	<10	<10	<10
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<10	<10	<10	<10
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<10	<10	<10	<10
Chrysene	218-01-9	10	µg/filter	<10	<10	<10	<10	<10
Coronene	191-07-1	10	µg/filter	<10	<10	<10	<10	<10
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<10	<10	<10	<10
Fluoranthene	206-44-0	10	µg/filter	<10	<10	<10	<10	<10
Fluorene	86-73-7	10	µg/filter	<10	<10	<10	<10	<10
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<10	<10	<10	<10

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D FP1	Filter Paper Blank FP1	IT04S FP2	IT04M FP2	IT04D FP2
				Client sampling date / time: [20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]
				ES1110584-019	ES1110584-020	ES1110584-021	ES1110584-022	ES1110584-023
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	<100
Naphthalene	91-20-3	10	µg/filter	**270**	<10	<10	<10	<10
Perylene	198-55-0	10	µg/filter	<10	<10	<10	<10	<10
Phenanthrene	85-01-8	10	µg/filter	<10	<10	<10	<10	<10
Pyrene	129-00-0	10	µg/filter	<10	<10	<10	<10	<10
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05S FP2	IT05M FP2	IT05D FP2	Filter Paper Blank FP2	----
Client sampling date / time				[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	----
				ES1110584-024	ES1110584-025	ES1110584-026	ES1110584-027	----
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	0.5	µg/filter	<0.5	<0.5	<0.5	<0.5	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	10	µg/filter	<10	<20	<10	<10	----
4-Chloro-3-Methylphenol	59-50-7	10	µg/filter	<10	<20	<10	<10	----
m-Cresol	108-39-4	10	µg/filter	<10	<20	<10	<10	----
o-Cresol	95-48-7	10	µg/filter	<10	<20	<10	<10	----
p-Cresol	106-44-5	10	µg/filter	<10	<20	<10	<10	----
2.4-Dichlorophenol	120-83-2	10	µg/filter	<10	<20	<10	<10	----
2.6-Dichlorophenol	87-65-0	10	µg/filter	<10	<20	<10	<10	----
2.4-Dimethylphenol	105-67-9	10	µg/filter	<10	<20	<10	<10	----
Hexachlorophene	70-30-4	10	µg/filter	<10	<20	<10	<10	----
2-Nitrophenol	88-75-5	10	µg/filter	<10	<20	<10	<10	----
4-Nitrophenol	100-02-7	10	µg/filter	<10	<20	<10	<10	----
Pentachlorophenol	87-86-5	10	µg/filter	<10	<20	<10	<10	----
Phenol	108-95-2	10	µg/filter	<10	<20	<10	<10	----
2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/filter	<10	<20	<10	<10	----
2.4.5-Trichlorophenol	95-95-4	10	µg/filter	<10	<20	<10	<10	----
2.4.6-Trichlorophenol	88-06-2	10	µg/filter	<10	<20	<10	<10	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	10	µg/filter	<10	<20	<10	<10	----
2-Methylnaphthalene	91-57-6	10	µg/filter	<10	<20	<10	<10	----
7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/filter	<10	<20	<10	<10	----
Acenaphthene	83-32-9	10	µg/filter	<10	<20	<10	<10	----
Acenaphthylene	208-96-8	10	µg/filter	<10	<20	<10	<10	----
Anthracene	120-12-7	10	µg/filter	<10	<20	<10	<10	----
Benz(a)anthracene	56-55-3	10	µg/filter	<10	<20	<10	<10	----
Benzo(a)pyrene	50-32-8	10	µg/filter	<10	<20	<10	<10	----
Benzo(b)fluoranthene	205-99-2	10	µg/filter	<10	<20	<10	<10	----
Benzo(e)pyrene	192-97-2	10	µg/filter	<10	<20	<10	<10	----
Benzo(g.h.i)perylene	191-24-2	10	µg/filter	<10	<20	<10	<10	----
Benzo(k)fluoranthene	207-08-9	10	µg/filter	<10	<20	<10	<10	----
Chrysene	218-01-9	10	µg/filter	<10	<20	<10	<10	----
Coronene	191-07-1	10	µg/filter	<10	<20	<10	<10	----
Dibenz(a.h)anthracene	53-70-3	10	µg/filter	<10	<20	<10	<10	----
Fluoranthene	206-44-0	10	µg/filter	<10	<20	<10	<10	----
Fluorene	86-73-7	10	µg/filter	<10	<20	<10	<10	----
Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/filter	<10	<20	<10	<10	----

Analytical Results

Sub-Matrix: **FILTER PAPER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05S FP2	IT05M FP2	IT05D FP2	Filter Paper Blank FP2	----
Client sampling date / time				[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	[20-MAY-2011]	----
				ES1110584-024	ES1110584-025	ES1110584-026	ES1110584-027	----
EP132B: Polynuclear Aromatic Hydrocarbons - Continued								
N-2-Fluorenyl Acetamide	53-96-3	100	µg/filter	<100	<100	<100	<100	----
Naphthalene	91-20-3	10	µg/filter	<10	<20	**280**	<10	----
Perylene	198-55-0	10	µg/filter	<10	<20	<10	<10	----
Phenanthrene	85-01-8	10	µg/filter	<10	<20	<10	<10	----
Pyrene	129-00-0	10	µg/filter	<10	<20	<10	<10	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
EP132S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
Phenol-d6	13127-88-3	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
Anthracene-d10	1719-06-8	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----
4-Terphenyl-d14	1718-51-0	0.1	%	**Not Determined**	**Not Determined**	**Not Determined**	**Not Determined**	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT04S Unfiltered	IT04M Unfiltered	IT04D Unfiltered	IT05S Unfiltered	IT05M Unfiltered
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
				ES1110584-001	ES1110584-002	ES1110584-003	ES1110584-004	ES1110584-005
EG049F: Dissolved Trivalent Chromium								
^ Trivalent Chromium	16065-83-1	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.10	**1.24**	**1.21**	<0.10	<0.10
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	<5	<5	<5
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	<2	<2	<2	<2
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**114**	**118**	**105**	**105**	**104**
Toluene-D8	2037-26-5	0.1	%	**116**	**111**	**110**	**108**	**110**
4-Bromofluorobenzene	460-00-4	0.1	%	**108**	**91.4**	**96.7**	**96.2**	**93.1**
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**62.7**	**73.3**	**76.9**	**78.3**	**65.7**
Phenol-d6	13127-88-3	0.1	%	**32.2**	**35.5**	**40.4**	**37.1**	**33.8**
2-Chlorophenol-D4	93951-73-6	0.1	%	**65.8**	**73.6**	**75.4**	**73.6**	**68.2**
2.4.6-Tribromophenol	118-79-6	0.1	%	**93.1**	**92.8**	**90.7**	**92.8**	**74.5**
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**44.1**	**50.2**	**48.5**	**48.2**	**45.3**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**37.5**	**41.0**	**47.0**	**37.7**	**44.1**
2-Fluorobiphenyl	321-60-8	0.1	%	**67.8**	**64.2**	**65.6**	**60.0**	**58.0**
Anthracene-d10	1719-06-8	0.1	%	**93.5**	**89.8**	**89.4**	**88.4**	**77.6**
4-Terphenyl-d14	1718-51-0	0.1	%	**114**	**100**	**100**	**102**	**89.3**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	IT05D Unfiltered	IT04S Filtrate	IT04M Filtrate	IT04D Filtrate	IT05S Filtrate
				Client sampling date / time	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
					ES1110584-006	ES1110584-007	ES1110584-008	ES1110584-009	ES1110584-010
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	<0.0001	<0.0001	<0.0001
EG049F: Dissolved Trivalent Chromium									
^ Trivalent Chromium	16065-83-1	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
EG050F: Dissolved Hexavalent Chromium									
Hexavalent Chromium	18540-29-9	0.010	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Arsenic	7440-38-2	0.5	µg/L		----	**0.9**	**0.8**	**0.5**	**1.0**
Cadmium	7440-43-9	0.2	µg/L		----	<0.2	<0.2	<0.2	**0.7**
Chromium	7440-47-3	0.5	µg/L		----	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		----	**1.1**	**1.5**	**45.2**	**0.8**
Copper	7440-50-8	1	µg/L		----	**24**	<1	**6**	**2**
Lead	7439-92-1	0.2	µg/L		----	**0.6**	<0.2	<0.2	**1.0**
Nickel	7440-02-0	0.5	µg/L		----	**19.1**	**3.2**	**33.1**	**3.1**
Vanadium	7440-62-2	0.5	µg/L		----	**1.0**	**0.6**	**0.8**	**1.2**
Zinc	7440-66-6	5	µg/L		----	**20**	<5	**66**	**55**
EK025G: Free cyanide by Discrete Analyser									
Free Cyanide	----	0.004	mg/L		----	<0.004	<0.004	<0.004	<0.004
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser									
Weak Acid Dissociable Cyanide	----	0.004	mg/L		----	<0.004	<0.004	<0.004	<0.004
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		**2.47**	<0.10	**1.15**	**1.28**	<0.10
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	5	µg/L		<5	<5	<5	<5	<5
EP075H: Anilines and Benzidines									
Dibenzofuran	132-64-9	2	µg/L		<2	<2	<2	<2	<2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		----	<20	<20	<20	<20
C10 - C14 Fraction	----	50	µg/L		----	<50	<50	<50	<50
C15 - C28 Fraction	----	100	µg/L		----	<100	<100	<100	<100
C29 - C36 Fraction	----	50	µg/L		----	<50	<50	<50	<50
^ C10 - C36 Fraction (sum)	----	50	µg/L		----	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft									
C6 - C10 Fraction	----	20	µg/L		----	<20	<20	<20	<20
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L		----	<20	<20	<20	<20
>C10 - C16 Fraction	----	100	µg/L		----	<100	<100	<100	<100

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D Unfiltered	IT04S Filtrate	IT04M Filtrate	IT04D Filtrate	IT05S Filtrate
Client sampling date / time				19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
				ES1110584-006	ES1110584-007	ES1110584-008	ES1110584-009	ES1110584-010
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C16 - C34 Fraction	----	100	µg/L	----	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	µg/L	----	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	100	µg/L	----	<100	<100	<100	<100
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	----	<1	<1	**3**	<1
Toluene	108-88-3	2	µg/L	----	<5	<5	<5	<5
Ethylbenzene	100-41-4	2	µg/L	----	**2**	**2**	**4**	**2**
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	----	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L	----	<2	<2	<2	<2
^ Total Xylenes	1330-20-7	2	µg/L	----	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L	----	**2**	**2**	**7**	**2**
Naphthalene	91-20-3	5	µg/L	----	<5	<5	<5	<5
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	----	<0.05	<0.05	**0.07**	<0.05
m-Cresol	108-39-4	0.1	µg/L	----	<0.1	<0.1	**1.6**	<0.1
o-Cresol	95-48-7	0.1	µg/L	----	<0.1	<0.1	**3.5**	<0.1
p-Cresol	106-44-5	0.1	µg/L	----	<0.1	**0.1**	**0.3**	<0.1
2.4-Dichlorophenol	120-83-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2.6-Dichlorophenol	87-65-0	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2.4-Dimethylphenol	105-67-9	0.1	µg/L	----	<0.1	<0.1	**8.3**	<0.1
Hexachlorophene	70-30-4	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	88-75-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	100-02-7	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	87-86-5	0.05	µg/L	----	<0.05	<0.05	<0.05	<0.05
Phenol	108-95-2	0.1	µg/L	----	<0.1	**0.4**	**0.6**	**0.3**
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
2-Methylnaphthalene	91-57-6	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Acenaphthene	83-32-9	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	208-96-8	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Anthracene	120-12-7	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1
Benz(a)anthracene	56-55-3	0.1	µg/L	----	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	IT05D Unfiltered	IT04S FIltrate	IT04M FIltrate	IT04D FIltrate	IT05S FIltrate
				Client sampling date / time	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
					ES1110584-006	ES1110584-007	ES1110584-008	ES1110584-009	ES1110584-010
EP132B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene	50-32-8	0.05	µg/L		----	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	205-99-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Benzo(e)pyrene	192-97-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	207-08-9	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Chrysene	218-01-9	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Coronene	191-07-1	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Fluoranthene	206-44-0	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Fluorene	86-73-7	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Naphthalene	91-20-3	0.1	µg/L		----	<0.1	<0.1	**0.5**	<0.1
Perylene	198-55-0	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Phenanthrene	85-01-8	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
Pyrene	129-00-0	0.1	µg/L		----	<0.1	<0.1	<0.1	<0.1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**106**	**112**	**99.6**	**113**	**118**
Toluene-D8	2037-26-5	0.1	%		**110**	**120**	**95.0**	**108**	**109**
4-Bromofluorobenzene	460-00-4	0.1	%		**91.3**	**111**	**80.1**	**90.3**	**86.6**
EP075S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**47.2**	**96.7**	**111**	**116**	**107**
Phenol-d6	13127-88-3	0.1	%		**20.7**	**41.4**	**41.0**	**43.3**	**38.9**
2-Chlorophenol-D4	93951-73-6	0.1	%		**43.9**	**79.0**	**76.5**	**86.0**	**79.8**
2.4.6-Tribromophenol	118-79-6	0.1	%		**49.6**	**97.1**	**98.0**	**98.1**	**90.7**
EP075T: Base/Neutral Extractable Surrogates									
Nitrobenzene-D5	4165-60-0	0.1	%		**29.9**	**51.5**	**48.7**	**54.6**	**51.6**
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%		**34.6**	**48.4**	**46.0**	**46.2**	**48.7**
2-Fluorobiphenyl	321-60-8	0.1	%		**42.6**	**75.1**	**69.0**	**73.8**	**71.9**
Anthracene-d10	1719-06-8	0.1	%		**51.8**	**93.9**	**95.7**	**96.4**	**91.0**
4-Terphenyl-d14	1718-51-0	0.1	%		**58.2**	**110**	**110**	**111**	**106**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	**130**	**96.0**	**109**	**114**
Toluene-D8	2037-26-5	0.1	%		----	**126**	**89.6**	**102**	**103**
4-Bromofluorobenzene	460-00-4	0.1	%		----	**102**	**91.2**	**80.4**	**81.3**
EP132S: Acid Extractable Surrogates									

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05D Unfiltered	IT04S Filtrate	IT04M Filtrate	IT04D Filtrate	IT05S Filtrate
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00
				ES1110584-006	ES1110584-007	ES1110584-008	ES1110584-009	ES1110584-010
EP132S: Acid Extractable Surrogates - Continued								
2-Fluorophenol	367-12-4	0.1	%	----	**51.2**	**75.4**	**57.9**	**69.3**
Phenol-d6	13127-88-3	0.1	%	----	**34.1**	**51.9**	**41.4**	**48.6**
2-Chlorophenol-D4	93951-73-6	0.1	%	----	**112**	**98.6**	**132**	**110**
2.4.6-Tribromophenol	118-79-6	0.1	%	----	**79.5**	**85.7**	**91.8**	**84.5**
EP132T: Base/Neutral Extractable Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	**86.7**	**78.7**	**117**	**82.0**
Anthracene-d10	1719-06-8	0.1	%	----	**94.9**	**96.6**	**102**	**95.9**
4-Terphenyl-d14	1718-51-0	0.1	%	----	**86.8**	**91.4**	**93.9**	**84.5**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05M Filtrate	IT05D Filtrate	Flitrate Blank	----	----
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----	----
				ES1110584-011	ES1110584-012	ES1110584-013	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG049F: Dissolved Trivalent Chromium								
^ Trivalent Chromium	16065-83-1	0.010	mg/L	<0.010	<0.010	<0.010	----	----
EG050F: Dissolved Hexavalent Chromium								
Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	<0.010	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Arsenic	7440-38-2	0.5	µg/L	**1.8**	**12.8**	----	----	----
Cadmium	7440-43-9	0.2	µg/L	<0.2	**0.4**	----	----	----
Chromium	7440-47-3	0.5	µg/L	<0.5	**0.8**	----	----	----
Cobalt	7440-48-4	0.2	µg/L	**0.2**	**146**	----	----	----
Copper	7440-50-8	1	µg/L	**2**	**4**	----	----	----
Lead	7439-92-1	0.2	µg/L	<0.2	**15.3**	----	----	----
Nickel	7440-02-0	0.5	µg/L	**0.6**	**173**	----	----	----
Vanadium	7440-62-2	0.5	µg/L	**1.7**	**0.8**	----	----	----
Zinc	7440-66-6	5	µg/L	**36**	**451**	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Arsenic	7440-38-2	0.2	µg/L	----	----	<0.2	----	----
Cadmium	7440-43-9	0.05	µg/L	----	----	<0.05	----	----
Chromium	7440-47-3	0.2	µg/L	----	----	<0.2	----	----
Cobalt	7440-48-4	0.1	µg/L	----	----	<0.1	----	----
Copper	7440-50-8	0.5	µg/L	----	----	<0.5	----	----
Lead	7439-92-1	0.1	µg/L	----	----	<0.1	----	----
Nickel	7440-02-0	0.5	µg/L	----	----	<0.5	----	----
Vanadium	7440-62-2	0.2	µg/L	----	----	<0.2	----	----
Zinc	7440-66-6	1	µg/L	----	----	**2**	----	----
EK025G: Free cyanide by Discrete Analyser								
Free Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser								
Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	<0.004	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	<0.10	**2.23**	<0.01	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	5	µg/L	<5	<5	**7**	----	----
EP075H: Anilines and Benzidines								
Dibenzofuran	132-64-9	2	µg/L	<2	<2	<2	----	----
EP080/071: Total Petroleum Hydrocarbons								

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05M Filtrate	IT05D Filtrate	Flitrate Blank	----	----
				Client sampling date / time: 19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----	----
				ES1110584-011	ES1110584-012	ES1110584-013	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued								
C6 - C9 Fraction	----	20	µg/L	<20	**30**	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	**30**	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	**18**	<1	----	----
Toluene	108-88-3	2	µg/L	<5	<5	<5	----	----
Ethylbenzene	100-41-4	2	µg/L	**3**	**3**	**4**	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	**3**	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	**3**	<2	----	----
^ Sum of BTEX	----	1	µg/L	**3**	**24**	**4**	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP132A: Phenolic Compounds								
2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----
4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	<0.05	<0.05	----	----
m-Cresol	108-39-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
o-Cresol	95-48-7	0.1	µg/L	<0.1	**1.9**	<0.1	----	----
p-Cresol	106-44-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4-Dichlorophenol	120-83-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.6-Dichlorophenol	87-65-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4-Dimethylphenol	105-67-9	0.1	µg/L	<0.1	**7.3**	<0.1	----	----
Hexachlorophene	70-30-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2-Nitrophenol	88-75-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
4-Nitrophenol	100-02-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	<0.05	<0.05	----	----
Phenol	108-95-2	0.1	µg/L	**0.2**	**0.5**	<0.1	----	----
2.3.4.6-Tetrachlorophenol	58-90-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2.4.5-Trichlorophenol	95-95-4	0.1	µg/L	<0.1	<0.1	<0.1	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: IT05M Filtrate	IT05D Filtrate	Flitrate Blank	----	----
Client sampling date / time				19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----	----
				ES1110584-011	ES1110584-012	ES1110584-013	----	----
EP132A: Phenolic Compounds - Continued								
2.4.6-Trichlorophenol	88-06-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
EP132B: Polynuclear Aromatic Hydrocarbons								
3-Methylcholanthrene	56-49-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
2-Methylnaphthalene	91-57-6	0.1	µg/L	<0.1	**0.1**	<0.1	----	----
7.12-Dimethylbenz(a)anthracene	57-97-6	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Acenaphthene	83-32-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Acenaphthylene	208-96-8	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Anthracene	120-12-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benz(a)anthracene	56-55-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	<0.05	<0.05	----	----
Benzo(b)fluoranthene	205-99-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(e)pyrene	192-97-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(g.h.i)perylene	191-24-2	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Benzo(k)fluoranthene	207-08-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Chrysene	218-01-9	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Coronene	191-07-1	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Dibenz(a.h)anthracene	53-70-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Fluoranthene	206-44-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Fluorene	86-73-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.1	µg/L	<0.1	<0.1	<0.1	----	----
N-2-Fluorenyl Acetamide	53-96-3	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Naphthalene	91-20-3	0.1	µg/L	<0.1	**6.0**	<0.1	----	----
Perylene	198-55-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Phenanthrene	85-01-8	0.1	µg/L	<0.1	**0.2**	<0.1	----	----
Pyrene	129-00-0	0.1	µg/L	<0.1	<0.1	<0.1	----	----
EP074S: VOC Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**104**	**106**	**125**	----	----
Toluene-D8	2037-26-5	0.1	%	**99.6**	**95.6**	**121**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**80.3**	**82.2**	**110**	----	----
EP075S: Acid Extractable Surrogates								
2-Fluorophenol	367-12-4	0.1	%	**132**	**117**	**112**	----	----
Phenol-d6	13127-88-3	0.1	%	**49.2**	**41.8**	**38.2**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**94.9**	**82.3**	**87.9**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**108**	**97.9**	**101**	----	----
EP075T: Base/Neutral Extractable Surrogates								
Nitrobenzene-D5	4165-60-0	0.1	%	**59.4**	**52.7**	**57.5**	----	----
1.2-Dichlorobenzene-D4	2199-69-1	0.1	%	**54.0**	**50.5**	**58.2**	----	----

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	IT05M Filtrate	IT05D Filtrate	Flitrate Blank	----	----
				Client sampling date / time	19-MAY-2011 15:00	19-MAY-2011 15:00	19-MAY-2011 15:00	----	----
					ES1110584-011	ES1110584-012	ES1110584-013	----	----
EP075T: Base/Neutral Extractable Surrogates - Continued									
2-Fluorobiphenyl	321-60-8	0.1	%		**81.0**	**76.1**	**77.7**	----	----
Anthracene-d10	1719-06-8	0.1	%		**108**	**100**	**103**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**122**	**115**	**121**	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**100**	**102**	**120**	----	----
Toluene-D8	2037-26-5	0.1	%		**94.1**	**90.2**	**89.4**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		**86.4**	**89.2**	**81.8**	----	----
EP132S: Acid Extractable Surrogates									
2-Fluorophenol	367-12-4	0.1	%		**65.2**	**73.0**	**64.8**	----	----
Phenol-d6	13127-88-3	0.1	%		**46.0**	**49.6**	**40.7**	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		**102**	**116**	**106**	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		**81.0**	**99.0**	**83.7**	----	----
EP132T: Base/Neutral Extractable Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**73.4**	**89.3**	**70.8**	----	----
Anthracene-d10	1719-06-8	0.1	%		**93.2**	**104**	**95.7**	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		**80.2**	**90.2**	**83.3**	----	----

Surrogate Control Limits

Sub-Matrix: FILTER PAPER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	147.0
Phenol-d6	13127-88-3	12.5	110.6
2-Chlorophenol-D4	93951-73-6	10.0	116.8
2.4.6-Tribromophenol	118-79-6	10.0	120.1
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	13.3	124.5
1.2-Dichlorobenzene-D4	2199-69-1	11.9	103.9
2-Fluorobiphenyl	321-60-8	11.3	126.1
Anthracene-d10	1719-06-8	13.1	128.1
4-Terphenyl-d14	1718-51-0	10.0	134.7
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	25	121
Phenol-d6	13127-88-3	24	113
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	19	122
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	30	115
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	18	137

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	78.3	133.2
Toluene-D8	2037-26-5	79.1	128.9
4-Bromofluorobenzene	460-00-4	80.8	123.7
EP075S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	10.0	116.6
Phenol-d6	13127-88-3	10.0	69.0
2-Chlorophenol-D4	93951-73-6	20.9	129.7
2.4.6-Tribromophenol	118-79-6	10.0	150.7
EP075T: Base/Neutral Extractable Surrogates			
Nitrobenzene-D5	4165-60-0	29.4	141.7
1.2-Dichlorobenzene-D4	2199-69-1	23.6	120.7
2-Fluorobiphenyl	321-60-8	27.2	134.9
Anthracene-d10	1719-06-8	29.7	140.7
4-Terphenyl-d14	1718-51-0	27.6	143.6
EP080S: TPH(V)/BTEX Surrogates			

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP080S: TPH(V)/BTEX Surrogates - Continued			
1.2-Dichloroethane-D4	17060-07-0	76.4	133.1
Toluene-D8	2037-26-5	79.6	126.8
4-Bromofluorobenzene	460-00-4	79.1	125.0
EP132S: Acid Extractable Surrogates			
2-Fluorophenol	367-12-4	21	100
Phenol-d6	13127-88-3	10	94
2-Chlorophenol-D4	93951-73-6	23	134
2.4.6-Tribromophenol	118-79-6	10	123
EP132T: Base/Neutral Extractable Surrogates			
2-Fluorobiphenyl	321-60-8	43	116
Anthracene-d10	1719-06-8	27	133
4-Terphenyl-d14	1718-51-0	33	141

Jennifer Cullen Due: 30/5/11.

From: McGrath, Kate [Kate.McGrath@aecom.com]
Sent: Friday, 20 May 2011 10:50 AM
To: Jennifer Cullen
Cc: Lee, Amanda; Davis, Anthony; Hansen, Catherine
Subject: Barangaroo Analysis Request -Water samples

Hi Jenny

For the water samples collected and submitted yesterday to the lab (19/5/11) please disregard the analysis request on the COC and refer to the requests below.

Split into ES1110580.

Work order for Additional VMP DGI job No: 60153531/6.1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646 analysed for

- Ultra-trace PAHs and phenols
- Standard level TPH C6 – C36 and BTEX
- Ultra trace metals – As, Ba, Be, Bd, Cr, Co, Cu, Mn, Hg, Ni, Pb, V, Zn, Al, Sb, Se and Ag
- Free and WAD Cyanide

- Please send QC645 to Labmark for the above analysis. Forwarded to labmark.

Work order for HHERA 60153531 1S4150086 .1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D analysed for (1) (2) (3) (4) (5) (6).

Unfiltered analysis:

- Ultra trace dibenzofuran
- Styrene
- Ammonia as N
- Cr III and Cr VI

7-11 filtrate samples.

11-27 filter paper.

Filtrate (twice lab filtered and lowest LOR) and Filter Paper Analysis:

- PAHs
- Phenols
- TPH C6 – C36
- BTEX
- Styrene
- Dibenzofuran
- Ammonia as N
- Free and WAD Cyanide
- Metals - Pb, As, Cd, Cr (III and VI), Co, Cu, Hg, Ni, Vn, Zn,

ES1110580

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: ES1110584
Attach By PO / Internal Sheet:

Regards,

Kate McGrath
Professional Scientist

Environmental Division
Sydney
Work Order
ES1110584
Telephone : +61-2-8784 8555

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1110584**

Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: LEVEL 5, 828 PACIFIC HIGHWAY GORDON NSW, AUSTRALIA 2072	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo HHERA 60153531 1S4150086 1	Page	: 1 of 4
Order number	: ----		
C-O-C number	: ----	Quote number	: ES2010HLAENV0384 (EN/004/10)
Site	: Barangaroo		
Sampler	: DS	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 19-MAY-2011	Issue Date	: 23-MAY-2011 18:16
Client Requested Due Date	: 30-MAY-2011	Scheduled Reporting Date	: **30-MAY-2011**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 2.4'C - Ice present
No. of coolers/boxes	: 5 Hard	No. of samples received	: 27
Security Seal	: Intact.	No. of samples analysed	: 27

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.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Samples for VMP DGI 60153531/6.1 have been logged under work order number ES1110580.**
- **Samples to be lab filtered twice before analysis of filtrate and filter papers.**
- **Samples for HHERA 60153531 1.S415008/6.1 have been logged under work order number ES1110584.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- 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
EA055-103 : Moisture Content		
IT04S FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT04M FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT04D FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05S FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05M FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05D FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
Filter Paper Blank FP1	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT04S FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT04M FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT04D FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05S FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05M FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
IT05D FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
Filter Paper Blank FP2	- Personal Filter	- Lab Split: Managed Moisture for Dry Weight Det.
EP075 : Semivolatile Organic Compounds		
IT04S FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04M FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04D FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05S FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05M FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05D FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
Filter Paper Blank FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04S FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04M FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04D FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05S FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05M FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05D FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
Filter Paper Blank FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
EP132 : Semivolatile Compounds by GCMS(SIM - Ultra-trace)		
IT04S FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04M FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04D FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05S FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05M FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05D FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
Filter Paper Blank FP1	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04S FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04M FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT04D FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05S FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05M FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
IT05D FP2	- Personal Filter	- Soil Glass Jar - Unpreserved
Filter Paper Blank FP2	- Personal Filter	- Soil Glass Jar - Unpreserved

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 - EA055-103 Moisture Content	SOIL - EP075 (solids) Semivolatile Organic Compounds	SOIL - UTO-5S Ultratrace PAH/Phenols
ES1110584-014	[20-MAY-2011]	IT04S FP1	✓	✓	✓
ES1110584-015	[20-MAY-2011]	IT04M FP1	✓	✓	✓
ES1110584-016	[20-MAY-2011]	IT04D FP1	✓	✓	✓
ES1110584-017	[20-MAY-2011]	IT05S FP1	✓	✓	✓
ES1110584-018	[20-MAY-2011]	IT05M FP1	✓	✓	✓
ES1110584-019	[20-MAY-2011]	IT05D FP1	✓	✓	✓
ES1110584-020	[20-MAY-2011]	Filter Paper Blank ...	✓	✓	✓
ES1110584-021	[20-MAY-2011]	IT04S FP2	✓	✓	✓
ES1110584-022	[20-MAY-2011]	IT04M FP2	✓	✓	✓
ES1110584-023	[20-MAY-2011]	IT04D FP2	✓	✓	✓
ES1110584-024	[20-MAY-2011]	IT05S FP2	✓	✓	✓
ES1110584-025	[20-MAY-2011]	IT05M FP2	✓	✓	✓
ES1110584-026	[20-MAY-2011]	IT05D FP2	✓	✓	✓
ES1110584-027	[20-MAY-2011]	Filter Paper Blank ...	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG035F Dissolved Mercury by FIMS	WATER - EG049G-F Dissolved Trivalent Chromium by ICP & DA	WATER - EG050G-F Dissolved Hexavalent Chromium by Discrete Analyser	WATER - EG093A-F Dissolved metals in saline water by ORC-ICPMS	WATER - EK025G Free CN By Discrete Analyser	WATER - EK028G Weak Acid Dissociable Cyanide By Discrete Analyser	WATER - EK055G Ammonia as N By Discrete Analyser	WATER - EP074 (water) Volatile Organic Compounds
ES1110584-001	19-MAY-2011 15:00	IT04S Unfiltered		✓	✓				✓	✓
ES1110584-002	19-MAY-2011 15:00	IT04M Unfiltered		✓	✓				✓	✓
ES1110584-003	19-MAY-2011 15:00	IT04D Unfiltered		✓	✓				✓	✓
ES1110584-004	19-MAY-2011 15:00	IT05S Unfiltered		✓	✓				✓	✓
ES1110584-005	19-MAY-2011 15:00	IT05M Unfiltered		✓	✓				✓	✓
ES1110584-006	19-MAY-2011 15:00	IT05D Unfiltered		✓	✓				✓	✓
ES1110584-007	19-MAY-2011 15:00	IT04S Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-008	19-MAY-2011 15:00	IT04M Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-009	19-MAY-2011 15:00	IT04D Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-010	19-MAY-2011 15:00	IT05S Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-011	19-MAY-2011 15:00	IT05M Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-012	19-MAY-2011 15:00	IT05D Filtrate	✓	✓	✓	✓	✓	✓	✓	✓
ES1110584-013	19-MAY-2011 15:00	Flitrate Blank	✓	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EP075 Semivolatile Organic Compounds	WATER - UTO-5W Ultratrace PAH/Phenols	WATER - W-04 TPH/BTEX
ES1110584-001	19-MAY-2011 15:00	IT04S Unfiltered	✓		
ES1110584-002	19-MAY-2011 15:00	IT04M Unfiltered	✓		
ES1110584-003	19-MAY-2011 15:00	IT04D Unfiltered	✓		
ES1110584-004	19-MAY-2011 15:00	IT05S Unfiltered	✓		
ES1110584-005	19-MAY-2011 15:00	IT05M Unfiltered	✓		
ES1110584-006	19-MAY-2011 15:00	IT05D Unfiltered	✓		
ES1110584-007	19-MAY-2011 15:00	IT04S FIltrate	✓	✓	✓
ES1110584-008	19-MAY-2011 15:00	IT04M FIltrate	✓	✓	✓
ES1110584-009	19-MAY-2011 15:00	IT04D FIltrate	✓	✓	✓
ES1110584-010	19-MAY-2011 15:00	IT05S FIltrate	✓	✓	✓
ES1110584-011	19-MAY-2011 15:00	IT05M FIltrate	✓	✓	✓
ES1110584-012	19-MAY-2011 15:00	IT05D FIltrate	✓	✓	✓
ES1110584-013	19-MAY-2011 15:00	Flitrate Blank	✓	✓	✓

Requested Deliverables

MR ANTHONY DAVIS

- *AU Certificate of Analysis - NATA (COA) Email anthony.davis@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email anthony.davis@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email anthony.davis@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN) Email anthony.davis@aecom.com
- A4 - AU Tax Invoice (INV) Email anthony.davis@aecom.com
- Chain of Custody (CoC) (COC) Email anthony.davis@aecom.com
- EDI Format - ENMRG (ENMRG) Email anthony.davis@aecom.com
- EDI Format - ESDAT (ESDAT) Email anthony.davis@aecom.com
- EDI Format - HLAPro (HLAPro) Email anthony.davis@aecom.com
- EDI Format - XTab (XTAB) Email anthony.davis@aecom.com

MS KATE MCGRATH

- *AU Certificate of Analysis - NATA (COA) Email kate.obrien@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) Email kate.obrien@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) Email kate.obrien@aecom.com
- A4 - AU Sample Receipt Notification - Environmental (SRN) Email kate.obrien@aecom.com
- Chain of Custody (CoC) (COC) Email kate.obrien@aecom.com
- EDI Format - ENMRG (ENMRG) Email kate.obrien@aecom.com
- EDI Format - ESDAT (ESDAT) Email kate.obrien@aecom.com
- EDI Format - HLAPro (HLAPro) Email kate.obrien@aecom.com
- EDI Format - XTab (XTAB) Email kate.obrien@aecom.com

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

QUALITY CONTROL REPORT

Work Order	: **ES1110584**	Page	: 1 of 10
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo HHERA 60153531 1S4150086 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Barangaroo		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Order number	: ----		
		No. of samples received	: 27
Quote number	: SY/418/10 V2	No. of samples analysed	: 27

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
WORLD RECOGNISED ACCREDITATION

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Edwandy Fadjar	Senior Organic Chemist	Sydney Organics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Wisam.Marassa	Metals Coordinator	Sydney Inorganics

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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035F: Dissolved Mercury by FIMS (QC Lot: 1801104)									
ES1110580-003	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
ES1110584-010	IT05S Filtrate	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG050F: Dissolved Hexavalent Chromium (QC Lot: 1800275)									
ES1110584-001	IT04S Unfiltered	EG050G-F: Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	0.0	No Limit
ES1110584-010	IT05S Filtrate	EG050G-F: Hexavalent Chromium	18540-29-9	0.010	mg/L	<0.010	<0.010	0.0	No Limit
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QC Lot: 1803315)									
ES1110584-009	IT04D Filtrate	EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	45.2	44.8	0.7	0% - 20%
		EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	0.5	0.7	30.7	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	33.1	33.6	1.4	0% - 20%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	0.8	<0.5	47.6	No Limit
		EG093A-F: Copper	7440-50-8	1	µg/L	6	6	0.0	No Limit
		EG093A-F: Zinc	7440-66-6	5	µg/L	66	68	3.0	0% - 50%
ES1110580-001	Anonymous	EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG093A-F: Cobalt	7440-48-4	0.2	µg/L	0.7	0.7	0.0	No Limit
		EG093A-F: Lead	7439-92-1	0.2	µg/L	0.8	0.9	17.2	No Limit
		EG093A-F: Arsenic	7440-38-2	0.5	µg/L	0.6	1.1	60.4	No Limit
		EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	<0.5	0.0	No Limit
		EG093A-F: Nickel	7440-02-0	0.5	µg/L	9.1	9.9	8.4	0% - 50%
		EG093A-F: Vanadium	7440-62-2	0.5	µg/L	1.2	1.2	0.0	No Limit
		EG093A-F: Copper	7440-50-8	1	µg/L	30	30	0.0	0% - 20%
		EG093A-F: Zinc	7440-66-6	5	µg/L	18	18	0.0	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1809516)									
EB1109933-001	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.2	0.2	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	<0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.4	1.5	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.8	0.8	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	0.9	1.0	0.0	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	2.0	2.0	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	5	0.0	No Limit
EB1109933-012	Anonymous	EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	<0.05	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 (%)
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 1809516) - continued									
EB1109933-012	Anonymous	EG094A-F: Cobalt	7440-48-4	0.1	µg/L	0.5	0.6	0.0	No Limit
		EG094A-F: Lead	7439-92-1	0.1	µg/L	0.2	0.1	0.0	No Limit
		EG094A-F: Arsenic	7440-38-2	0.2	µg/L	1.4	1.4	0.0	No Limit
		EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	<0.2	0.0	No Limit
		EG094A-F: Vanadium	7440-62-2	0.2	µg/L	0.6	0.6	0.0	No Limit
		EG094A-F: Copper	7440-50-8	0.5	µg/L	0.8	0.7	0.0	No Limit
		EG094A-F: Nickel	7440-02-0	0.5	µg/L	4.0	3.9	0.0	No Limit
		EG094A-F: Zinc	7440-66-6	1	µg/L	4	4	0.0	No Limit
EK025G: Free cyanide by Discrete Analyser (QC Lot: 1801015)									
ES1110580-001	Anonymous	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1110584-007	IT04S FIltrate	EK025G: Free Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QC Lot: 1801014)									
ES1110580-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
ES1110584-007	IT04S FIltrate	EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	<0.004	0.0	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1801025)									
ES1110414-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	113	114	1.5	0% - 20%
ES1110584-008	IT04M FIltrate	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	1.15	1.35	16.0	0% - 20%
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 1807135)									
ES1110584-007	IT04S FIltrate	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
ES1110728-002	Anonymous	EP074: Styrene	100-42-5	5	µg/L	<5	<5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1807136)									
ES1110584-007	IT04S FIltrate	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 1807136)									
ES1110584-007	IT04S FIltrate	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 1807136)									
ES1110584-007	IT04S FIltrate	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<5	<5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control 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
EP075H: Anilines and Benzidines (QCLot: 1800504)								
EP075: Dibenzofuran	132-64-9	0.5	mg/kg	<0.5	1.25 mg/kg	91.1	60.2	111
EP132A: Phenolic Compounds (QCLot: 1800501)								
EP132: 2-Chlorophenol	95-57-8	10	µg/kg	<10	100 µg/kg	89.9	56.2	115
EP132: 4-Chloro-3-Methylphenol	59-50-7	10	µg/kg	<10	100 µg/kg	100	60.1	121
EP132: m-Cresol	108-39-4	10	µg/kg	<10	100 µg/kg	# 129	44.7	119
EP132: o-Cresol	95-48-7	10	µg/kg	<10	100 µg/kg	# 110	32.6	98
EP132: p-Cresol	106-44-5	10	µg/kg	<10	100 µg/kg	# 121	39.1	99.9
EP132: 2.4-Dichlorophenol	120-83-2	10	µg/kg	<10	100 µg/kg	91.0	38.1	115
EP132: 2.6-Dichlorophenol	87-65-0	10	µg/kg	<10	100 µg/kg	95.8	52.1	116
EP132: 2.4-Dimethylphenol	105-67-9	10	µg/kg	<10	100 µg/kg	47.4	19.7	83.1
EP132: Hexachlorophene	70-30-4	10	µg/kg	<10	100 µg/kg	78.4	9.02	80
EP132: 2-Nitrophenol	88-75-5	10	µg/kg	<10	100 µg/kg	68.8	26.8	121
EP132: 4-Nitrophenol	100-02-7	10	µg/kg	<10	100 µg/kg	91.3	36.1	116
EP132: Pentachlorophenol	87-86-5	10	µg/kg	<10	100 µg/kg	# 85.8	32.4	81.6
EP132: Phenol	108-95-2	10	µg/kg	<10	100 µg/kg	70.6	48.2	129
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	10	µg/kg	<10	100 µg/kg	88.0	30.4	92.8
EP132: 2.4.5-Trichlorophenol	95-95-4	10	µg/kg	<10	100 µg/kg	96.5	47.3	111
EP132: 2.4.6-Trichlorophenol	88-06-2	10	µg/kg	<10	100 µg/kg	80.4	31.2	107
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800501)								
EP132: 3-Methylcholanthrene	56-49-5	10	µg/kg	<10	100 µg/kg	60.5	34.8	123
EP132: 2-Methylnaphthalene	91-57-6	10	µg/kg	<10	100 µg/kg	111	66.6	122
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	10	µg/kg	<10	100 µg/kg	101	6.88	147
EP132: Acenaphthene	83-32-9	10	µg/kg	<10	100 µg/kg	106	62.9	124
EP132: Acenaphthylene	208-96-8	10	µg/kg	<10	100 µg/kg	92.1	58.2	117
EP132: Anthracene	120-12-7	10	µg/kg	<10	100 µg/kg	103	61.4	117
EP132: Benz(a)anthracene	56-55-3	10	µg/kg	<10	100 µg/kg	113	65.7	125
EP132: Benzo(a)pyrene	50-32-8	10	µg/kg	<10	100 µg/kg	98.6	60.7	119
EP132: Benzo(b)fluoranthene	205-99-2	10	µg/kg	<10	100 µg/kg	108	68.6	126
EP132: Benzo(e)pyrene	192-97-2	10	µg/kg	<10	100 µg/kg	105	70	129
EP132: Benzo(g.h.i)perylene	191-24-2	10	µg/kg	<10	100 µg/kg	108	52.4	135
EP132: Benzo(k)fluoranthene	207-08-9	10	µg/kg	<10	100 µg/kg	88.1	70.4	126
EP132: Chrysene	218-01-9	10	µg/kg	<10	100 µg/kg	110	67.5	126
EP132: Coronene	191-07-1	10	µg/kg	<10	100 µg/kg	91.2	34.7	141
EP132: Dibenz(a.h)anthracene	53-70-3	10	µg/kg	<10	100 µg/kg	112	61.7	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800501) - continued								
EP132: Fluoranthene	206-44-0	10	µg/kg	<10	100 µg/kg	113	68.7	126
EP132: Fluorene	86-73-7	10	µg/kg	<10	100 µg/kg	108	66.7	123
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	10	µg/kg	<10	100 µg/kg	110	56.6	131
EP132: N-2-Fluorenyl Acetamide	53-96-3	100	µg/kg	<100	100 µg/kg	107	50	138
EP132: Naphthalene	91-20-3	10	µg/kg	<10	100 µg/kg	99.4	63.2	120
EP132: Perylene	198-55-0	10	µg/kg	<10	100 µg/kg	82.3	58.6	119
EP132: Phenanthrene	85-01-8	10	µg/kg	<10	100 µg/kg	114	65.4	124
EP132: Pyrene	129-00-0	10	µg/kg	<10	100 µg/kg	116	67.9	127

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 1801104)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	109	86	116
EG050F: Dissolved Hexavalent Chromium (QCLot: 1800275)								
EG050G-F: Hexavalent Chromium	18540-29-9	0.01	mg/L	<0.010	0.50 mg/L	104	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1803315)								
EG093A-F: Arsenic	7440-38-2	0.5	µg/L	<0.5	10 µg/L	116	85	125
EG093A-F: Cadmium	7440-43-9	0.2	µg/L	<0.2	10 µg/L	91.9	78	116
EG093A-F: Chromium	7440-47-3	0.5	µg/L	<0.5	10 µg/L	107	86	128
EG093A-F: Cobalt	7440-48-4	0.2	µg/L	<0.2	10 µg/L	96.6	87	127
EG093A-F: Copper	7440-50-8	1	µg/L	<1	10 µg/L	93.6	86	124
EG093A-F: Lead	7439-92-1	0.2	µg/L	<0.2	10 µg/L	101	87	123
EG093A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	105	84	124
EG093A-F: Vanadium	7440-62-2	0.5	µg/L	<0.5	10 µg/L	97.2	85	123
EG093A-F: Zinc	7440-66-6	5	µg/L	<5	10 µg/L	106	82	128
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809516)								
EG094A-F: Arsenic	7440-38-2	0.2	µg/L	# 0.6	10 µg/L	99.6	86	124
EG094A-F: Cadmium	7440-43-9	0.05	µg/L	<0.05	10 µg/L	91.3	80	112
EG094A-F: Chromium	7440-47-3	0.2	µg/L	<0.2	10 µg/L	98.7	83	121
EG094A-F: Cobalt	7440-48-4	0.1	µg/L	<0.1	10 µg/L	108	88	122
EG094A-F: Copper	7440-50-8	0.5	µg/L	<0.5	10 µg/L	107	88	122
EG094A-F: Lead	7439-92-1	0.1	µg/L	<0.1	10 µg/L	104	82	120
EG094A-F: Nickel	7440-02-0	0.5	µg/L	<0.5	10 µg/L	99.4	86	122
EG094A-F: Vanadium	7440-62-2	0.2	µg/L	<0.2	10 µg/L	# 80.8	83	117
EG094A-F: Zinc	7440-66-6	1	µg/L	<1	10 µg/L	107	79	133
EK025G: Free cyanide by Discrete Analyser (QCLot: 1801015)								
EK025G: Free Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	107	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1801014)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1801014) - continued								
EK028G: Weak Acid Dissociable Cyanide	----	0.004	mg/L	<0.004	0.2 mg/L	107	70	129
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1801025)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	95.7	79.6	122
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 1807135)								
EP074: Styrene	100-42-5	5	µg/L	<5	10 µg/L	82.9	75	119
EP075H: Anilines and Benzidines (QCLot: 1800593)								
EP075: Dibenzofuran	132-64-9	2	µg/L	<2	5 µg/L	71.9	65.3	108
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1800594)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	98.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	124	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	116	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1807136)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	97.3	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1800594)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	80.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	120	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	300 µg/L	126	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1807136)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	90.6	75	127
EP080: BTEXN (QCLot: 1807136)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	100	70	124
EP080: Toluene	108-88-3	2	µg/L	----	10 µg/L	96.2	74.4	124
		5	µg/L	<5	----	----	----	----
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	87.8	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	84.9	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	89.1	73	121
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	87.0	72.9	127
EP132A: Phenolic Compounds (QCLot: 1800601)								
EP132: 2-Chlorophenol	95-57-8	0.05	µg/L	<0.05	2 µg/L	# 123	74.2	119
EP132: 4-Chloro-3-Methylphenol	59-50-7	0.05	µg/L	<0.05	2 µg/L	97.6	70.1	115
EP132: m-Cresol	108-39-4	0.10	µg/L	<0.1	2 µg/L	84.2	45.3	93.3
EP132: o-Cresol	95-48-7	0.10	µg/L	<0.1	2 µg/L	94.8	46	103
EP132: p-Cresol	106-44-5	0.10	µg/L	<0.1	2 µg/L	83.0	43.6	102
EP132: 2.4-Dichlorophenol	120-83-2	0.10	µg/L	<0.1	2 µg/L	101	70.2	117
EP132: 2.6-Dichlorophenol	87-65-0	0.10	µg/L	<0.1	2 µg/L	99.7	69.8	115
EP132: 2.4-Dimethylphenol	105-67-9	0.10	µg/L	<0.1	2 µg/L	107	40	128

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
EP132A: Phenolic Compounds (QCLot: 1800601) - continued								
EP132: Hexachlorophene	70-30-4	0.10	µg/L	<0.1	2 µg/L	84.6	24.4	102
EP132: 2-Nitrophenol	88-75-5	0.10	µg/L	<0.1	2 µg/L	79.5	49.7	112
EP132: 4-Nitrophenol	100-02-7	0.10	µg/L	<0.1	2 µg/L	74.2	32.8	109
EP132: Pentachlorophenol	87-86-5	0.05	µg/L	<0.05	2 µg/L	# 97.3	32.6	89.4
EP132: Phenol	108-95-2	0.10	µg/L	<0.1	2 µg/L	# 61.6	26.5	58.7
EP132: 2.3.4.6-Tetrachlorophenol	58-90-2	0.10	µg/L	<0.1	2 µg/L	99.8	34.4	108
EP132: 2.4.5-Trichlorophenol	95-95-4	0.10	µg/L	<0.1	2 µg/L	101	56.4	117
EP132: 2.4.6-Trichlorophenol	88-06-2	0.10	µg/L	<0.1	2 µg/L	83.2	56.8	117
EP132B: Polynuclear Aromatic Hydrocarbons (QCLot: 1800601)								
EP132: 3-Methylcholanthrene	56-49-5	0.10	µg/L	<0.1	2 µg/L	102	65.8	121
EP132: 2-Methylnaphthalene	91-57-6	0.10	µg/L	<0.1	2 µg/L	97.2	67.7	112
EP132: 7.12-Dimethylbenz(a)anthracene	57-97-6	0.10	µg/L	<0.1	2 µg/L	104	11.6	146
EP132: Acenaphthene	83-32-9	0.10	µg/L	<0.1	2 µg/L	99.6	73.2	111
EP132: Acenaphthylene	208-96-8	0.10	µg/L	<0.1	2 µg/L	104	72.4	112
EP132: Anthracene	120-12-7	0.10	µg/L	<0.1	2 µg/L	111	73.4	113
EP132: Benz(a)anthracene	56-55-3	0.10	µg/L	<0.1	2 µg/L	110	73.6	114
EP132: Benzo(a)pyrene	50-32-8	0.05	µg/L	<0.05	2 µg/L	111	75.2	117
EP132: Benzo(b)fluoranthene	205-99-2	0.10	µg/L	<0.1	2 µg/L	102	71.4	119
EP132: Benzo(e)pyrene	192-97-2	0.10	µg/L	<0.1	2 µg/L	95.8	75.3	118
EP132: Benzo(g.h.i)perylene	191-24-2	0.10	µg/L	<0.1	2 µg/L	83.0	66.6	121
EP132: Benzo(k)fluoranthene	207-08-9	0.10	µg/L	<0.1	2 µg/L	82.8	74.8	118
EP132: Chrysene	218-01-9	0.10	µg/L	<0.1	2 µg/L	104	69.6	120
EP132: Coronene	191-07-1	0.10	µg/L	<0.1	2 µg/L	92.0	47.4	131
EP132: Dibenz(a.h)anthracene	53-70-3	0.10	µg/L	<0.1	2 µg/L	93.4	71.5	117
EP132: Fluoranthene	206-44-0	0.10	µg/L	<0.1	2 µg/L	105	74.8	117
EP132: Fluorene	86-73-7	0.10	µg/L	<0.1	2 µg/L	102	72.9	114
EP132: Indeno(1.2.3.cd)pyrene	193-39-5	0.10	µg/L	<0.1	2 µg/L	90.9	67.8	119
EP132: N-2-Fluorenyl Acetamide	53-96-3	0.10	µg/L	<0.1	20 µg/L	76.0	53.6	131
EP132: Naphthalene	91-20-3	0.10	µg/L	<0.1	2 µg/L	104	68.3	116
EP132: Perylene	198-55-0	0.10	µg/L	<0.1	2 µg/L	113	68	122
EP132: Phenanthrene	85-01-8	0.10	µg/L	<0.1	2 µg/L	103	74.8	112
EP132: Pyrene	129-00-0	0.10	µg/L	<0.1	2 µg/L	105	75.1	117

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035F: Dissolved Mercury by FIMS (QCLot: 1801104)							
ES1110580-004	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	90.0	70	130
EG050F: Dissolved Hexavalent Chromium (QCLot: 1800275)							
ES1110584-001	IT04S Unfiltered	EG050G-F: Hexavalent Chromium	18540-29-9	0.50 mg/L	112	70	130
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS (QCLot: 1803315)							
ES1110580-001	Anonymous	EG093A-F: Arsenic	7440-38-2	50 µg/L	108	70	130
		EG093A-F: Cadmium	7440-43-9	12.5 µg/L	85.9	70	130
		EG093A-F: Chromium	7440-47-3	50 µg/L	96.8	70	130
		EG093A-F: Cobalt	7440-48-4	50 µg/L	93.2	70	130
		EG093A-F: Copper	7440-50-8	50 µg/L	84.5	70	130
		EG093A-F: Lead	7439-92-1	50 µg/L	97.0	70	130
		EG093A-F: Nickel	7440-02-0	50 µg/L	88.8	70	130
		EG093A-F: Vanadium	7440-62-2	50 µg/L	86.0	70	130
		EG093A-F: Zinc	7440-66-6	50 µg/L	81.9	70	130
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 1809516)							
EB1109933-001	Anonymous	EG094A-F: Arsenic	7440-38-2	50 µg/L	124	70	130
		EG094A-F: Cadmium	7440-43-9	12.5 µg/L	92.7	70	130
		EG094A-F: Chromium	7440-47-3	50 µg/L	99.0	70	130
		EG094A-F: Cobalt	7440-48-4	50 µg/L	124	70	130
		EG094A-F: Copper	7440-50-8	50 µg/L	102	70	130
		EG094A-F: Lead	7439-92-1	50 µg/L	87.1	70	130
		EG094A-F: Nickel	7440-02-0	50 µg/L	105	70	130
		EG094A-F: Vanadium	7440-62-2	50 µg/L	108	70	130
		EG094A-F: Zinc	7440-66-6	50 µg/L	103	70	130
EK025G: Free cyanide by Discrete Analyser (QCLot: 1801015)							
ES1110580-001	Anonymous	EK025G: Free Cyanide	----	0.2 mg/L	81.0	70	130
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser (QCLot: 1801014)							
ES1110580-001	Anonymous	EK028G: Weak Acid Dissociable Cyanide	----	0.2 mg/L	# 59.4	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1801025)							
ES1110414-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	# Not Determined	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1807136)							
ES1110584-007	IT04S Filtrate	EP080: C6 - C9 Fraction	----	325 µg/L	125	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 1807136)							
ES1110584-007	IT04S Filtrate	EP080: C6 - C10 Fraction	----	375 µg/L	118	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*
EP080: BTEXN (QCLot: 1807136)							
ES1110584-007	IT04S FIltrate	EP080: Benzene	71-43-2	25 µg/L	105	70	130
		EP080: Toluene	108-88-3	25 µg/L	105	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	97.6	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	99.0	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	101	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	72.1	70	130

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1110584**	Page	: 1 of 21
Client	: AECOM Australia Pty Ltd	Laboratory	: Environmental Division Sydney
Contact	: MS KATE MCGRATH	Contact	: Jennifer Cullen
Address	: PO Box Q410 QVB Post Office Sydney NSW, AUSTRALIA 1230	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kate.obrien@aecom.com	E-mail	: jennifer.cullen@alsglobal.com
Telephone	: +61 02 8484 8999	Telephone	: +61 2 8784 8509
Facsimile	: +61 02 8484 8989	Facsimile	: +61 2 8784 8500
Project	: Barangaroo HHERA 60153531 1S4150086 1	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: Barangaroo		
C-O-C number	: ----	Date Samples Received	: 19-MAY-2011
Sampler	: DS	Issue Date	: 31-MAY-2011
Order number	: ----		
		No. of samples received	: 27
Quote number	: SY/418/10 V2	No. of samples analysed	: 27

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								
Personal Filter								
IT04S - FP1,	IT04M - FP1,	**20-MAY-2011**	**----**	----	----	**25-MAY-2011**	03-JUN-2011	✓
IT04D - FP1,	IT05S - FP1,							
IT05M - FP1,	IT05D - FP1,							
Filter Paper Blank - FP1,	IT04S - FP2,							
IT04M - FP2,	IT04D - FP2,							
IT05S - FP2,	IT05M - FP2,							
IT05D - FP2,	Filter Paper Blank - FP2							
EP075H: Anilines and Benzidines								
Personal Filter								
IT04S - FP1,	IT04M - FP1,	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**26-MAY-2011**	02-JUL-2011	✓
IT04D - FP1,	IT05S - FP1,							
IT05M - FP1,	IT05D - FP1,							
Filter Paper Blank - FP1,	IT04S - FP2,							
IT04M - FP2,	IT04D - FP2,							
IT05S - FP2,	IT05M - FP2,							
IT05D - FP2,	Filter Paper Blank - FP2							
EP132A: Phenolic Compounds								
Personal Filter								
IT04S - FP1,	IT04M - FP1,	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**26-MAY-2011**	02-JUL-2011	✓
IT04D - FP1,	IT05S - FP1,							
IT05M - FP1,	IT05D - FP1,							
Filter Paper Blank - FP1,	IT04S - FP2,							
IT04M - FP2,	IT04D - FP2,							
IT05S - FP2,	IT05M - FP2,							
IT05D - FP2,	Filter Paper Blank - FP2							

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
EP132B: Polynuclear Aromatic Hydrocarbons							
Personal Filter IT04S - FP1, IT04M - FP1, IT04D - FP1, IT05S - FP1, IT05M - FP1, IT05D - FP1, Filter Paper Blank - FP1, IT04S - FP2, IT04M - FP2, IT04D - FP2, IT05S - FP2, IT05M - FP2, IT05D - FP2, Filter Paper Blank - FP2	**20-MAY-2011**	**23-MAY-2011**	03-JUN-2011	✓	**26-MAY-2011**	02-JUL-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
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**---**	16-JUN-2011	----	**26-MAY-2011**	16-JUN-2011	✓
EG050F: Dissolved Hexavalent Chromium							
Clear Plastic Bottle - NaOH IT04S - Unfiltered, IT04M - Unfiltered, IT04D - Unfiltered, IT05S - Unfiltered, IT05M - Unfiltered, IT05D - Unfiltered, IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**----**	----	----	**23-MAY-2011**	16-JUN-2011	✓
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate	**19-MAY-2011**	**25-MAY-2011**	15-NOV-2011	✓	**25-MAY-2011**	15-NOV-2011	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - UHP Nitric Acid; Filtered Flitrate Blank	**19-MAY-2011**	**30-MAY-2011**	15-NOV-2011	✓	**30-MAY-2011**	15-NOV-2011	✓
EK025G: Free cyanide by Discrete Analyser							
White Plastic Bottle-NaOH IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**25-MAY-2011**	02-JUN-2011	✓	**25-MAY-2011**	02-JUN-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
EK028G: Weak Acid Dissociable Cyanide By Discrete Analyser							
White Plastic Bottle-NaOH							
IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	02-JUN-2011	✓	**24-MAY-2011**	02-JUN-2011	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid							
IT04S - Unfiltered, IT04M - Unfiltered, IT04D - Unfiltered, IT05S - Unfiltered, IT05M - Unfiltered, IT05D - Unfiltered, IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**---**	16-JUN-2011	----	**24-MAY-2011**	16-JUN-2011	✓
EP074A: Monocyclic Aromatic Hydrocarbons							
Amber VOC Vial - HCl							
IT04S - Unfiltered, IT04M - Unfiltered, IT04D - Unfiltered, IT05S - Unfiltered, IT05M - Unfiltered, IT05D - Unfiltered, IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**27-MAY-2011**	02-JUN-2011	✓	**27-MAY-2011**	02-JUN-2011	✓
EP075H: Anilines and Benzidines							
Amber Glass Bottle - Unpreserved							
IT04S - Unfiltered, IT04M - Unfiltered, IT04D - Unfiltered, IT05S - Unfiltered, IT05M - Unfiltered, IT05D - Unfiltered, IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-2011	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved							
IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-2011	✓
Amber VOC Vial - HCl							
IT04S - Filtrate, IT04M - Filtrate, IT04D - Filtrate, IT05S - Filtrate, IT05M - Filtrate, IT05D - Filtrate, Flitrate Blank	**19-MAY-2011**	**27-MAY-2011**	02-JUN-2011	✓	**27-MAY-2011**	02-JUN-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 Recoverable Hydrocarbons - NEPM 2010 Draft							
Amber Glass Bottle - Unpreserved							
IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-2011	✓
Amber VOC Vial - HCl							
IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**27-MAY-2011**	02-JUN-2011	✓	**27-MAY-2011**	02-JUN-2011	✓
EP080: BTEXN							
Amber VOC Vial - HCl							
IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**27-MAY-2011**	02-JUN-2011	✓	**27-MAY-2011**	02-JUN-2011	✓
EP132A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved							
IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-2011	✓
EP132B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved							
IT04S - FIltrate, IT04M - FIltrate, IT04D - FIltrate, IT05S - FIltrate, IT05M - FIltrate, IT05D - FIltrate, Flitrate Blank	**19-MAY-2011**	**24-MAY-2011**	26-MAY-2011	✓	**25-MAY-2011**	03-JUL-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 Control Samples (LCS)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	17	**11.8**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	2	14	**14.3**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	2	16	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	2	13	**15.4**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	2	20	**10.0**	**10.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.9**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	1	16	**6.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Semivolatile Organic Compounds	EP075	1	13	**7.7**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	7	**14.3**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	1	20	**5.0**	**5.0**	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	17	**5.9**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	1	14	**7.1**	**5.0**	✓	ALS QCS3 requirement
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	1	16	**6.3**	**5.0**	✓	ALS QCS3 requirement
Free CN by Discrete Analyser	EK025G	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	1	13	**7.7**	**5.0**	✓	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	8	**12.5**	**5.0**	✓	ALS QCS3 requirement
Volatile Organic Compounds	EP074	1	20	**5.0**	**5.0**	✓	ALS QCS3 requirement
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	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).
Semivolatile Organic Compounds	EP075	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 502)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	SOIL	8270 GCMS Capiliary column, SIM mode.
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.
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)
Trivalent Chromium - Dissolved	EG049G-F	WATER	APHA 21st ed., 3500 Cr-B & 3120/3125 Trivalent Chromium is the difference between total dissolved and dissolved hexavalent chromium.
Hexavalent Chromium by Discrete Analyser - Dissolved	EG050G-F	WATER	APHA 21st ed., 3500 Cr-A & B. Samples are 0.45 um filtered prior to analysis. Hexavalent chromium is determined directly on water sample by Descrete Analyser as received by pH adjustment and colour development using dephenylcarbazide. Each run of samples is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Saline Water -Suite A by ORC-ICPMS	EG093A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals in Fresh Water -Suite A by ORC-ICPMS	EG094A-F	WATER	APHA 21st ed., 3125; USEPA SW846 - 6020 Samples are 0.45 um filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Free CN by Discrete Analyser	EK025G	WATER	APHA 21st ed., 4500-CN-C&N Free Cyanide is determined on samples after distillation using a pyridine- barbituric acid colouring reagent followed with an Discrete Analyser finish. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide By Discrete Analyser	EK028G	WATER	APHA 21st ed., 4500-CN-C&N WAD Cyanide is determined from aqueous solutions after distillation with acetic acid. The resultant distillate is then captured in a caustic absorber solution followed by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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)
Volatile Organic Compounds	EP074	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Organic Compounds	EP075	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (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. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Semivolatile Compounds by GCMS(SIM - Ultra-trace)	EP132	WATER	USEPA 3640 (GPC Cleanup), 8270 GCMS Capiliary column, SIM mode. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Preparation Methods	Method	Matrix	Method Descriptions
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids/ Acetylation	ORG17A-AC	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to 1 mL with exchange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace analysis.
Free Cyanide	EK025-PR	WATER	APHA 21st ed., 4500 CN- C&N. The sample is distilled at natural pH. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Weak Acid Dissociable Cyanide	EK028-PR	WATER	APHA 21st ed., 4500 CN- I&N. The sample is distilled with Acetic acid, selectively releasing the weakly bound metal cyanides as HCN. The CN is trapped in a caustic solution, and quanitified by colourimetry on FIA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
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.
Sep. Funnel Extraction /Acetylation of Phenolic Compounds	ORG14-AC	WATER	USEPA 3510 (Extraction)/ In-house (Acetylation): A 1L sample is extracted into dichloromethane and concentrated to 1 mL with echange into cyclohexane. Phenolic compounds are reacted with acetic anhydride to yield phenyl acetates suitable for ultra-trace 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 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							
EP132A: Phenolic Compounds	2118909-002	----	**m-Cresol**	108-39-4	129 %	44.7-119%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2118909-002	----	**o-Cresol**	95-48-7	110 %	32.6-98%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2118909-002	----	**p-Cresol**	106-44-5	121 %	39.1-99.9%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2118909-002	----	**Pentachlorophenol**	87-86-5	85.8 %	32.4-81.6%	**Recovery greater than upper control limit**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Method Blank (MB) Values							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2130248-002	----	**Arsenic**	7440-38-2	0.6 µg/L	0.2 µg/L	**Blank result exceeds permitted value**
Laboratory Control Spike (LCS) Recoveries							
EG094F: Dissolved Metals in Fresh Water by ORC-ICPI	2130248-003	----	**Vanadium**	7440-62-2	80.8 %	83-117%	**Recovery less than lower control limit**
EP132A: Phenolic Compounds	2119027-002	----	**2-Chlorophenol**	95-57-8	123 %	74.2-119%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2119027-002	----	**Pentachlorophenol**	87-86-5	97.3 %	32.6-89.4%	**Recovery greater than upper control limit**
EP132A: Phenolic Compounds	2119027-002	----	**Phenol**	108-95-2	61.6 %	26.5-58.7%	**Recovery greater than upper control limit**
Matrix Spike (MS) Recoveries							
EK028G: Weak Acid Dissociable Cyanide By Discrete A	ES1110580-001	Anonymous	**Weak Acid Dissociable Cyanide**	----	59.4 %	70-130%	**Recovery less than lower data quality objective**
EK055G: Ammonia as N by Discrete Analyser	ES1110414-001	Anonymous	**Ammonia as N**	7664-41-7	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

- **For all matrices, no Duplicate outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**Nitrobenzene-D5**	4165-60-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**1.2-Dichlorobenzene-D4**	2199-69-1	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP075T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP075T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Fluorophenol**	367-12-4	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**Phenol-d6**	13127-88-3	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Chlorophenol-D4**	93951-73-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-016	IT04D FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-018	IT05M FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-022	IT04M FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-024	IT05S FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-026	IT05D FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-015	IT04M FP1	**2.4.6-Tribromophenol**	118-79-6	14.1 %	19-122 %	**Recovery less than lower data quality objective**
EP132S: Acid Extractable Surrogates	ES1110584-017	IT05S FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-019	IT05D FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-021	IT04S FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-023	IT04D FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-025	IT05M FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132S: Acid Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132S: Acid Extractable Surrogates	ES1110584-014	IT04S FP1	**2.4.6-Tribromophenol**	118-79-6	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**2-Fluorobiphenyl**	321-60-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **FILTER PAPER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted - Continued							
EP132T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**Anthracene-d10**	1719-06-8	160 %	27-133 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**Anthracene-d10**	1719-06-8	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-016	IT04D FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-018	IT05M FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-020	Filter Paper Blank FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-022	IT04M FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-024	IT05S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-026	IT05D FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-015	IT04M FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-017	IT05S FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-019	IT05D FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-021	IT04S FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-023	IT04D FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-025	IT05M FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-027	Filter Paper Blank FP2	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-014	IT04S FP1	**4-Terphenyl-d14**	1718-51-0	Not Determined	----	**Surrogate recovery not determined due to (target or non-target) matrix interferences**

Sub-Matrix: **WATER**

Sub-Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP074S: VOC Surrogates	ES1110584-011	IT05M FIltrate	**4-Bromofluorobenzene**	460-00-4	80.3 %	80.8-123.7 %	**Recovery less than lower data quality objective**
EP074S: VOC Surrogates	ES1110584-008	IT04M FIltrate	**4-Bromofluorobenzene**	460-00-4	80.1 %	80.8-123.7 %	**Recovery less than lower data quality objective**
EP075S: Acid Extractable Surrogates	ES1110584-011	IT05M FIltrate	**2-Fluorophenol**	367-12-4	132 %	10.0-116.6 %	**Recovery greater than upper data quality objective**
EP075S: Acid Extractable Surrogates	ES1110584-012	IT05D FIltrate	**2-Fluorophenol**	367-12-4	117 %	10.0-116.6 %	**Recovery greater than upper data quality objective**
EP132T: Base/Neutral Extractable Surrogates	ES1110584-009	IT04D FIltrate	**2-Fluorobiphenyl**	321-60-8	117 %	43-116 %	**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.**

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Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Anthony Davis

NATA
WORLD RECOGNISED ACCREDITATION

NATA Accredited
Laboratory Number 13535

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
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Report	290188-S
Client Reference	BARANGAROO VMP DGI 60153531/6.1
Received Date	Feb 11, 2011

Client Sample ID			**QC603**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**11-FE30884**
Date Sampled			**Feb 08, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	10	mg/kg	73
TRH C10-C14 Fraction by GC	50	mg/kg	940
TRH C15-C28 Fraction by GC	100	mg/kg	2500
TRH C29-C36 Fraction by GC	100	mg/kg	960
TRH C10-36 (Total)	100	mg/kg	4400
BTEX			
Benzene	0.5	mg/kg	11
Toluene	0.5	mg/kg	24
Ethylbenzene	0.5	mg/kg	2.4
Total m+p-Xylenes	1	mg/kg	26
o-Xylene	0.5	mg/kg	9.7
Xylenes(ortho.meta and para)	0.15	mg/kg	36
Total BTEX	1	mg/kg	73
4-Bromofluorobenzene (surr.)	1	%	81
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	0.5	mg/kg	11
Acenaphthylene	0.5	mg/kg	50
Anthracene	0.5	mg/kg	52
Benz(a)anthracene	0.5	mg/kg	43
Benzo(a)pyrene	0.5	mg/kg	33
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	46
Benzo(g.h.i)perylene	0.5	mg/kg	15
Chrysene	0.5	mg/kg	31
Dibenz(a.h)anthracene	0.5	mg/kg	3.9
Fluoranthene	0.5	mg/kg	110
Fluorene	0.5	mg/kg	62
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	14
Naphthalene	0.5	mg/kg	440
Phenanthrene	0.5	mg/kg	160
Pyrene	0.5	mg/kg	83
Total PAH	1	mg/kg	1200
Anthracene-d10 (surr.)	1	%	100
2-Fluorobiphenyl (surr.)	1	%	102
p-Terphenyl-d14 (surr.)	1	%	74
% Moisture	0.1	%	14
Heavy Metals			

Client Sample ID			QC603
Sample Matrix			Soil
mgt-LabMark Sample No.			11-FE30884
Date Sampled			Feb 08, 2011
Test/Reference	LOR	Unit	
Arsenic	2	mg/kg	< 2
Cadmium	0.5	mg/kg	< 0.5
Chromium	5	mg/kg	5.5
Copper	5	mg/kg	< 5
Lead	5	mg/kg	6.4
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	5.6
Mercury	0.1	mg/kg	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Asquith	Feb 14, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Asquith	Feb 14, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Asquith	Feb 14, 2011	14 Day
% Moisture - Method: E005 Moisture Content	Asquith	Feb 14, 2011	28 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Oakleigh	Feb 15, 2011	6 Month

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ENVIRONMENTAL LABORATORIES
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Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name:	AECOM Aust P/L Sydney	**Order No.:**		**Received:**	Feb 11, 2011 12:00
Address:	Level 5, 828 Pacific Hwy Gordon NSW 2072	**Report #:**	290188	**Due:**	Feb 18, 2011 02:34
		Phone:	(02) 8484 8999	**Priority:**	5 Day
		Fax:	(02) 8484 8989	**Contact name:**	Anthony Davis
Client Job No.:	BARANGAROO VMP DGI 60153531/6.1				

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Oakleigh Laboratory - NATA Site #1261						X	X	X	X		X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																	
Asquith Laboratory - NATA Site #13535					X					X					X	X	X
Clayton Laboratory - NATA Site #1645																	
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC651	Feb 08, 2011		Soil	A11-FE30881						X							
QC654	Feb 08, 2011		Soil	A11-FE30882						X							
QC601	Feb 08, 2011		Soil	A11-FE30883						X							
QC603	Feb 08, 2011		Soil	A11-FE30884	X	X	X	X	X		X	X	X	X	X	X	X

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mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram
mg/L: milligrams per litre
µg/l: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100ml: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units

TERMS

Dry: Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR: Limit Of Reporting.
SPIKE: Addition of the analyte to the sample and reported as percentage recovery.
RPD: Relative Percent Difference between two Duplicate pieces of analysis.
LCS: Laboratory Control Sample - reported as percent recovery.
CRM: Certified Reference Material - reported as percent recovery.
Method Blank: In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate: The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate: A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate: A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE: Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA: U.S Environmental Protection Agency
APHA: American Public Health Association
ASLP: Australian Standard Leaching Procedure (AS4439.3)
TCLP: Toxicity Characteristic Leaching Procedure
COC: Chain Of Custody
SRA: Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	101			70-130	Pass	
TRH C15-C28 Fraction by GC	%	85			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	100			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
Total m+p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	92			70-130	Pass	
Xylenes(ortho.meta and para)	%	91			70-130	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer		Result 1					
Arsenic	%	95			80-120	Pass	
Cadmium	%	99			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	106			80-120	Pass	
Lead	%	98			80-120	Pass	
Nickel	%	100			80-120	Pass	
Zinc	%	96			80-120	Pass	
Mercury	%	120			75-125	Pass	
[Duplicate of 11-FE30884]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	73	82	12	30%	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	150	150	<1	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	410	430	<1	30%	Pass	
[Duplicate of 11-FE30884]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/kg	11	11	5	30%	Pass	
Toluene	mg/kg	24	22	6	30%	Pass	
Ethylbenzene	mg/kg	2.4	2.4	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	26	26	1	30%	Pass	
o-Xylene	mg/kg	9.7	9.9	2	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	36	36	1	30%	Pass	
[Duplicate of 11-FE31401 - BATCH]							
Heavy Metals		Result 1	Result 2	RPD			
Arsenic	mg/kg	< 2	< 2	<1	30%	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Cadmium	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chromium	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	mg/kg	< 5	< 5	<1	30%	Pass	
Mercury	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
[Spike of 11-FE30884] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	81			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	110			70 - 130	Pass	
[Spike of 11-FE30884] - % Recovery							
BTEX		Result 1					
Benzene	%	85			70 - 130	Pass	
Toluene	%	85			70 - 130	Pass	
Ethylbenzene	%	80			70 - 130	Pass	
Total m+p-Xylenes	%	74			70 - 130	Pass	
o-Xylene	%	77			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	75			70 - 130	Pass	
[Spike of 11-FE31401 - BATCH] - % Recovery							
Heavy Metals		Result 1					
Arsenic	%	96			75 - 125	Pass	
Cadmium	%	102			75 - 125	Pass	
Chromium	%	100			75 - 125	Pass	
Copper	%	112			75 - 125	Pass	
Lead	%	100			75 - 125	Pass	
Nickel	%	104			75 - 125	Pass	
Zinc	%	98			75 - 125	Pass	
Mercury	%	103			70 - 130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	No
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Authorised By

Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

COC #2 LABMARK 1/1 290188

Chain of Custody

AECOM

AECOM - Sydney		**Laboratory Details**	Tel: 8784 8555
Level 5, 828 Pacific Highway	Tel: 61 2 8484 8999	Lab. Name: ALS	Fax:
	Fax: 61 2 8484 8989	Lab. Address:277 Woodpark Road, Smithfield NSW 2164	Preliminary Report by:
Gordon, NSW 2072	E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com		Final Report by:
		Contact Name:	Lab Quote No: **SY/418/10 V2**
Sampled By: Lauren Kontus/Kate O'Brien	AECOM Project No: 60153531/6.1	Project Name: Barangaroo VMP DGI	PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email : _____	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: Metals (8)	PAH	TPH/BTEX	Asbestos	H2LD	Other
11-FE30881	QC651	8/2/11		X					X		250ml					X	*
11-FE30882	QC654	11		↓					↓		150ml					X	*
11-FE30883	QC601	11		↓					↓		11					X	*
11-FE30884	QC603	11		↓					↓		11	X	X	X			*

* Please send to labmark for analysis.

Received 11/02/11 01:40 pm

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg	Comments:	Lab Report No.	Esky ID
Relinquished by: Lauren Kontus	Signed:	Relinquished by:	Signed: Date:
Recieved by:	Signed: Date:	Recieved by:	Signed: Date: 9/2/11

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BMS-PM-DV-F046 Revision: Jun 08

5-6 C 15.50

mgt LabMark ENVIRONMENTAL LABORATORIES

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA Acc # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name:	**AECOM Aust P/L Sydney**
Contact name:	Anthony Davis
Client job number:	BARANGAROO VMP DGI 60153531/6.1
COC number:	Not provided
Turn around time:	5 Day
Date received:	Feb 11, 2011
MGT lab reference:	**290188**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Metals(M8) by mgt Labmark Melbourne - results may be delayed | Asbestos not analysed unless otherwise instructed.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Anthony Davis - anthony.davis@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark
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NATA Acc # 1645

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1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name:	AECOM Aust P/L Sydney	**Order No.:**		**Received:**	Feb 11, 2011 12:00
Address:	Level 5, 828 Pacific Hwy	**Report #:**	290188	**Due:**	Feb 18, 2011 02:34
	Gordon	**Phone:**	(02) 8484 8999	**Priority:**	5 Day
	NSW 2072	**Fax:**	(02) 8484 8989	**Contact name:**	Anthony Davis
Client Job No.:	BARANGAROO VMP DGI 60153531/6.1				mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Oakleigh Laboratory - NATA Site #1261						X	X	X	X		X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																	
Asquith Laboratory - NATA Site #13535					X					X					X	X	X
Clayton Laboratory - NATA Site #1645																	
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC651	Feb 08, 2011		Soil	A11-FE30881						X							
QC654	Feb 08, 2011		Soil	A11-FE30882						X							
QC601	Feb 08, 2011		Soil	A11-FE30883						X							
QC603	Feb 08, 2011		Soil	A11-FE30884	X	X	X	X	X		X	X	X	X	X	X	X

mgt LabMark ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Anthony Davis

NATA Accredited
Laboratory Number 13535

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
This document shall not be reproduced, except in full.

Report	290235-S
Client Reference	BARANGAROO VMP DGI 60153531/6.1
Received Date	Feb 11, 2011

Client Sample ID			**QC607**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**11-FE30900**
Date Sampled			**Feb 10, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	10	mg/kg	310
TRH C10-C14 Fraction by GC	50	mg/kg	2000
TRH C15-C28 Fraction by GC	100	mg/kg	3600
TRH C29-C36 Fraction by GC	100	mg/kg	1000
TRH C10-36 (Total)	100	mg/kg	6600
BTEX			
Benzene	0.5	mg/kg	40
Toluene	0.5	mg/kg	87
Ethylbenzene	0.5	mg/kg	< 5
Total m+p-Xylenes	1	mg/kg	80
o-Xylene	0.5	mg/kg	36
Xylenes(ortho.meta and para)	0.15	mg/kg	120
Total BTEX	1	mg/kg	250
4-Bromofluorobenzene (surr.)	1	%	115
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	0.5	mg/kg	13
Acenaphthylene	0.5	mg/kg	110
Anthracene	0.5	mg/kg	84
Benz(a)anthracene	0.5	mg/kg	61
Benzo(a)pyrene	0.5	mg/kg	55
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	77
Benzo(g.h.i)perylene	0.5	mg/kg	23
Chrysene	0.5	mg/kg	48
Dibenz(a.h)anthracene	0.5	mg/kg	2.4
Fluoranthene	0.5	mg/kg	160
Fluorene	0.5	mg/kg	120
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	19
Naphthalene	0.5	mg/kg	1300
Phenanthrene	0.5	mg/kg	310
Pyrene	0.5	mg/kg	140
Total PAH	1	mg/kg	2500
Anthracene-d10 (surr.)	1	%	100
2-Fluorobiphenyl (surr.)	1	%	93
p-Terphenyl-d14 (surr.)	1	%	81
% Moisture	0.1	%	17
Heavy Metals			

Client Sample ID			**QC607**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**11-FE30900**
Date Sampled			**Feb 10, 2011**
Test/Reference	LOR	Unit	
Arsenic	2	mg/kg	< 2
Cadmium	0.5	mg/kg	< 0.5
Chromium	5	mg/kg	6.0
Copper	5	mg/kg	< 5
Lead	5	mg/kg	6.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	12
Mercury	0.1	mg/kg	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Asquith	Feb 15, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Asquith	Feb 15, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Asquith	Feb 15, 2011	14 Day
% Moisture - Method: E005 Moisture Content	Asquith	Feb 15, 2011	28 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Oakleigh	Feb 16, 2011	6 Month

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Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 290235
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Feb 11, 2011 12:00
Due: Feb 18, 2011 06:34
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Oakleigh Laboratory - NATA Site #1261						X	X	X	X		X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																	
Asquith Laboratory - NATA Site #13535					X					X					X	X	X
Clayton Laboratory - NATA Site #1645																	
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC659	Feb 09, 2011		Soil	A11-FE30897						X							
QC661	Feb 09, 2011		Soil	A11-FE30898						X							
QC605	Feb 09, 2011		Soil	A11-FE30899						X							
QC607	Feb 10, 2011		Soil	A11-FE30900	X	X	X	X	X		X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/kg	< 1			1	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	103			70-130	Pass	
TRH C15-C28 Fraction by GC	%	90			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	101			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
Total m+p-Xylenes	%	102			70-130	Pass	
o-Xylene	%	88			70-130	Pass	
Xylenes(ortho.meta and para)	%	97			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	79			70-130	Pass	
Acenaphthylene	%	74			70-130	Pass	
Anthracene	%	93			70-130	Pass	
Benz(a)anthracene	%	84			70-130	Pass	
Benzo(a)pyrene	%	98			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	98			70-130	Pass	
Benzo(g.h.i)perylene	%	83			70-130	Pass	
Chrysene	%	98			70-130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Dibenz(a.h)anthracene	%	79			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	79			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	83			70-130	Pass	
Naphthalene	%	81			70-130	Pass	
Phenanthrene	%	90			70-130	Pass	
Pyrene	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer		Result 1					
Arsenic	%	100			80-120	Pass	
Cadmium	%	100			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	103			80-120	Pass	
Nickel	%	105			80-120	Pass	
Zinc	%	109			80-120	Pass	
Mercury	%	113			75-125	Pass	
[Duplicate of 11-FE30964 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	< 10	< 10	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/kg	2000	2300	11	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	3600	4000	12	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	1000	1100	7.7	30%	Pass	
[Duplicate of 11-FE30964 - BATCH]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	< 1	< 1	<1	30%	Pass	
o-Xylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15	< 0.15	<1	30%	Pass	
[Duplicate of 11-FE30900]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/kg	13	13	1	30%	Pass	
Acenaphthylene	mg/kg	110	100	9	30%	Pass	
Anthracene	mg/kg	84	77	8	30%	Pass	
Benz(a)anthracene	mg/kg	61	54	13	30%	Pass	
Benzo(a)pyrene	mg/kg	55	51	10	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/kg	77	70	11	30%	Pass	
Benzo(g.h.i)perylene	mg/kg	23	20	12	30%	Pass	
Chrysene	mg/kg	48	43	10	30%	Pass	
Dibenz(a.h)anthracene	mg/kg	2.4	2.2	11	30%	Pass	
Fluoranthene	mg/kg	160	140	11	30%	Pass	
Fluorene	mg/kg	120	100	12	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	19	18	10	30%	Pass	
Naphthalene	mg/kg	1300	1100	13	30%	Pass	
Phenanthrene	mg/kg	310	290	10	30%	Pass	
Pyrene	mg/kg	140	120	12	30%	Pass	
[Duplicate of 11-FE31149 - BATCH]							
Heavy Metals		Result 1	Result 2	RPD			
Arsenic	mg/kg	10	13	27	30%	Pass	
Cadmium	mg/kg	0.7	1.7	80	30%	Fail	Q15
Chromium	mg/kg	17	22	23	30%	Pass	
Copper	mg/kg	41	51	25	30%	Pass	
Lead	mg/kg	20	20	1	30%	Pass	
Nickel	mg/kg	31	37	18	30%	Pass	
Zinc	mg/kg	86	110	25	30%	Pass	
Mercury	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
[Spike of 11-FE30964 - BATCH] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	83			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	110			70 - 130	Pass	
[Spike of 11-FE30964 - BATCH] - % Recovery							
BTEX		Result 1					
Benzene	%	90			70 - 130	Pass	
Toluene	%	93			70 - 130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Ethylbenzene	%	91			70 - 130	Pass	
Total m+p-Xylenes	%	82			70 - 130	Pass	
o-Xylene	%	89			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	85			70 - 130	Pass	
[Spike of 11-FE30900] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	77			70 - 130	Pass	
Acenaphthylene	%	76			70 - 130	Pass	
Anthracene	%	81			70 - 130	Pass	
Benz(a)anthracene	%	81			70 - 130	Pass	
Benzo(a)pyrene	%	102			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	99			70 - 130	Pass	
Benzo(g.h.i)perylene	%	91			70 - 130	Pass	
Chrysene	%	95			70 - 130	Pass	
Dibenz(a.h)anthracene	%	83			70 - 130	Pass	
Fluoranthene	%	106			70 - 130	Pass	
Fluorene	%	79			70 - 130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70 - 130	Pass	
Naphthalene	%	78			70 - 130	Pass	
Phenanthrene	%	110			70 - 130	Pass	
Pyrene	%	107			70 - 130	Pass	
[Spike of 11-FE31149 - BATCH] - % Recovery							
Heavy Metals		Result 1					
Arsenic	%	89			75 - 125	Pass	
Cadmium	%	89			75 - 125	Pass	
Chromium	%	85			75 - 125	Pass	
Copper	%	91			75 - 125	Pass	
Lead	%	82			75 - 125	Pass	
Nickel	%	75			75 - 125	Pass	
Zinc	%	76			75 - 125	Pass	
Mercury	%	105			70 - 130	Pass	

Comments

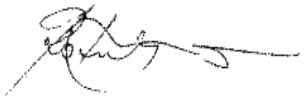
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	No
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes mgt-LabMark's Acceptance Criteria as stipulated in AS-POL-002. Refer to Glossary Page of this report for further details

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Chain of Custody

290235 COC #3 LABMARK 1/1

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/418/10 V2

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. 39540AUS

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	water	other	Preservation: filt'ed	acid	Ice	other	Container (No. & type)	Analysis Request: Metals (6)	PAH	TPH/BTEX	Asbestos	Hold	Other
11-FE30897	QC659	9.2.11		X					X		150ml					X	*
11-FE30898	QC661	↓		X					X		150ml					X	*
11-FE30899	QC605	↓		X					X		150 mL					X	*
11-FE30900	QC607	11 labelled 10/2/11		X					X		150ml	X	X	X			* **

* Please send to Labmark for Analysis

** High PID reading >1000 ppm

Received 11/2/11 04.40pm

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus / Kate O'Brien Signed: 10/2/11

Recieved by: Signed:

Printed copies of this document are uncontrolled

Page 1 of 1

Relinquished by: Signed: Date:

Recieved by: Signed: Date: 10/2/11

Lab Report No. Esky ID

BMS-PM-DV-F046 Revision: Jan 08

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA Acc # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Anthony Davis
Client job number: BARANGAROO VMP DGI 60153531/6.1
COC number: Not provided
Turn around time: 5 Day
Date received: Feb 11, 2011
MGT lab reference: **290235**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Metals by mgt Labmark Melbourne - results may be delayed..

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Anthony Davis - anthony.davis@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 9564 7055
NATA Site # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 290235
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Feb 11, 2011 12:00
Due: Feb 18, 2011 06:34
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	HOLD	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Oakleigh Laboratory - NATA Site #1261						X	X	X	X		X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																	
Asquith Laboratory - NATA Site #13535					X					X					X	X	X
Clayton Laboratory - NATA Site #1645																	
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC659	Feb 09, 2011		Soil	A11-FE30897						X							
QC661	Feb 09, 2011		Soil	A11-FE30898						X							
QC605	Feb 09, 2011		Soil	A11-FE30899						X							
QC607	Feb 10, 2011		Soil	A11-FE30900	X	X	X	X	X		X	X	X	X	X	X	X

mgt LabMark ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Anthony Davis

NATA Accredited
Laboratory Number 13535

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
This document shall not be reproduced, except in full.

Report	290645-S
Client Reference	BARANGAROO VMP DGI
Received Date	Feb 15, 2011

Client Sample ID			**QC611**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**11-FE31317**
Date Sampled			**Feb 14, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	10	mg/kg	< 10
TRH C10-C14 Fraction by GC	50	mg/kg	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	< 100
TRH C10-36 (Total)	100	mg/kg	< 100
BTEX			
Benzene	0.5	mg/kg	< 0.5
Toluene	0.5	mg/kg	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1
o-Xylene	0.5	mg/kg	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15
Total BTEX	1	mg/kg	< 1
4-Bromofluorobenzene (surr.)	1	%	103
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	< 1
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH	1	mg/kg	< 1
Anthracene-d10 (surr.)	1	%	100
2-Fluorobiphenyl (surr.)	1	%	94
p-Terphenyl-d14 (surr.)	1	%	113
% Moisture	0.1	%	21
Heavy Metals			

Client Sample ID			**QC611**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**11-FE31317**
Date Sampled			**Feb 14, 2011**
Test/Reference	LOR	Unit	
Arsenic	2	mg/kg	< 2
Cadmium	0.5	mg/kg	< 0.5
Chromium	5	mg/kg	9.7
Copper	5	mg/kg	< 5
Lead	5	mg/kg	7.7
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	< 5
Mercury	0.1	mg/kg	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Asquith	Feb 17, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Asquith	Feb 17, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Asquith	Feb 17, 2011	14 Day
% Moisture - Method: E005 Moisture Content	Asquith	Feb 17, 2011	28 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Oakleigh	Feb 21, 2011	6 Month

mgt LabMark ENVIRONMENTAL LABORATORIES

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

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3-5 Kingston Town Close
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Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 290645
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Feb 15, 2011 12:00
Due: Feb 22, 2011 04:25
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																
Oakleigh Laboratory - NATA Site #1261						X	X	X	X	X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																
Asquith Laboratory - NATA Site #13535					X									X	X	X
Clayton Laboratory - NATA Site #1645																
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
QC611	Feb 14, 2011		Soil	A11-FE31317	X	X	X	X	X	X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/kg	< 1			1	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.5			0.5	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	100			70-130	Pass	
TRH C15-C28 Fraction by GC	%	72			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	93			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
Total m+p-Xylenes	%	96			70-130	Pass	
o-Xylene	%	97			70-130	Pass	
Xylenes(ortho.meta and para)	%	96			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	87			70-130	Pass	
Acenaphthylene	%	74			70-130	Pass	
Anthracene	%	78			70-130	Pass	
Benz(a)anthracene	%	82			70-130	Pass	
Benzo(a)pyrene	%	92			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	86			70-130	Pass	
Benzo(g.h.i)perylene	%	96			70-130	Pass	
Chrysene	%	86			70-130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Dibenz(a.h)anthracene	%	97			70-130	Pass	
Fluoranthene	%	91			70-130	Pass	
Fluorene	%	89			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	83			70-130	Pass	
Naphthalene	%	76			70-130	Pass	
Phenanthrene	%	78			70-130	Pass	
Pyrene	%	77			70-130	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer		Result 1					
Arsenic	%	98			80-120	Pass	
Cadmium	%	102			80-120	Pass	
Chromium	%	106			80-120	Pass	
Copper	%	108			80-120	Pass	
Lead	%	105			80-120	Pass	
Nickel	%	105			80-120	Pass	
Zinc	%	102			80-120	Pass	
Mercury	%	112			75-125	Pass	
[Duplicate of 11-FE31403 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	< 10	< 10	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100	< 100	<1	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100	< 100	<1	30%	Pass	
[Duplicate of 11-FE31403 - BATCH]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	< 1	< 1	<1	30%	Pass	
o-Xylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15	< 0.15	<1	30%	Pass	
[Duplicate of 11-FE31333 - BATCH]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/kg	< 0.5	0.7	10	30%	Pass	
Acenaphthylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	mg/kg	< 0.5	0.6	6	30%	Pass	
Benz(a)anthracene	mg/kg	< 0.5	0.6	42	30%	Fail	Q15
Benzo(a)pyrene	mg/kg	< 0.5	0.6	6	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	mg/kg	1.3	2.1	7	30%	Pass	
Fluorene	mg/kg	< 0.5	0.7	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	mg/kg	3.5	9.1	1	30%	Pass	
Phenanthrene	mg/kg	1.2	1.9	1	30%	Pass	
Pyrene	mg/kg	0.9	1.3	3	30%	Pass	
[Duplicate of 11-FE58350 - BATCH]							
Heavy Metals		Result 1	Result 2	RPD			
Arsenic	mg/kg	2.5	2.4	5	30%	Pass	
Cadmium	mg/kg	< 0.5	< 0.5	7	30%	Pass	
Chromium	mg/kg	29	30	2	30%	Pass	
Copper	mg/kg	8.7	8.9	3	30%	Pass	
Lead	mg/kg	19	13	35	30%	Fail	Q15
Nickel	mg/kg	8.8	8.7	1	30%	Pass	
Zinc	mg/kg	10	9.3	8	30%	Pass	
Mercury	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
[Spike of 11-FE31403 - BATCH] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	79			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	110			70 - 130	Pass	
[Spike of 11-FE31403 - BATCH] - % Recovery							
BTEX		Result 1					
Benzene	%	80			70 - 130	Pass	
Toluene	%	84			70 - 130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Ethylbenzene	%	86			70 - 130	Pass	
Total m+p-Xylenes	%	85			70 - 130	Pass	
o-Xylene	%	86			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	85			70 - 130	Pass	
[Spike of 11-FE31317] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	87			70 - 130	Pass	
Acenaphthylene	%	72			70 - 130	Pass	
Anthracene	%	76			70 - 130	Pass	
Benz(a)anthracene	%	82			70 - 130	Pass	
Benzo(a)pyrene	%	86			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	83			70 - 130	Pass	
Benzo(g.h.i)perylene	%	87			70 - 130	Pass	
Chrysene	%	80			70 - 130	Pass	
Dibenz(a.h)anthracene	%	86			70 - 130	Pass	
Fluoranthene	%	86			70 - 130	Pass	
Fluorene	%	85			70 - 130	Pass	
Indeno(1.2.3-cd)pyrene	%	82			70 - 130	Pass	
Naphthalene	%	76			70 - 130	Pass	
Phenanthrene	%	74			70 - 130	Pass	
Pyrene	%	75			70 - 130	Pass	
[Spike of 11-FE31317] - % Recovery							
Heavy Metals		Result 1					
Arsenic	%	84			75 - 125	Pass	
Cadmium	%	88			75 - 125	Pass	
Chromium	%	82			75 - 125	Pass	
Copper	%	94			75 - 125	Pass	
Lead	%	79			75 - 125	Pass	
Nickel	%	79			75 - 125	Pass	
Zinc	%	87			75 - 125	Pass	
Mercury	%	109			70 - 130	Pass	

Comments

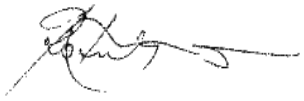
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	No
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes mgt-LabMark's Acceptance Criteria as stipulated in AS-POL-002. Refer to Glossary Page of this report for further details

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

COC #5 page 1/1 290645

Chain of Custody

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072

Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

LABMARK

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:

Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No & type)	Analysis Request: HOLD	PAH	TPH/BTEX	METALS (6)	Other
11-FE31317	QC611	14/2/11		X					X		150ml		X	X	X	
	Please send QC611 to Labmark															

Subcon / Forward Lab / Split WO
Lab / Analysis: Labmark
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach By PO / Internal Sheet:

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: Lauren Kontus / Kate O'Brien Signed: Date: 14/2/11

Recieved by: Signed: Date:

Printed copies of this document are uncontrolled
Page 1 of 1

Relinquished by: Signed: Date:

Recieved by: Wanda Signed: 1600 15/2/11

Lab Report No. Esky ID

Revision: Jan 08

BMS-PM-DV-F046

16/30

mgt LabMark ENVIRONMENTAL LABORATORIES

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Melbourne
3-5 Kingston Town Close
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Phone : +61 3 9564 7055
NATA Acc # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Anthony Davis
Client job number: BARANGAROO VMP DGI
COC number: Not provided
Turn around time: 5 Day
Date received: Feb 15, 2011
MGT lab reference: **290645**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Metals by mgt Labmark Melbourne - results may be delayed.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Anthony Davis - anthony.davis@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
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Phone : +61 3 9564 7055
NATA Site # 1261

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 290645
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Feb 15, 2011 12:00
Due: Feb 22, 2011 04:25
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																
Oakleigh Laboratory - NATA Site #1261						X	X	X	X	X	X	X	X			
Thornleigh Laboratory - NATA Site #18217																
Asquith Laboratory - NATA Site #13535					X									X	X	X
Clayton Laboratory - NATA Site #1645																
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
QC611	Feb 14, 2011		Soil	A11-FE31317	X	X	X	X	X	X	X	X	X	X	X	X

mgt LabMark
ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Anthony Davis

NATA Accredited
Laboratory Number 1645

The tests covered by this document have been performed in accordance with NATA and ISO/IES 17025 and are traceable to national standards of measurement.
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Report	292248-W
Client Reference	BARANGAROO VMP DGI 60153531/6.1
Received Date	Mar 03, 2011

Client Sample ID			**QC-616**
Sample Matrix			**Water**
mgt-LabMark Sample No.			**11-MA30474**
Date Sampled			**Feb 24, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	0.05	mg/L	0.33
TRH C10-C14 Fraction by GC	0.05	mg/L	1.0
TRH C15-C28 Fraction by GC	0.2	mg/L	1.3
TRH C29-C36 Fraction by GC	0.05	mg/L	0.22
TRH C10-36 (Total)	0.2	mg/L	2.5
Phenols (Halogenated)			
2-Chlorophenol	0.003	mg/L	< 0.003
2.4-Dichlorophenol	0.003	mg/L	< 0.003
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	< 0.03
Total Halogenated Phenol	0.01	mg/L	< 0.01
Phenols (non-Halogenated)			
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	0.060
2-Nitrophenol	0.01	mg/L	< 0.01
2.4-Dimethylphenol	0.003	mg/L	0.18
2.4-Dinitrophenol	0.03	mg/L	< 0.03
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	0.16
4-Nitrophenol	0.03	mg/L	< 0.03
Dinoseb	0.1	mg/L	< 0.1
Phenol	0.003	mg/L	< 0.05
Total Non-Halogenated Phenol	0.1	mg/L	0.4
Phenol-d6 (surr.)	1	%	45
BTEX			
Benzene	0.001	mg/L	0.14
Toluene	0.001	mg/L	0.12
Ethylbenzene	0.001	mg/L	0.004
Total m+p-Xylenes	0.002	mg/L	0.031
o-Xylene	0.001	mg/L	0.015
Xylenes(ortho.meta and para)	0.003	mg/L	0.046
Total BTEX	0.01	mg/L	0.31
4-Bromofluorobenzene (surr.)	1	%	102
Polyaromatic Hydrocarbons (PAH)			

Client Sample ID			**QC-616**
Sample Matrix			**Water**
mgt-LabMark Sample No.			**11-MA30474**
Date Sampled			**Feb 24, 2011**
Test/Reference	LOR	Unit	
Acenaphthene	0.001	mg/L	0.011
Acenaphthylene	0.001	mg/L	0.010
Anthracene	0.001	mg/L	0.002
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b)fluoranthene & Benzo(k)fluoranthene	0.002	mg/L	< 0.002
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	0.003
Fluorene	0.001	mg/L	0.011
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	0.27
Phenanthrene	0.001	mg/L	0.015
Pyrene	0.001	mg/L	0.003
Total PAH	0.002	mg/L	0.33
2-Fluorobiphenyl (surr.)	1	%	66
p-Terphenyl-d14 (surr.)	1	%	60
Cyanide (free)	0.005	mg/L	0.007
Cyanide (weak acid dissoc.)	0.01	mg/L	0.01
Heavy Metals			
Aluminium (filtered)	0.05	mg/L	< 0.05
Antimony (filtered)	0.005	mg/L	< 0.005
Arsenic (filtered)	0.001	mg/L	0.003
Barium (filtered)	0.02	mg/L	5.4
Beryllium (filtered)	0.001	mg/L	< 0.001
Cadmium (filtered)	0.0002	mg/L	0.0007
Chromium (filtered)	0.001	mg/L	< 0.001
Cobalt (filtered)	0.001	mg/L	0.001
Copper (filtered)	0.001	mg/L	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001
Manganese (filtered)	0.005	mg/L	0.31
Nickel (filtered)	0.001	mg/L	0.047
Selenium (filtered)	0.001	mg/L	0.003
Silver (filtered)	0.005	mg/L	< 0.005
Vanadium (filtered)	0.005	mg/L	< 0.005
Zinc (filtered)	0.001	mg/L	0.009
Mercury (filtered)	0.0001	mg/L	< 0.0001

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Mar 03, 2011	14 Day
Phenols (Halogenated) - Method: USEPA 8270C Phenols	Melbourne	Mar 04, 2011	7 Day
Phenols (non-Halogenated) - Method: USEPA 8270C Phenols	Melbourne	Mar 04, 2011	7 Day
BTEX - Method: E029/E016 BTEX	Sydney	Mar 03, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	Mar 04, 2011	7 Day
Cyanide (free) - Method: E040 /E054 Free Cyanide	Sydney	Mar 03, 2011	14 Day
Cyanide (weak acid dissoc.) - Method: E040 /E054 Weak Acid Dissociable Cyanide	Sydney	Mar 03, 2011	14 Day
Heavy Metals - Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury	Melbourne	Mar 04, 2011	6 Month

mgt LabMark ENVIRONMENTAL LABORATORIES

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NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 292248
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Mar 3, 2011 12:00
Due: Mar 10, 2011 08:10
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					Aluminium (filtered)	Antimony (filtered)	Arsenic (filtered)	Barium (filtered)	Beryllium (filtered)	Cadmium (filtered)	Chromium (filtered)	Cobalt (filtered)	Copper (filtered)	Cyanide (free)	Cyanide (weak acid dissoc.)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Selenium (filtered)	Silver (filtered)	Vanadium (filtered)	Zinc (filtered)	Total Recoverable Hydrocarbons	Phenols (IWRG 621)	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																											
Oakleigh Laboratory - NATA Site #1261					X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X		X		
Thornleigh Laboratory - NATA Site #18217																											
Asquith Laboratory - NATA Site #13535														X	X									X		X	X
Clayton Laboratory - NATA Site #1645																											
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																							
QC-616	Feb 24, 2011		Water	A11-MA30474	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram
mg/L:milligrams per litre
µg/l: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100ml: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units

TERMS

Dry: Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR: Limit Of Reporting.
SPIKE: Addition of the analyte to the sample and reported as percentage recovery.
RPD: Relative Percent Difference between two Duplicate pieces of analysis.
LCS: Laboratory Control Sample - reported as percent recovery.
CRM: Certified Reference Material - reported as percent recovery.
Method Blank: In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate: The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate: A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate: A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE: Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA: U.S Environmental Protection Agency
APHA: American Public Health Association
ASLP: Australian Standard Leaching Procedure (AS4439.3)
TCLP: Toxicity Characteristic Leaching Procedure
COC: Chain Of Custody
SRA: Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/L	< 0.05			0.05	Pass	
TRH C10-C14 Fraction by GC	mg/L	< 0.05			0.05	Pass	
TRH C15-C28 Fraction by GC	mg/L	< 0.2			0.2	Pass	
TRH C29-C36 Fraction by GC	mg/L	< 0.05			0.05	Pass	
Method Blank							
Phenols (Halogenated) USEPA 8270C Phenols							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated) USEPA 8270C Phenols							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Total m+p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes(ortho.meta and para)	mg/L	< 0.003			0.003	Pass	
Total BTEX	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/L	< 0.002			0.002	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Cyanide (free)	mg/L	< 0.005			0.005	Pass	
Cyanide (weak acid dissoc.)	mg/L	< 0.01			0.01	Pass	
Method Blank							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Antimony (filtered)	mg/L	< 0.005			0.005	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Barium (filtered)	mg/L	< 0.02			0.02	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Silver (filtered)	mg/L	< 0.005			0.005	Pass	
Vanadium (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	99			70-130	Pass	
TRH C15-C28 Fraction by GC	%	86			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated) USEPA 8270C Phenols		Result 1					
2-Chlorophenol	%	87			30-130	Pass	
2.4-Dichlorophenol	%	90			30-130	Pass	
2.4.5-Trichlorophenol	%	112			30-130	Pass	
2.4.6-Trichlorophenol	%	84			30-130	Pass	
2.6-Dichlorophenol	%	99			30-130	Pass	
4-Chloro-3-methylphenol	%	73			30-130	Pass	
Pentachlorophenol	%	86			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated) USEPA 8270C Phenols		Result 1					
2-Methylphenol (o-Cresol)	%	78			30-130	Pass	
2-Nitrophenol	%	98			30-130	Pass	
2.4-Dimethylphenol	%	58			30-130	Pass	
2.4-Dinitrophenol	%	93			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	72			30-130	Pass	
4-Nitrophenol	%	31			30-130	Pass	
Phenol	%	42			30-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	109			70-130	Pass	
Toluene	%	110			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
Total m+p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	104			70-130	Pass	
Xylenes(ortho.meta and para)	%	104			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	78			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	88			70-130	Pass	
Benz(a)anthracene	%	84			70-130	Pass	
Benzo(a)pyrene	%	89			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	92			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Chrysene	%	87			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	85			70-130	Pass	
Fluorene	%	80			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	89			70-130	Pass	
Naphthalene	%	81			70-130	Pass	
Phenanthrene	%	87			70-130	Pass	
Pyrene	%	86			70-130	Pass	
LCS - % Recovery							
		Result 1					
Cyanide (weak acid dissoc.)	%	82			70-130	Pass	
LCS - % Recovery							
Heavy Metals USEPA 6020 Heavy Metals & USEPA 7470/71 Mer		Result 1					
Lead (filtered)	%	98			80-120	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Mercury (filtered)	%	97			70-130	Pass	
[Duplicate of 11-MA30516 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C10-C14 Fraction by GC	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/L	< 0.2	< 0.2	<1	30%	Pass	
TRH C29-C36 Fraction by GC	mg/L	0.079	0.13	<1	30%	Pass	
[Duplicate of 11-MA02137 - BATCH]							
Phenols (Halogenated)		Result 1	Result 2	RPD			
2-Chlorophenol	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	mg/L	< 0.003	< 0.003	<1	30%	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03	< 0.03	<1	30%	Pass	
[Duplicate of 11-MA02137 - BATCH]							
Phenols (non-Halogenated)		Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Nitrophenol	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	mg/L	< 0.03	< 0.03	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	mg/L	< 0.003	< 0.003	<1	30%	Pass	
[Duplicate of 11-MA30516 - BATCH]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total m+p-Xylenes	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/L	< 0.003	< 0.003	<1	30%	Pass	
[Duplicate of 11-MA02137 - BATCH]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
[Duplicate of 11-MA30474]							
		Result 1	Result 2	RPD			
Cyanide (free)	mg/L	0.007	0.005	33	30%	Fail	Q02
Cyanide (weak acid dissoc.)	mg/L	0.01	0.12	<1	30%	Pass	
[Duplicate of 11-MA03017 - BATCH]							
Heavy Metals		Result 1	Result 2	RPD			
Aluminium (filtered)	mg/L	< 0.05	< 0.05	6.2	30%	Pass	
Antimony (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Arsenic (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barium (filtered)	mg/L	< 0.02	< 0.02	3	30%	Pass	
Beryllium (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Chromium (filtered)	mg/L	< 0.001	< 0.001	3.7	30%	Pass	
Cobalt (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	mg/L	0.044	0.044	<1	30%	Pass	
Lead (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium (filtered)	mg/L	0.0011	0.0011	<1	30%	Pass	
Silver (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Vanadium (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	mg/L	0.046	0.047	1.4	30%	Pass	
Mercury (filtered)	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
[Spike of 11-MA30516 - BATCH] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C6-C9 Fraction by GC	%	97			70 - 130	Pass	
TRH C15-C28 Fraction by GC	%	87			70 - 130	Pass	
[Spike of 11-MA30474] - % Recovery							
Phenols (Halogenated)		Result 1					
2-Chlorophenol	%	90			30 - 130	Pass	
2.4-Dichlorophenol	%	93			30 - 130	Pass	
2.4.5-Trichlorophenol	%	109			30 - 130	Pass	
2.4.6-Trichlorophenol	%	91			30 - 130	Pass	
2.6-Dichlorophenol	%	100			30 - 130	Pass	
4-Chloro-3-methylphenol	%	83			30 - 130	Pass	
Pentachlorophenol	%	107			30 - 130	Pass	
Tetrachlorophenols - Total	%	84			30 - 130	Pass	
[Spike of 11-MA30474] - % Recovery							
Phenols (non-Halogenated)		Result 1					
2-Cyclohexyl-4.6-dinitrophenol	%	76			30 - 130	Pass	
2-Methyl-4.6-dinitrophenol	%	88			30 - 130	Pass	
2.4-Dimethylphenol	%	56			30 - 130	Pass	
2.4-Dinitrophenol	%	57			30 - 130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	72			30 - 130	Pass	
4-Nitrophenol	%	38			30 - 130	Pass	
Dinoseb	%	95			30 - 130	Pass	
Phenol	%	38			30 - 130	Pass	
[Spike of 11-MA30516 - BATCH] - % Recovery							
BTEX		Result 1					
Benzene	%	107			70 - 130	Pass	
Toluene	%	107			70 - 130	Pass	
Ethylbenzene	%	100			70 - 130	Pass	
Total m+p-Xylenes	%	99			70 - 130	Pass	
o-Xylene	%	100			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	99			70 - 130	Pass	
[Spike of 11-MA30474] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	95			70 - 130	Pass	
Acenaphthylene	%	105			70 - 130	Pass	
Anthracene	%	70			70 - 130	Pass	
Benz(a)anthracene	%	107			70 - 130	Pass	
Benzo(a)pyrene	%	109			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	105			70 - 130	Pass	
Benzo(g.h.i)perylene	%	118			70 - 130	Pass	
Chrysene	%	99			70 - 130	Pass	
Dibenz(a.h)anthracene	%	120			70 - 130	Pass	
Fluoranthene	%	102			70 - 130	Pass	
Fluorene	%	104			70 - 130	Pass	
Indeno(1.2.3-cd)pyrene	%	116			70 - 130	Pass	
Naphthalene	%	91			70 - 130	Pass	
Phenanthrene	%	102			70 - 130	Pass	
Pyrene	%	102			70 - 130	Pass	
[Spike of 11-MA30474] - % Recovery							
		Result 1					
Cyanide (weak acid dissoc.)	%	84			70 - 130	Pass	
[Spike of 11-MA03017 - BATCH] - % Recovery							
Heavy Metals		Result 1					
Aluminium (filtered)	%	84			70 - 130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Antimony (filtered)	%	112			70 - 130	Pass	
Arsenic (filtered)	%	89			70 - 130	Pass	
Barium (filtered)	%	86			70 - 130	Pass	
Beryllium (filtered)	%	94			70 - 130	Pass	
Cadmium (filtered)	%	80			70 - 130	Pass	
Chromium (filtered)	%	91			70 - 130	Pass	
Cobalt (filtered)	%	91			70 - 130	Pass	
Copper (filtered)	%	89			70 - 130	Pass	
Lead (filtered)	%	89			70 - 130	Pass	
Manganese (filtered)	%	88			70 - 130	Pass	
Nickel (filtered)	%	88			70 - 130	Pass	
Selenium (filtered)	%	86			70 - 130	Pass	
Silver (filtered)	%	79			70 - 130	Pass	
Vanadium (filtered)	%	93			70 - 130	Pass	
Zinc (filtered)	%	88			70 - 130	Pass	
Mercury (filtered)	%	82			70 - 130	Pass	

Comments

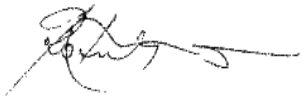
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	Yes

Qualifier Codes/Comments

Code	Description
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Chain of Custody

Subcon / Shared Lab / Split WO
Lab / Analysis: Labmark COC #2.
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attach PO / Internal

SV55 57 V264B M49 IN56

AECOM

AECOM - Sydney
Level 5, 828 Pacific Highway
Gordon, NSW 2072
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
E-mail: Anthony.Davis@aecom.com; Kate.O'Brien@aecom.com

Environmental Division Sydney
Work Order
ES1104161

Telephone : +61-2-8784 8555

Laboratory Details
Lab. Name: ALS
Lab. Address: 277 Woodpark Road, Smithfield NSW 2164
Contact Name:
Tel: 8784 8555
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: **SY/418/10 V2**

Sampled By: Lauren Kontus/Kate O'Brien
AECOM Project No: 60153531/6.1
Project Name: Barangaroo VMP DGI
PO No. **39540AUS**

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details:)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ✓ Email :	

Lab. ID	Sample ID	Sampling Date	Sampling Time	soil	water	other	filt'ed	acid	ice	other	Container (No. & type)	Analysis Request: METALS (M13) (ultratrace)	Al, Sb, Se, Ag (ultratrace)	TPH / BTEX	PAHs / Phenols	Free & WAD Cyanide	2x Lab Filtered ultratrace PAHs / phenols	Other
1	MW69	25-2-11	12:10		X				X		2A, 2V, 2P	X	X	X	X	X	X	* Please analyse sediments on filter paper for each sample where possible for PAHs only
2 (410)	MW401	25-2-11	16:30		X				X			X	X	X	X	X	X	
3	IT3S	25-2-11	11:05		X				X			X	X	X	X	X	X	
4	IT3M	25-2-11	9:50		X				X			X	X	X	X	X	X	
5	IT3D	25-2-11	10:45		X				X			X	X	X	X	X	X	
6	MW198	25-2-11	14:00		X				X			X	X	X	X	X	X	
7	QC618	25-2-11	—		X				X			✓	✓	✓	✓	✓	✓	
Extra - 8	QC-615	25/2/11										X	X	X	X	X		
9	QC-616				Forward to Labmark							X	X	X	X	X		
	11-MA30474																	

10.0°C

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: A = amber, V = vial, P = plastic

Lab Report No. 292248
Esky ID

Relinquished by: Lauren Kontus
Signed:
Date: 25/2/11 1645

Recieved by: Taylor McKendrick
Signed:
Date: 25/2/11 1700

Printed copies of this document are uncontrolled
Page: 1 of 1
Date: 26/08/2010

Relinquished by:
Signed:
Date: 2/3/11

Recieved by: Dan Thompson
Signed:

BMS-PM-DV-F046
Revision: Jun 08

mgt LabMark ENVIRONMENTAL LABORATORIES

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Sydney
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Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Anthony Davis
Client job number: BARANGAROO VMP DGI 60153531/6.1
COC number: Not provided
Turn around time: 5 Day
Date received: Mar 3, 2011
MGT lab reference: **292248**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☑ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Metals (As, Be, Ba, Cd, Cr, Co, Cu, Ni, Pb, Mn, V, Zn, Hg) unless otherwise instructed) & Phenols (Speciated unless otherwise instructed) by mgt Labmark Melbourne - results may be delayed.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Anthony Davis - anthony.davis@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
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NATA Site # 1261

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA Acc # 1645

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 292248
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Mar 3, 2011 12:00
Due: Mar 10, 2011 08:10
Priority: 5 Day
Contact name: Anthony Davis

Client Job No.: BARANGAROO VMP DGI 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					Aluminium (filtered)	Antimony (filtered)	Arsenic (filtered)	Barium (filtered)	Beryllium (filtered)	Cadmium (filtered)	Chromium (filtered)	Cobalt (filtered)	Copper (filtered)	Cyanide (free)	Cyanide (weak acid dissoc.)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Selenium (filtered)	Silver (filtered)	Vanadium (filtered)	Zinc (filtered)	Total Recoverable Hydrocarbons	Phenols (IWRG 621)	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																											
Oakleigh Laboratory - NATA Site #1261					X	X	X	X	X	X	X	X	X			X	X	X	X	X	X	X	X		X		
Thornleigh Laboratory - NATA Site #18217																											
Asquith Laboratory - NATA Site #13535														X	X									X		X	X
Clayton Laboratory - NATA Site #1645																											
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																							
QC-616	Feb 24, 2011		Water	A11-MA30474	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt LabMark ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Kate O'Brien

NATA Accredited
Accreditation Number 1261
Site Number 18217

This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Report	295989-S
Client Reference	BARANGAROO 60153531/6.1
Received Date	Apr 08, 2011

Client Sample ID			**QC623**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**S11-Ap30520**
Date Sampled			**Apr 05, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	10	mg/kg	< 10
BTEX			
Benzene	0.5	mg/kg	< 0.5
Toluene	0.5	mg/kg	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1
o-Xylene	0.5	mg/kg	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15
Total BTEX	1	mg/kg	< 1
4-Bromofluorobenzene (surr.)	1	%	91
Total Recoverable Hydrocarbons			
TRH C10-C14 Fraction by GC	50	mg/kg	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	< 100
TRH C10-36 (Total)	100	mg/kg	< 100
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	1.2
Benzo(a)pyrene	0.5	mg/kg	1.3
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	2.0
Benzo(g.h.i)perylene	0.5	mg/kg	0.8
Chrysene	0.5	mg/kg	1.1
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	3.0
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	0.6
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	1.4
Pyrene	0.5	mg/kg	3.0
Total PAH	1	mg/kg	14
2-Fluorobiphenyl (surr.)	1	%	125
p-Terphenyl-d14 (surr.)	1	%	117
Mercury	0.05	mg/kg	0.39
Arsenic	1	mg/kg	3.5

Client Sample ID			**QC623**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**S11-Ap30520**
Date Sampled			**Apr 05, 2011**
Test/Reference	LOR	Unit	
Cadmium	0.1	mg/kg	0.2
Chromium	1	mg/kg	6.5
Copper	2	mg/kg	35
Lead	2	mg/kg	220
Nickel	1	mg/kg	4.1
Zinc	5	mg/kg	150
% Moisture	0.1	%	33

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Apr 11, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Sydney	Apr 11, 2011	14 Day
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Apr 11, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	Apr 11, 2011	14 Day
Mercury	Sydney	Apr 11, 2011	28 Day
% Moisture - Method: E005 Moisture Content	Sydney	Apr 11, 2011	28 Day

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 9564 7055
NATA # 1261 & 1645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 295989
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Apr 8, 2011 12:00
Due: Apr 15, 2011 04:26
Priority: 5 Day
Contact name: Kate O'Brien

Client Job No.: BARANGAROO 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Melbourne Laboratory - NATA Site #1261																	
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC623	Apr 05, 2011		Soil	S11-Ap30520	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/kg	< 1			1	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Mercury	mg/kg	< 0.05			0.05	Pass	
Arsenic	mg/kg	< 1			1	Pass	
Cadmium	mg/kg	< 0.1			0.1	Pass	
Chromium	mg/kg	< 1			1	Pass	
Copper	mg/kg	< 2			2	Pass	
Lead	mg/kg	< 2			2	Pass	
Nickel	mg/kg	< 1			1	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	73			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	90			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
Total m+p-Xylenes	%	88			70-130	Pass	
o-Xylene	%	83			70-130	Pass	
Xylenes(ortho.meta and para)	%	86			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C15-C28 Fraction by GC	%	92			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	89			70-130	Pass	
Acenaphthylene	%	80			70-130	Pass	
Anthracene	%	91			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	

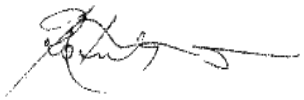
Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Benzo(a)pyrene	%	83			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	83			70-130	Pass	
Benzo(g.h.i)perylene	%	82			70-130	Pass	
Chrysene	%	83			70-130	Pass	
Dibenz(a.h)anthracene	%	76			70-130	Pass	
Fluoranthene	%	81			70-130	Pass	
Fluorene	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	79			70-130	Pass	
Naphthalene	%	91			70-130	Pass	
Phenanthrene	%	82			70-130	Pass	
Pyrene	%	84			70-130	Pass	
LCS - % Recovery							
		Result 1					
Mercury	%	87			70-130	Pass	
Arsenic	%	94			70-130	Pass	
Cadmium	%	97			70-130	Pass	
Chromium	%	101			70-130	Pass	
Copper	%	102			70-130	Pass	
Lead	%	102			70-130	Pass	
Nickel	%	99			70-130	Pass	
Zinc	%	108			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

295989

page 1 of 2

Form:

AECOM

Chain of Custody & Analysis Request Form

AECOM - Sydney (Gordon) PO Box 726 Pymble NSW 2073 Australia	Tel: 61 2 8484 8999 Fax: 61 2 8484 8989 Email Kate.O'Brien@aecom.com
Laboratory Details Lab. Name: ALS Lab. Address: Contact Name: Lab. Ref:	Tel: Fax: Preliminary Report by: Final Report by: Lab Quote No:

Project Name: [illegible] **Project Number:** 60153631 / 6.1 **Purchase Order Number:**

Sample collected by: Lauren Kanis **Sample Results to be returned to:**

Specifications: [illegible]

Subcon / Forward Lab. / Split WO

1. Urgent TAT required? (please circle: 24hr 48hr ___days)	Lab / Analysis:	☐ Yes MGT / ☐ No Labmark	☐ N/A
2. Fast TAT Guarantee Required?	Organised By / Date:	☐ Yes ☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extraction?	Relinquished By / Date:	☐ Yes ☐ No	☐ N/A
4. Special storage requirements?	Connote / Courier:	☐ Yes ☐ No	☐ N/A
5. Preservation requirements?	WO No.:	☐ Yes ☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☒ Email	Attach By WO / Internal Sheet:		
7 Report Format:	8. Project Manager: [illegible] tel: [illegible]		

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	water	other	Preservation: fil'ed	acid	ice	other	Container (No. & type)	Analysis Request	Remarks & comments
1	BH413_1.1-1.3	1-4-11		X					X		Jar.	X	Please contact Kate O'Brien regarding samples to be analysed
(10)	BH413_2.0-2.3			X					X			X	
2	BH413_4.0-4.2			X					X			X	
(11)	BH413_5.0-5.15			X					X			X	
3	BH413_6.0-6.15			X					X			X	
(12)	BH413_8.0-8.1			X					X			X	
4	BH413_9.0-9.2			X					X			X	
(13)	BH413_10.0-10.2			X					X			X	
5	BH413_15.0-15.5	5-4-11		X					X			X	
(14)	BH413_16.0-16.2	↓		X					X			X	

Relinquished By:		**Received by:**	
Name: Lauren Kanis	Date: 6.4.11	Name: Sam	6/4/11
of: AECOM	Time: 9:00	of: ALS	1:45
Relinquished By:		**Received by:** SL	
Name:	Date:	Name: Laurie	8/4/11
of:	Time:	of: mgt labmark	3:30

Printed copies of this document

Environmental Division
Sydney
Work Order
ES1107354

No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
No/NA	Consignment Note No.	
No/NA	Transport Co:	
No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
No/NA	Consignment Note No:	
No/NA	Transport Co:	

URGENT

Environment

Page 1 of 1

Telephone : +61-2-8784 8555

Revision: Oct 08

BMS-PM-DV-F046

#295989 page 2 of 2

Form:

AECOM

Chain of Custody & Analysis Request Form

page 1

AECOM - Sydney (Gordon)
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 8484 8999
Fax: 61 2 8484 8989
Email [illegible]

Laboratory Details
Lab. Name: ALS
Lab. Address: [illegible]
Contact Name: [illegible]
Lab. Ref:
Tel: [illegible]
Fax: [illegible]
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: [illegible] **Project Number:** [illegible] **Purchase Order Number:** [illegible]

Sample collected by: Lauren Kontus **Sample Results to be returned to:** [illegible]

Specifications: [illegible]

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	☐ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☐ N/A
4. Special storage requirements?	☐ Yes	☐ No	☐ N/A
5. Preservation requirements?	☐ Yes	☐ No	☐ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☐ N/A

7 Report Format: 8. Project Manager: [illegible] tel: [illegible]

Analysis Request

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: fill'ed	Preservation: acid	Preservation: Ice	Preservation: other	Container (No. & type)	Remarks & comments
6	BH413_16.4-16.6	5.4.11							X		1jar	see note page 1.
7	QC621	1-4-11			X				X		2V, 1A, 1P	
8	QC622	5-4-11		X					X		1jar	
11AP30520	QC623	5-4-11		X					X		1jar	
9	QC624	5-4-11			X				X		2V, 1A, 1P	

Relinquished By:	Received by:		
Name: Lauren Kontus	Name: Sam	Date: 6/4/11	Received in good condition? Yes/No/NA
of: AECOM	of: ALS	Time: 1245	Samples received chilled? Yes/No/NA
Date: 6.4.11			Consignment Note No.
Time: 9:00			Transport Co:
			Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand

Relinquished By:	Received by:		
Name:	Name: Sarah	Date: 8/4/11	Received in good condition? Yes/No/NA
of:	of: myf catmail	Time: 3:30	Samples received chilled? Yes/No/NA
Date:			Consignment Note No.
Time:			Transport Co:
			Method of Shipment: ☐ Courier ☐ Postal ☐ By Hand

~~Printed copies of this document are uncontrolled~~

~~Revision: Oct 09~~

295989

rec'd SE mgt labmark 8/4/11 3:30p

Wael Saleh

From: McGrath, Kate [Kate.O'Brien@aecom.com]
Sent: Thursday, 7 April 2011 2:25 PM
To: Wael Saleh
Cc: Davis, Anthony
Subject: RE: Barangaroo Samples April 1st and 5th ON HOLD

Hi Wael,

URGENT

Could we please get the following soil samples analysed for metals (As, Cd, Cu, Cr, Ni, Pb, Hg and Zn) TPH, BTEX, PAH:

BH413_1.1-1.3

BH413_4.0-4.2

BH413_6.0-6.15

BH413_9.0-9.2

BH413_15.0-15.5

BH413_16.4-16.6

QC622

Subcon: Forward Lab / Split WO
Lab / Analysis: Forward to MGT Labmark
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No: EB1107354
Attach By PO / Internal Sheet:

Please analyse water samples QC621 and QC624 for metals*, TPH, BTEX, PAH

Please send QC623 to MGT Labmark Lane Cove for analysis – metals/TPH/BTEX/PAH

Lab ID: 11AP30520

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072
PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

Please consider the environment before printing this email.

#295989 rec'd SR not labmark 8/4/11 3:30pm

From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Thursday, April 07, 2011 1:33 PM
To: McGrath, Kate
Subject: Barangaroo Samples April 1st and 5th ON HOLD
Importance: High

Hi Kate,

Please see attached file. Please indicate which samples require to be analysed.

Thanks and regards

How was your customer experience? Please send us your feedback

Wael Saleh

Creation/Committal Coordinator

ALS Environmental

277 Woodpark Road

Smithfield, NSW, 2164

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Phone: +61 2 8784 8555

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Email: wael.saleh@alsglobal.com

mgt LabMark ENVIRONMENTAL LABORATORIES

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Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA # 1261 & 1645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Kate O'Brien
Client job number: BARANGAROO 60153531/6.1
COC number: Not provided
Turn around time: 5 Day
Date received: Apr 8, 2011
MGT lab reference: **295989**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) analysed unless instructed otherwise.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Kate O'Brien - kate.obrien@aecom.com.

mgt Labmark Sample Receipt

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1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 295989
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Apr 8, 2011 12:00
Due: Apr 15, 2011 04:26
Priority: 5 Day
Contact name: Kate O'Brien

Client Job No.: BARANGAROO 60153531/6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Melbourne Laboratory - NATA Site #1261																	
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC623	Apr 05, 2011		Soil	S11-Ap30520	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt LabMark
ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Kate O'Brien

NATA Accredited
Accreditation Number 1261
Site Number 18217

This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Report	296313-S
Client Reference	BARANGAROO 60153531 - 6.1
Received Date	Apr 12, 2011

Client Sample ID			**QC628**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**S11-Ap30805**
Date Sampled			**Apr 06, 2011**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons			
TRH C6-C9 Fraction by GC	10	mg/kg	< 10
BTEX			
Benzene	0.5	mg/kg	< 0.5
Toluene	0.5	mg/kg	< 0.5
Ethylbenzene	0.5	mg/kg	< 0.5
Total m+p-Xylenes	1	mg/kg	< 1
o-Xylene	0.5	mg/kg	< 0.5
Xylenes(ortho.meta and para)	0.15	mg/kg	< 0.15
Total BTEX	1	mg/kg	< 1
4-Bromofluorobenzene (surr.)	1	%	91
Total Recoverable Hydrocarbons			
TRH C10-C14 Fraction by GC	50	mg/kg	< 50
TRH C15-C28 Fraction by GC	100	mg/kg	< 100
TRH C29-C36 Fraction by GC	100	mg/kg	< 100
TRH C10-36 (Total)	100	mg/kg	< 100
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b)fluoranthene & Benzo(k)fluoranthene	1	mg/kg	< 1
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH	1	mg/kg	< 1
2-Fluorobiphenyl (surr.)	1	%	103
p-Terphenyl-d14 (surr.)	1	%	112
Heavy Metals			
Mercury	0.05	mg/kg	< 0.05
Arsenic	1	mg/kg	1.4

Client Sample ID			**QC628**
Sample Matrix			**Soil**
mgt-LabMark Sample No.			**S11-Ap30805**
Date Sampled			**Apr 06, 2011**
Test/Reference	LOR	Unit	
Cadmium	0.1	mg/kg	< 0.1
Chromium	1	mg/kg	11
Copper	2	mg/kg	6.9
Nickel	1	mg/kg	1.1
Zinc	5	mg/kg	< 5
Lead	2	mg/kg	7.5
% Moisture	0.1	%	23

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Apr 13, 2011	14 Day
BTEX - Method: E029/E016 BTEX	Sydney	Apr 13, 2011	14 Day
Total Recoverable Hydrocarbons - Method: E004 Petroleum Hydrocarbons (TPH)	Sydney	Apr 13, 2011	14 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	Apr 13, 2011	14 Day
Mercury	Sydney	Apr 13, 2011	28 Day
% Moisture - Method: E005 Moisture Content	Sydney	Apr 13, 2011	28 Day

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1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 296313
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Apr 12, 2011 12:00
Due: Apr 19, 2011 05:27
Priority: 5 Day
Contact name: Kate O'Brien

Client Job No.: BARANGAROO 60153531 - 6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Melbourne Laboratory - NATA Site #1261																	
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC628	Apr 06, 2011		Soil	S11-Ap30805	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C6-C9 Fraction by GC	mg/kg	< 10			10	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.5			0.5	Pass	
Total m+p-Xylenes	mg/kg	< 1			1	Pass	
o-Xylene	mg/kg	< 0.5			0.5	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15			0.15	Pass	
Total BTEX	mg/kg	< 1			1	Pass	
Method Blank							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor							
TRH C10-C14 Fraction by GC	mg/kg	< 50			50	Pass	
TRH C15-C28 Fraction by GC	mg/kg	< 100			100	Pass	
TRH C29-C36 Fraction by GC	mg/kg	< 100			100	Pass	
Method Blank							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	mg/kg	< 1			1	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Mercury	mg/kg	< 0.05			0.05	Pass	
Arsenic	mg/kg	< 1			1	Pass	
Cadmium	mg/kg	< 0.1			0.1	Pass	
Chromium	mg/kg	< 1			1	Pass	
Copper	mg/kg	< 2			2	Pass	
Nickel	mg/kg	< 1			1	Pass	
Zinc	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 2			2	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C6-C9 Fraction by GC	%	77			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX		Result 1					
Benzene	%	96			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
Total m+p-Xylenes	%	105			70-130	Pass	
o-Xylene	%	104			70-130	Pass	
Xylenes(ortho.meta and para)	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons E004 Petroleum Hydrocarbor		Result 1					
TRH C15-C28 Fraction by GC	%	111			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	76			70-130	Pass	
Acenaphthylene	%	75			70-130	Pass	
Anthracene	%	77			70-130	Pass	
Benz(a)anthracene	%	71			70-130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Benzo(a)pyrene	%	75			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	74			70-130	Pass	
Benzo(g.h.i)perylene	%	79			70-130	Pass	
Chrysene	%	72			70-130	Pass	
Dibenz(a.h)anthracene	%	70			70-130	Pass	
Fluoranthene	%	71			70-130	Pass	
Fluorene	%	73			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	74			70-130	Pass	
Naphthalene	%	81			70-130	Pass	
Phenanthrene	%	74			70-130	Pass	
Pyrene	%	71			70-130	Pass	
LCS - % Recovery							
		Result 1					
Mercury	%	106			70-130	Pass	
Arsenic	%	100			70-130	Pass	
Cadmium	%	86			70-130	Pass	
Chromium	%	106			70-130	Pass	
Copper	%	101			70-130	Pass	
Nickel	%	104			70-130	Pass	
Zinc	%	98			70-130	Pass	
Lead	%	84			70-130	Pass	
[Duplicate of S11-Ap30791 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C6-C9 Fraction by GC	mg/kg	< 10	< 10	<1	30%	Pass	
[Duplicate of S11-Ap30791 - BATCH]							
BTEX		Result 1	Result 2	RPD			
Benzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Total m+p-Xylenes	mg/kg	< 1	< 1	<1	30%	Pass	
o-Xylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes(ortho.meta and para)	mg/kg	< 0.15	< 0.15	<1	30%	Pass	
[Duplicate of S11-Ap30882 - BATCH]							
Total Recoverable Hydrocarbons		Result 1	Result 2	RPD			
TRH C10-C14 Fraction by GC	mg/kg	110	110	<1	30%	Pass	
TRH C15-C28 Fraction by GC	mg/kg	530	540	<1	30%	Pass	
TRH C29-C36 Fraction by GC	mg/kg	110	110	2	30%	Pass	
[Duplicate of S11-Ap30994 - BATCH]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/kg	< 1	< 1	<1	30%	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
[Duplicate of S11-Ap31259 - BATCH]							
		Result 1	Result 2	RPD			
Mercury	mg/kg	< 0.001	< 0.001	97	30%	Fail	Q15
Arsenic	mg/kg	2.8	1.8	5	30%	Pass	
Cadmium	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Chromium	mg/kg	24	25	7	30%	Pass	
Copper	mg/kg	20	18	8	30%	Pass	
Nickel	mg/kg	64	24	91	30%	Fail	Q15
Zinc	mg/kg	8	8.7	8	30%	Pass	
Lead	mg/kg	9.2	6.3	35	30%	Fail	Q15
[Spike of S11-Ap30791 - BATCH] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
TRH C6-C9 Fraction by GC	%	82			70 - 130	Pass	
[Spike of S11-Ap30791 - BATCH] - % Recovery							
BTEX		Result 1					
Benzene	%	91			70 - 130	Pass	
Toluene	%	96			70 - 130	Pass	
Ethylbenzene	%	96			70 - 130	Pass	
Total m+p-Xylenes	%	94			70 - 130	Pass	
o-Xylene	%	96			70 - 130	Pass	
Xylenes(ortho.meta and para)	%	95			70 - 130	Pass	
[Spike of S11-Ap30882 - BATCH] - % Recovery							
Total Recoverable Hydrocarbons		Result 1					
TRH C15-C28 Fraction by GC	%	109			70 - 130	Pass	
[Spike of S11-Ap30805] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	103			70 - 130	Pass	
Acenaphthylene	%	98			70 - 130	Pass	
Anthracene	%	90			70 - 130	Pass	
Benz(a)anthracene	%	98			70 - 130	Pass	
Benzo(a)pyrene	%	93			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	101			70 - 130	Pass	
Benzo(g.h.i)perylene	%	97			70 - 130	Pass	
Chrysene	%	97			70 - 130	Pass	
Dibenz(a.h)anthracene	%	92			70 - 130	Pass	
Fluoranthene	%	89			70 - 130	Pass	
Fluorene	%	101			70 - 130	Pass	
Indeno(1.2.3-cd)pyrene	%	93			70 - 130	Pass	
Naphthalene	%	103			70 - 130	Pass	
Phenanthrene	%	114			70 - 130	Pass	
Pyrene	%	91			70 - 130	Pass	
[Spike of S11-Ap30805] - % Recovery							
		Result 1					
Mercury	%	87			70 - 130	Pass	
Arsenic	%	84			70 - 130	Pass	
Cadmium	%	94			70 - 130	Pass	
Chromium	%	99			70 - 130	Pass	
Copper	%	101			70 - 130	Pass	
Nickel	%	104			70 - 130	Pass	
Zinc	%	93			70 - 130	Pass	
Lead	%	85			70 - 130	Pass	

Comments

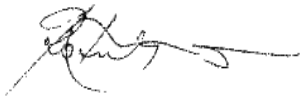
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes mgt-LabMark's Acceptance Criteria as stipulated in AS-POL-002. Refer to Glossary Page of this report for further details

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

5x-65 # 296313

Wael Saleh

From: McGrath, Kate [Kate.O'Brien@aecom.com]
Sent: Monday, 11 April 2011 11:20 AM
To: Wael Saleh
Subject: RE: Barangaroo - Samples taken 6/4/11 - 8/4/11 Rec'd SK 12/4/11 @ 4:15pm.

Hi Wael,

Could I please get the following samples analysed for 8 Metals, TPH, BTEX and PAHs

BH412_3.0-3.1
BH412_4.0-4.1
BH412_8.0-8.1
BH412_11.0-11.2
BH412_19-19.3
BH412_22.0-22.2
QC627
TRIPBLANK – please analyse for just TPH C_6-C_9 and BTEX

#17
#18
#19

Could you please send QC628 to MGT Labmark for analysis for 8 Metals, TPH, BTEX and PAHs
LabID : 11AP30805

Regards,

Kate McGrath
Professional Scientist
D +61 2 8484 8939
Kate.O'Brien@aecom.com

AECOM
Level 5, 828 Pacific Highway, Gordon, NSW 2072
PO Box 726 Pymble NSW 2073
T +61 2 8484 8999 F +61 2 8484 8989
www.aecom.com

Please consider the environment before printing this email.

-.. -.. -
From: Wael Saleh [mailto:Wael.Salem@alsglobal.com]
Sent: Monday, April 11, 2011 10:30 AM
To: McGrath, Kate
Subject: Barangaroo - Samples taken 6/4/11 - 8/4/11
Importance: High

Hi Kate,

Please confirm this is the only analysis you require.

Kind regards

How was your customer experience? Please send us your feedback

Wael Saleh
Creation/Committal Coordinator

mgt LabMark ENVIRONMENTAL LABORATORIES

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 9564 7055
NATA # 1261 & 1645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Kate O'Brien
Client job number: BARANGAROO 60153531 - 6.1
COC number: Not provided
Turn around time: 5 Day
Date received: Apr 12, 2011
MGT lab reference: **296313**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Sampling date on jar 6/4/11.

Contact notes

If you have any questions with respect to these samples please contact:

Leanne Knowles on Phone : +61 2 9476 6533 or by e.mail: leanne.knowles@labmark.com.au

Results will be delivered electronically via e.mail to Kate O'Brien - kate.obrien@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 9564 7055
NATA # 1261 & 1645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 296313
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: Apr 12, 2011 12:00
Due: Apr 19, 2011 05:27
Priority: 5 Day
Contact name: Kate O'Brien

Client Job No.: BARANGAROO 60153531 - 6.1

mgt-LabMark Client Manager: Leanne Knowles

Sample Detail					% Moisture	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	TRH C6-C9 Fraction by GC	Zinc	Total Recoverable Hydrocarbons	BTEX	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																	
Melbourne Laboratory - NATA Site #1261																	
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
QC628	Apr 06, 2011		Soil	S11-Ap30805	X	X	X	X	X	X	X	X	X	X	X	X	X

mgt LabMark ENVIRONMENTAL LABORATORIES

Certificate of Analysis

AECOM Aust P/L Sydney
Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Attention: Kate McGrath

NATA Accredited
Accreditation Number 1261
Site Number 18217

This document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Report	300143-W
Client Reference	BARANGAROO ANALYSIS REQUEST
Received Date	May 23, 2011

Client Sample ID **Sample Matrix** **mgt-LabMark Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**QC645** **Water** **(Ultra-trace)** **S11-My32646** **May 19, 2011**
Speciated Phenols			
2.4-Dichlorophenol	0.002	mg/L	< 0.002
2.4-Dimethylphenol	0.002	mg/L	< 0.002
2.4.5-Trichlorophenol	0.002	mg/L	< 0.002
2.4.6-Trichlorophenol	0.002	mg/L	< 0.002
Phenol	0.002	mg/L	< 0.002
2-Methylphenol (o-Cresol)	0.002	mg/L	< 0.002
3&4-Methylphenol (m&p-Cresol)	0.004	mg/L	< 0.004
2-Chlorophenol	0.002	mg/L	< 0.002
2-Nitrophenol	0.002	mg/L	< 0.002
4-Chloro-3-methylphenol	0.002	mg/L	< 0.002
Pentachlorophenol	0.01	mg/L	< 0.01
2.4.6-Tribromophenol (surr.)	1	%	87
Phenol-d5 (surr.)	1	%	97
Polyaromatic Hydrocarbons (PAH)			
Acenaphthene	1e-005	mg/L	0.00030
Acenaphthylene	1e-005	mg/L	0.0043
Anthracene	1e-005	mg/L	0.0018
Benz(a)anthracene	1e-005	mg/L	0.0060
Benzo(a)pyrene	0.00001	mg/L	0.0053
Benzo(b)fluoranthene & Benzo(k)fluoranthene	0.00005	mg/L	0.0098
Benzo(g.h.i)perylene	1e-005	mg/L	0.0029
Chrysene	1e-005	mg/L	0.0044
Dibenz(a.h)anthracene	1e-005	mg/L	0.0012
Fluoranthene	1e-005	mg/L	0.0092
Fluorene	1e-005	mg/L	0.00050
Indeno(1.2.3-cd)pyrene	1e-005	mg/L	0.0027
Naphthalene	1e-005	mg/L	0.00080
Phenanthrene	1e-005	mg/L	0.0041
Pyrene	1e-005	mg/L	0.013
Total PAH	0.00005	mg/L	0.066
2-Fluorobiphenyl (surr.)	1	%	79
p-Terphenyl-d14 (surr.)	1	%	74
Heavy Metals			
Aluminium (filtered)	0.01	mg/L	< 0.01
Antimony (filtered)	0.005	mg/L	< 0.005
Barium (filtered)	0.005	mg/L	0.10

Client Sample ID			QC645
Sample Matrix			Water (Ultra-trace)
mgt-LabMark Sample No.			S11-My32646
Date Sampled			May 19, 2011
Test/Reference	LOR	Unit	
Beryllium (filtered)	0.001	mg/L	< 0.001
Cobalt (filtered)	0.001	mg/L	0.002
Manganese (filtered)	0.001	mg/L	0.18
Selenium (filtered)	0.005	mg/L	< 0.005
Silver (filtered)	0.0001	mg/L	< 0.0001
Vanadium (filtered)	0.005	mg/L	0.010
Arsenic (filtered)	0.001	mg/L	0.018
Cadmium (filtered)	0.0001	mg/L	< 0.0001
Chromium (filtered)	0.001	mg/L	0.017
Copper (filtered)	0.001	mg/L	0.010
Lead (filtered)	0.001	mg/L	< 0.001
Mercury (filtered)	0.0001	mg/L	< 0.0001
Nickel (filtered)	0.001	mg/L	0.035
Zinc (filtered)	0.005	mg/L	0.011

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Holding Time
Speciated Phenols - Method: E008 Speciated Phenols	Sydney	May 27, 2011	7 Day
Polyaromatic Hydrocarbons (PAH) - Method: E007 Polyaromatic Hydrocarbons (PAH)	Sydney	May 27, 2011	7 Day
Aluminium (filtered)	Sydney	May 24, 2011	180 Day

mgt LabMark ENVIRONMENTAL LABORATORIES

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

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3-5 Kingston Town Close
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Phone : +61 3 9564 7055
NATA # 1261 & 1645
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Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 300143
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: May 23, 2011 12:00
Due: May 30, 2011 03:13
Priority: 5 Day
Contact name: Kate McGrath

Client Job No.: BARANGAROO ANALYSIS REQUEST

mgt-LabMark Client Manager: Dan Thompson

Sample Detail					Aluminium (filtered)	Antimony (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Manganese (filtered)	Selenium (filtered)	Silver (filtered)	Vanadium (filtered)	Metals M8 filtered	Speciated Phenols	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																
Melbourne Laboratory - NATA Site #1261																
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
QC645	May 19, 2011		Water (Ultra-trace)	S11-My32646	X	X	X	X	X	X	X	X	X	X	X	X

mgt-LabMark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)
For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.
If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	**mg/L:** milligrams per litre
µg/l: micrograms per litre	**ppm:** Parts per million
ppb: Parts per billion	**%:** Percentage
org/100ml: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:
Results <10 times the LOR : No Limit
Results between 10-20 times the LOR : RPD must lie between 0-50%
Results >20 times the LOR : RPD must lie between 0-20%
Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD - eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Speciated Phenols E008 Speciated Phenols							
2.4-Dichlorophenol	mg/L	< 0.002			0.002	Pass	
2.4-Dimethylphenol	mg/L	< 0.002			0.002	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.002			0.002	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.002			0.002	Pass	
Phenol	mg/L	< 0.002			0.002	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.002			0.002	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.004			0.004	Pass	
2-Chlorophenol	mg/L	< 0.002			0.002	Pass	
2-Nitrophenol	mg/L	< 0.002			0.002	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.002			0.002	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Method Blank							
Aluminium (filtered)	mg/L	< 0.01			0.01	Pass	
Antimony (filtered)	mg/L	< 0.005			0.005	Pass	
Barium (filtered)	mg/L	< 0.005			0.005	Pass	
Beryllium (filtered)	mg/L	< 0.001			0.001	Pass	
Cobalt (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.005			0.005	Pass	
Silver (filtered)	mg/L	< 0.0001			0.0001	Pass	
Vanadium (filtered)	mg/L	< 0.005			0.005	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0001			0.0001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Speciated Phenols E008 Speciated Phenols		Result 1					
2.4-Dichlorophenol	%	111			70-130	Pass	
2.4-Dimethylphenol	%	86			70-130	Pass	
2.4.5-Trichlorophenol	%	73			70-130	Pass	
2.4.6-Trichlorophenol	%	117			70-130	Pass	
Phenol	%	106			70-130	Pass	
2-Methylphenol (o-Cresol)	%	100			70-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	102			70-130	Pass	
2-Chlorophenol	%	107			70-130	Pass	
2-Nitrophenol	%	91			70-130	Pass	
4-Chloro-3-methylphenol	%	79			70-130	Pass	
Pentachlorophenol	%	79			70-130	Pass	
LCS - % Recovery							
Polyaromatic Hydrocarbons (PAH) E007 Polyaromatic Hydroca		Result 1					
Acenaphthene	%	77			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	70			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluorar	%	77			70-130	Pass	
Benzo(g.h.i)perylene	%	74			70-130	Pass	
Chrysene	%	81			70-130	Pass	
Dibenz(a.h)anthracene	%	72			70-130	Pass	
Fluoranthene	%	74			70-130	Pass	
Fluorene	%	81			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	72			70-130	Pass	
Naphthalene	%	80			70-130	Pass	
Phenanthrene	%	70			70-130	Pass	
Pyrene	%	71			70-130	Pass	
LCS - % Recovery							
		Result 1					

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Aluminium (filtered)	%	94			70-130	Pass	
Antimony (filtered)	%	94			70-130	Pass	
Barium (filtered)	%	92			70-130	Pass	
Beryllium (filtered)	%	94			70-130	Pass	
Cobalt (filtered)	%	96			70-130	Pass	
Manganese (filtered)	%	95			70-130	Pass	
Selenium (filtered)	%	96			70-130	Pass	
Silver (filtered)	%	87			70-130	Pass	
Vanadium (filtered)	%	73			70-130	Pass	
Arsenic (filtered)	%	97			70-130	Pass	
Cadmium (filtered)	%	91			70-130	Pass	
Chromium (filtered)	%	92			70-130	Pass	
Copper (filtered)	%	99			70-130	Pass	
Lead (filtered)	%	94			70-130	Pass	
Mercury (filtered)	%	100			70-130	Pass	
Nickel (filtered)	%	98			70-130	Pass	
Zinc (filtered)	%	102			70-130	Pass	
[Duplicate of S11-My32834 - BATCH]							
Polyaromatic Hydrocarbons (PAH)		Result 1	Result 2	RPD			
Acenaphthene	mg/L	0.001	0.001	4	30%	Pass	
Acenaphthylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	mg/L	0.004	0.004	3	30%	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	mg/L	0.003	0.002	32	30%	Fail	Q15
Phenanthrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	mg/L	< 0.001	< 0.001	<1	30%	Pass	
[Duplicate of S11-My32333 - BATCH]							
		Result 1	Result 2	RPD			
Aluminium (filtered)	mg/L	0.072	0.072	<1	30%	Pass	
Antimony (filtered)	mg/L	< 0.005	< 0.005	10	30%	Pass	
Barium (filtered)	mg/L	0.027	0.027	1	30%	Pass	
Beryllium (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cobalt (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	mg/L	< 0.001	< 0.001	10	30%	Pass	
Selenium (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Silver (filtered)	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Vanadium (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Arsenic (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Chromium (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	mg/L	0.002	0.002	3	30%	Pass	
Lead (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	mg/L	0.001	0.001	5	30%	Pass	
Zinc (filtered)	mg/L	0.006	0.005	9	30%	Pass	
[Spike of S11-My32835 - BATCH] - % Recovery							
Polyaromatic Hydrocarbons (PAH)		Result 1					
Acenaphthene	%	94			70 - 130	Pass	
Acenaphthylene	%	105			70 - 130	Pass	
Anthracene	%	87			70 - 130	Pass	
Benz(a)anthracene	%	92			70 - 130	Pass	
Benzo(a)pyrene	%	102			70 - 130	Pass	
Benzo(b)fluoranthene & Benzo(k)fluoran	%	100			70 - 130	Pass	
Benzo(g.h.i)perylene	%	82			70 - 130	Pass	
Chrysene	%	95			70 - 130	Pass	
Dibenz(a.h)anthracene	%	86			70 - 130	Pass	
Fluoranthene	%	92			70 - 130	Pass	
Fluorene	%	97			70 - 130	Pass	

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Indeno(1.2.3-cd)pyrene	%	86			70 - 130	Pass	
Naphthalene	%	89			70 - 130	Pass	
Phenanthrene	%	87			70 - 130	Pass	
Pyrene	%	87			70 - 130	Pass	
[Spike of S11-My32334 - BATCH] - % Recovery							
		Result 1					
Aluminium (filtered)	%	100			70 - 130	Pass	
Antimony (filtered)	%	94			70 - 130	Pass	
Barium (filtered)	%	92			70 - 130	Pass	
Beryllium (filtered)	%	101			70 - 130	Pass	
Cobalt (filtered)	%	96			70 - 130	Pass	
Manganese (filtered)	%	95			70 - 130	Pass	
Selenium (filtered)	%	97			70 - 130	Pass	
Silver (filtered)	%	83			70 - 130	Pass	
Vanadium (filtered)	%	74			70 - 130	Pass	
Arsenic (filtered)	%	100			70 - 130	Pass	
Cadmium (filtered)	%	94			70 - 130	Pass	
Chromium (filtered)	%	93			70 - 130	Pass	
Copper (filtered)	%	103			70 - 130	Pass	
Lead (filtered)	%	96			70 - 130	Pass	
Mercury (filtered)	%	97			70 - 130	Pass	
Nickel (filtered)	%	96			70 - 130	Pass	
Zinc (filtered)	%	104			70 - 130	Pass	

Comments

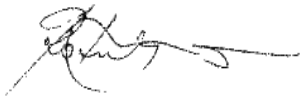
Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
Q15	The RPD reported passes mgt-LabMark's Acceptance Criteria as stipulated in AS-POL-002. Refer to Glossary Page of this report for further details

Authorised By



Dr. Bob Symons
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Jennifer Cullen

From: McGrath, Kate [Kate.McGrath@aecom.com]
Sent: Friday, 20 May 2011 10:50 AM
To: Jennifer Cullen
Cc: Lee, Amanda; Davis, Anthony; Hansen, Catherine
Subject: Barangaroo Analysis Request -Water samples

Hi Jenny

For the water samples collected and submitted yesterday to the lab (19/5/11) please disregard the analysis request on the COC and refer to the requests below.

Work order for Additional VMP DGI job No: 60153531/6.1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D, QC643, QC644, QC646 analysed for

- Ultra-trace PAHs and phenols MY32646.
- Standard level TPH C6 – C36 and BTEX
- Ultra trace metals – As, Ba, Be, Bd, Cr, Co, Cu, Mn, Hg, Ni, Pb, V, Zn, Al, Sb, Se and Ag
- Free and WAD Cyanide

Please send QC645 to Labmark for the above analysis.

Work order for HHERA 60153531 1.S4150086 .1: Could we please get samples IT04S, IT04M, IT04D, IT05S, IT05M, IT05D analysed for

Unfiltered analysis:

300139
ULTRATRACE # 300143.

- Ultra trace dibenzofuran
- Styrene
- Ammonia as N
- Cr III and Cr VI

Filtrate (twice lab filtered and lowest LOR) and Filter Paper Analysis:

- PAHs
- Phenols
- TPH C6 – C36
- BTEX
- Styrene
- Dibenzofuran
- Ammonia as N
- Free and WAD Cyanide
- Metals - Pb, As, Cd, Cr (III and VI), Co, Cu, Hg, Ni, Vn, Zn,

Regards,

Kate McGrath
Professional Scientist

mgt LabMark ENVIRONMENTAL LABORATORIES

ABN – 50 005 085 521 e.mail : mgt@mgtenv.com.au web : www.mgtenv.com.au

Melbourne
3-5 Kingston Town Close
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Phone : +61 3 9564 7055
NATA # 1261 & 1645
Site # 1254 & 14271

Sydney
Unit F6, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Sample Receipt Advice

Company name: **AECOM Aust P/L Sydney**

Contact name: Kate McGrath
Client job number: BARANGAROO ANALYSIS REQUEST
COC number: Not provided
Turn around time: 5 Day
Date received: May 23, 2011
MGT lab reference: **300143**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Organic samples had Teflon liners.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Bd as Cd unless otherwise stated..

Contact notes

If you have any questions with respect to these samples please contact:

Bob Symons on Phone : +61 2 8215 6222 or by e.mail: enviro.sydney@labmark.com.au

Results will be delivered electronically via e.mail to Kate McGrath - kate.mcgrath@aecom.com.

mgt Labmark Sample Receipt

mgt LabMark ENVIRONMENTAL LABORATORIES

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

Melbourne
3-5 Kingston Town Close
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NATA # 1261 & 1645
Site # 1254 & 14271

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Lane Cove West NSW 2066
Phone : +61 2 8215 6222
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600

Company Name: AECOM Aust P/L Sydney
Address: Level 5, 828 Pacific Hwy
Gordon
NSW 2072

Order No.:
Report #: 300143
Phone: (02) 8484 8999
Fax: (02) 8484 8989

Received: May 23, 2011 12:00
Due: May 30, 2011 03:13
Priority: 5 Day
Contact name: Kate McGrath

Client Job No.: BARANGAROO ANALYSIS REQUEST

mgt-LabMark Client Manager: Dan Thompson

Sample Detail					Aluminium (filtered)	Antimony (filtered)	Barium (filtered)	Beryllium (filtered)	Cobalt (filtered)	Manganese (filtered)	Selenium (filtered)	Silver (filtered)	Vanadium (filtered)	Metals M8 filtered	Speciated Phenols	Polyaromatic Hydrocarbons (PAH)
Laboratory where analysis is conducted																
Melbourne Laboratory - NATA Site #1261																
Sydney Laboratory - NATA Site #1645					X	X	X	X	X	X	X	X	X	X	X	X
Sample ID	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
QC645	May 19, 2011		Water (Ultra-trace)	S11-My32646	X	X	X	X	X	X	X	X	X	X	X	X