

Tallawarra Lands Concept Plan
Approval Modification

APPENDIX

J

ENVIRONMENTAL SITE ASSESSMENT

Environmental Site Assessment

Tallawarra Concept
Approval
Modification



Prepared for Bridgehill
(Tallawarra) Pty Ltd
10 November 2017

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Document Information

Prepared for Bridgehill (Tallawarra) Pty Ltd

Project Name Tallawarra Concept Approval Modification

File Reference Report 002 Rev0
Tallawarra Lands
ESA.docx

Job Reference 82017142-02

Date 10 November 2017

Version Number VA

Effective Date 10 November 2017

Date Approved: 10 November 2017

Document History

Version	Effective Date	Description of Revision	Prepared by:	Reviewed by:
V1	31 August 2017	Draft for internal review	Mitch Blencowe	Matthew Tendam
V2	10 November 2017	Final report	Mitch Blencowe	Matthew Tendam

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1 Introduction

1.1 Background

Bridgehill (Tallawarra) Pty Ltd (Bridgehill) has entered into a purchase agreement with Energy Australia over the Northern and Central precincts of the Tallawarra Lands. Bridgehill has engaged Cardno (NSW/ACT) Pty Ltd (Cardno) to prepare a Modification to the Concept Plan approval.

This Environmental Site Assessment (ESA) forms a portion of the Modification request and specifically addresses the Secretary's Environmental Assessment Requirements (SEARs) as detailed in **Section 1.5**, below. For purposes of this ESA, "the site" refers to the Northern and Central precincts of the Tallawarra Lands, the location of the site is illustrated in **Figure 1 of Appendix A**.

1.2 Overview of Modification Proposal

The Tallawarra Lands Concept Plan Approval (Concept Plan) (MP09_0131) provides the overarching requirements of the future residential development that will occur within the Tallawarra Lands. The site underwent rezoning in 2009 after the closure of the former coal fired power plant that was located on the site until 1989. The rezoning utilised the now surplus environmental buffer zone that existed around the former power station to aid in the fulfilment of housing and employment needs in the Illawarra.

Approval for the Concept Plan was granted on 23 May 2013 for a mixed use development including residential, commercial, industrial and retail development, public open space areas, new recreational facilities, environmental management, conservation areas and riparian corridors. Since this approval was granted, the need for housing within the Illawarra has increased and the type of housing stock required has shifted as the demographics of the area changed.

The proposed modification seeks to increase the density of development across the site by changing zone boundaries and minimum lot sizes to meet this increase in demand and changing demographic requirements. The modification also seeks to amend a number of conditions of the original Concept Plan approval to acknowledge changes that have occurred over the four years since the approval was granted, the separation of the Northern and Central precincts from the Southern precinct and the requirements of the first development application.

1.2.1 Tallawarra Lands Concept Plan

The Concept Plan approval (MP09_0131) was granted for the Tallawarra Lands on 23 May 2013. This approval was granted on the land owned by Energy Australia Tallawarra Pty Ltd for a mixed use development comprising of the following;

- > Three residential precincts being Northern, Central and Lakeside; comprising of a total of 1,010 lots
- > A retirement village containing 200 dwellings and a primary school
- > A neighbourhood centre
- > 12 ha of land zoned B6 Enterprise corridor
- > 54 ha of industrial and light industrial land
- > 2.5 ha site for use as a tourist site
- > Road network, foreshore open space, walkways, cycle paths and share paths
- > 360 ha of open space

Specifically, the three precincts are described below and the approved Concept Plan is contained in **Figure 2 of Appendix A**

1.3 Purpose and Objectives

The purpose of the ESA is to assess for potential contamination in portions of the Northern and Central Precincts of the proposed Tallawarra Lands development that were not encompassed in the original Concept

Approval for the mixed use development under Part 3A Concept Plan Application MP09_0131. The modification areas within the Central and Northern Precincts are illustrated in **Figure 3** and **4** of **Appendix A**.

The findings of this report are intended to supplement the previous environmental investigations undertaken at the site and would inform the Environmental Assessment (EA) that will be prepared in support of the modification. The EA will satisfy the conditions provided in the SEARs issued by the Department of Planning and Environment (DP&E), which includes comments from Wollongong City Council and relevant NSW Government agencies such as Sydney Water, NSW Department of Primary Industries, Heritage Council of NSW and the NSW Environment Protection Authority. A summary of the conditions is provided in **Section 1.5**.

The overall objective of this ESA is to address the planning approval requirements provided in the SEARs that are considered relevant to evaluating the potential for contamination in the modified areas of the Northern and Central Precincts.

1.4 Previous Investigations

The site has historically been subject to a number of environmental assessments including but not limited the reports listed below:

- *Geotechnical, Contamination and Groundwater Investigation, Tallawarra Lands*, December 2010, Coffey Environments / Coffey Geotechnics (Coffey, 2010);
- *Contamination Assessment North Shore Precinct, Tallawarra Lands*, March 2011, Coffey Environments (Coffey, 2011a);
- *Register of Hazardous Materials Report, Residences in Northern Precinct, Tallawarra Lands*, March 2011, Coffey Environments / Coffey Geotechnics (Coffey, 2011b);
- *Environmental Assessment Report, Tallawarra Lands Part 3A Concept Plan Application*, August 2011, DFP Planning Consultants (DFP, 2011).

A discussion of the previous investigations is provided in **Section 2.8**.

1.5 Planning Approval Requirements

The proposed Tallawarra Lands development was granted approval in 2013, with the approval subject to a number of conditions. In addition to the existing conditions applicable to the original Concept Approval MP09_0131, conditions were also provided in the SEARs for the Section 75W modification to MP09_0131, including responses from NSW Government agencies and local councils.

The considerations of the planning approval requirements with regard to the supplementary contamination assessment for the modification to Concept Approval are summarised in **Table 1-1** below.

Table 1-1 Planning Approval Requirements

Requirement	Relevance to Report
Secretary's Environmental Assessment Requirements (SEARs)	
Undertake a review of the current hydrogeological setting, with an update of the remediation of contamination within the approved Concept area;	A desktop review of the current hydrogeological setting has been completed and is provided in Section 2 .
Identify whether the proposed additional footprint comprises contaminated land or groundwater contamination and include a detailed description of the soil sampling methodology, any required remediation measures and ongoing site contamination management in accordance with <i>Contaminated Land Management Act 1997</i> (CLM Act) and the <i>Managing Land Contamination: Planning Guidelines</i> ;	This ESA addresses these requirements in Sections 4-6 .
Include an updated investigation of AEC, including: ▪ The potential for contaminants to be present in soil and groundwater in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, duck creek and the receiving waters of Lake Illawarra and measures to address this, including the feasibility of remediation of contaminated soils and/or containment of contamination sources; ▪ Potential for contamination in the vicinity of the Ash Ponds to adversely affect GDEs on the site; ▪ Measures to ensure that the environmental attributes of conservation lands on the site are not adversely impacted upon by soil and groundwater contaminants; ▪ Any risks to human health or the environment; ▪ Recommendations for ongoing management of contaminated groundwater.	This requirement is not considered relevant to this assessment due to the considerable distance between the modification areas and the ash ponds. The ash ponds are not located in the Northern or Central precincts
Provide verification by an auditor accredited under the CLM Act of the adequacy of the above investigation, effectiveness of any proposed remediation, and suitability of the site for the proposed modification in accordance with SEPP 55 – Remediation of Land;	Marc Salmon of Easterly Point Environmental Pty Ltd, a site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site.
Assess and advise on the status of the contamination matters specified in Schedule 3 Future Environmental Assessment Requirements 11 and 12 of the Concept Approval and, if any of those requirements have been triggered, information on their progression;	This requirement has been addressed within this ESA report with respect to the proposed modification areas.

Requirement	Relevance to Report
Agency Comments in Response to SEARs	
<u>Sydney Water</u> None	N/A
<u>Wollongong City Council</u> None	N/A
<u>NSW Department of Primary Industries</u> Undertake a review of the current hydrogeological setting together with an update on the remediation of contamination in the areas nearby and identify whether the proposed additional footprint comprises contaminated land or groundwater contamination and detail any required remediation measures.	This has been addressed with respect to the proposed modification areas, see Sections 5, 6 and 7.
<u>Heritage Council of NSW</u> None	N/A
<u>NSW EPA</u> The Environmental Assessment for the proposed modification should include the following: I. Address the items listed in the draft SEARs document (item 13) <i>"The modification request shall identify how best practice Ecologically Sustainable Development (ESD) principles would be incorporated into the future development"</i> II. Address the contamination matters as listed in the previous EPA correspondence, see below: <i>"The asbestos surface sampling over the site has been undertaken on a 100m grid spacing which is consistent with DECCWs previous recommendations. DECCW seeks a detailed description of the soil sampling methodology in the final EA.</i> <i>In previous correspondence, DECCW has recommended an auditor accredited under the CLM Act 1997 be engaged to verify the adequacy of the investigation, the effectiveness of remediation, and to certify the suitability of the land for its proposed use. The draft EA did not include this commitment and again DECCW recommends a SoC to this effect be incorporated in the final EA.</i> <i>DEECW will review and make a submission on the exhibited EA and contingent upon the inclusions of the above surface sampling methodology and SoC, expects ongoing site contamination matters to be managed in accordance with SEPP 55 – Remediation of Land and the Managing Land Contamination; Planning Guidelines. That is the suitability of the land for the proposed land use, and any remediation required in order to make the</i>	
	This has been addressed with respect to the proposed modification areas. Marc Salmon of Easterly Point Environmental Pty Ltd, a site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site.

Requirement	Relevance to Report
<i>land suitable for such use, should be appropriately considered by the determining authority in accordance with SEPP 55."</i> III. A level of contamination assessment in the expanded residential areas which is consistent with the previous EPA correspondence and Schedule 3 of the Concept Plan Approval. IV. Assess and advise on the status of the contamination matters as specified under Schedule 3 of the Concept Plan Approval. If any of these requirements have been triggered, information should be provided on the progression of these matters	
Concept Approval MP09_0131 Schedule 3 – Future Environmental Assessment Requirements <u>9) Further Investigation of the Areas of Environmental Concern and engagement of a Site Auditor accredited under the CLM Act 1997</u> Future applications that include those lands nominated as areas of AECs in the Coffey Environments Report (December 2010) must be accompanied by a further environmental assessment report. In addition to adopting the recommendations contained in Section 12 of the Coffey Environments Groundwater Modelling Assessment report, the further investigations must consider: ▪ The potential for contaminants present in the soil and groundwater in the vicinity of the ash ponds to be mobilised and transported to the adjacent shallow aquifer, Duck Creek and ultimately to the receiving waters of Lake Illawarra, and measures to address this including the feasibility of remediation of contaminated soils and/or the containment of the sources of contamination. ▪ Measures to ensure that the environmental attributes of conservation lands on the site are not adversely impacted on by contaminants present in the soil and groundwater; ▪ Recommendations for the ongoing management of contaminated groundwater; ▪ The potential for the contamination present in soil and groundwater in the vicinity of the ash ponds to adversely affect groundwater dependent ecosystems on the site; and ▪ Any risks to human health or the environment. Following the completion of the further investigations, the proponent must engage a Site Auditor accredited under the CLM Act 1997 to verify the adequacy of the investigations (and any proposed remediation) and certify that the site is suitable for its proposed use. <u>10) Engagement of a site auditor to verify the adequacy of asbestos soils sampling and asbestos contamination investigations</u>	
	The ash ponds are not located within the site area and are situated at generally down and side hydraulic gradients relative to the Northern and Central precincts. Consideration of groundwater contamination and remediation within the modification areas is limited to a conceptual site model based on a desktop review of background information and the results of the recent soil assessments (see Section 6) Mr Marc Salmon of Easterly Point Environmental Pty Ltd, a site auditor accredited under the Contaminated Land Management Act 1997, has been engaged by Bridgehill to

Requirement	Relevance to Report
The first future application must include a verification from a Site Auditor accredited under the CLM Act 1997 to as to the adequacy of the investigations and asbestos soil sampling undertaken by Douglas Partners (July 2010) and certification of the suitability of the site for the proposed use.	provide audit services during the assessment and remediation of the site.
<u>11) Soil and water management</u> All soil and water management on the site should be undertaken in accordance with the requirements of the “Blue Book”, Landcoms “Soils and Construction” manual. Soil and water management plans, ongoing maintenance and monitoring and reporting requirements shall be provided at construction certificate stage, including those stages relating to bulk earthworks	The potential erosion and sedimentation risk resulting from soil disturbed during the assessment of the modification areas was considered low. Soil bores and test pits were not situated close to waterways or in areas prone to erosion and sedimentation.
Schedule 4 - Statement of Commitments Tallawarra Lands Concept Plan MP09_0131 6) TRUenergy commits to continuing investigations into the AECs identified in the Geotechnical, Contamination and Groundwater Investigation dated 30 July 2010, prepared by Coffey Environments. The AECs to be further investigated are those parts of the site that fall within the proposed development areas. 6a) TRUenergy commits to managing land contamination in accordance with SEPP 55 – Remediation of Land and the Managing Land Contamination: Planning Guidelines. 7a) TRUenergy commits to undertaking any requirements for remediation and management as part of the findings from the further investigations of the AECs 8) TRUenergy commits to implementing the recommendations detailed in the Preliminary Hydrogeological Assessment – Ash Ponds dated 23 November 2010, prepared by Coffey Environments. 9) The recommendations detailed in the Register of Hazardous Materials Report in Residences in Northern Precinct dated 15 March 2010 prepared by Coffey Environments will be implemented.	Previously identified AEC are not located within the footprint of the proposed modification areas. However, the previous investigations have been reviewed to inform the scope of this ESA. Point 6a has been addressed in this ESA report with respect to the assessment of the proposed modification areas.

1.6 Scope

Cardno completed the following scope of work to meet the objectives of the ESA:

- > A review of existing documentation pertaining to the site including:
 - > Historical environmental investigations; and
 - > Existing conditions applicable to the original Concept Approval MP09_0131, conditions provided in the SEARs for the Section 75W modification to MP09_0131, including responses from NSW Government agencies and Wollongong City Council.
- > A detailed site inspection of the proposed modification areas in the Northern and Central precinct. The site inspection focussed on identification of potential sources and areas of environmental concern.
- > An intrusive investigation in the Northern and Central Precinct modification areas which included:
 - Completion of a site specific Energy Australia site induction prior to accessing the site;
 - Completion of a dial-before-you-dig search and locating underground utilities in the assessment areas;
 - Advancement of seven test pits utilising a tracked five-tonne excavator and three soil borings utilising a hand auger in the Northern Precinct;
 - Advancement of six soil borings utilising a hand auger in the Central Precinct;
 - Submission of 34 primary soil samples to a National Association of Testing Authorities (NATA) accredited laboratory for analysis of the following contaminants and parameters:
 - o Total Recoverable Hydrocarbons (TRH) C₆ to C₄₀;
 - o Benzene, toluene, ethylbenzene, total xylenes and naphthalene (BTEXN);
 - o Heavy metals including arsenic, cadmium, total chromium, copper, lead, mercury, nickel, zinc, selenium and boron (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Se and B respectively);
 - o Polycyclic Aromatic Hydrocarbons (PAH);
 - o Organochlorine Pesticides (OCP);
 - o Organophosphate Pesticides (OPP);
 - o Polychlorinated Biphenyls (PCB);
 - o Volatile Organic Compounds (VOC);
 - o Asbestos, presence absence and National Environment Protection (Assessment of Site Contamination) Measure (NEPM) quantification;
 - o Salinity indicators including electrical conductivity and chloride;
 - o Acid sulfate soil (ASS) indicators including pH field screening (pH_f and pH_{fox}) and Suspension Peroxide Oxidation Combined Acidity & Sulfur (SPOCAS) suite
- > Development of a preliminary Conceptual Site Model (CSM) which evaluates potential risks to identified sensitive receptors; and
- > Preparation of this ESA report.

1.7 Guidelines and Legislation

The scope of work outlined above was completed in accordance with the requirements included in the following guidelines and legislation:

- > CRC Care (2011a) *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document*, September 2011;
- > CRC Care (2011b) *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 2: Application Document*, September 2011;
- > NEPC (2013) *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM). National Environment Protection Council (NEPC) 1999, Amendment 2013;
- > NEPC (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM 1999, Amendment 2013;
- > NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998;
- > NSW DECCW (2008) *Waste Classification Guidelines. Part 1: Classifying Waste*. Department of Environment, Climate Change and Water (DECCW) April 2008, Revised December 2009;
- > NSW EPA (1995) *Contaminated Sites Sampling Design Guidelines*. New South Wales Environment Protection Authority (EPA), September 1995;
- > NSW OEH (2011) *Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment & Heritage (OEH), November 1997, Reprinted September 2000, Reprinted August 2011;
- > Standards Australia (2005) Australian Standard AS 4482.1-2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*. Standards Australia, Homebush, NSW; and
- > Standards Australia (1999) Australian Standard AS 4482.2-1999 - *Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW.

2 Site Conditions

2.1 Site Definition

Details for the site are included in **Table 2-1**, below. The modification areas relative to the proposed Tallawarra Lands Development are shown in **Figure 3** and **Figure 4** of **Appendix A**, with the major site features shown on **Figure 2** of **Appendix A**.

Table 2-1 Site Identification

Item	Details
Site Description	Modification areas in the Northern and Central Precincts of the Tallawarra Lands development
Approximate Site Area (ha)	Northern Precinct modification area: 13.4 ha Central Precinct modification area: 7.8 ha
Legal Identification (Lot / Deposited Plan (DP))	Norther Precinct modification area: Lot 31 in DP 1175058 Central Precinct modification area: Lot 15 in DP 1050255, Lot 102 in DP716727 and Lot 1 in DP551658.
Local Government Area	Wollongong City Council
Parish and County	Calderwood, Camden
Current Site Owners	Energy Australia Tallawarra Pty Ltd

2.2 Site Description

2.2.1 Northern Precinct

The Northern Precinct is located to the south of the suburb of Kanahooka and north of the Tallawarra Power Station. The Precinct has frontage to Lake Illawarra and is positioned on the eastern slopes of Mount Brown providing views to the north and east across the lake. The precinct is 110ha in size and has an approved residential density of 310 residential lots. These residential lots will be positioned within the middle section of the site, with foreshore land set aside for public open space and the conservation of existing vegetation on Mount Brown managed through Environmental Management lands on the upper slopes.

This Precinct will be connected to Kanahooka through the extension of the existing Gilba Road, which connects through to Fowlers Road and to the Princes Motorway.

The approved Concept Plan for the Northern Precinct is illustrated on **Figure 3** of **Appendix A**.

2.2.2 Central Precinct

The Central Precinct is located to the south of the residential development of Dapto. It is positioned on the southern slopes of Mount Brown and provides an outlook to the south with views towards Albion Park and Shellharbour. The Precinct is 210 ha in size and is proposed to house 340 standard residential lots, with a further 10 large lots. Additionally, the Precinct will house a neighbourhood centre, which will incorporate a small supermarket, speciality shops, medical centre and child-care centre. Industrial and light industrial land will be included towards the Tallawarra Power Station along the northern side of Yallah Bay Road.

The area is accessed by Yallah Bay Road which provides connection through to the Tallawarra Power Station. Yallah Bay Road connects to the Princes Highway which provides connection to Dapto in the north and Albion Park in the south.

The Central Precinct also included areas south of Yallah Bay Road and north of Duck Creek which are proposed for the development of a 2.5 ha tourism site on the headland at the eastern portion of the site, further industrial land and open space inclusive of sports fields. Note, the area comprising the tourism precinct is the

only area of proposed development south of Yallah Bay Road. This area is not being amended by this Section 75W modification.

The approved Concept Plan for the Central Precinct is illustrated on **Figure 4 of Appendix A**.

An initial inspection of the site was undertaken on 5 May 2017 with photographs from the site included in **Appendix B**. Details of observations made during the site inspection are provided in **Table 2-2**.

Table 2-2 Site Description

Item	Observations
Current Site use	At the time of the inspection the Northern Precinct of the proposed Tallawarra Lands Development was used for grazing of cattle and agistment of horses. The Precinct also contained a residential dwelling. Overhead transmission lines run through the Precinct on an approximate north south alignment, which are connected to the Tallawarra Power Station. At the time of the inspection the Central Precinct of the proposed Tallawarra Lands Development was used for grazing of cattle. The Central Precinct also contains utilities including an underground high pressure gas main and overhead transmission lines that are connected to the Tallawarra Power Station, running on an approximate east west alignment.
Weather conditions	Fair, sunny and no clouds.
Site surface coverings	The site surface covering in the Central and Northern Precincts is predominantly vegetated with grass. Mature trees are scattered across the western portion of the Northern Precinct and a stand of mature trees is situated within the north east corner of the Central Precinct. Photographs of the ground surface covering at both precincts are provided in Photographs 1 to 34 of Appendix B .
Surface soils	Sandy silt
Site cut and fill	Evidence of cut and fill was not observed during the site inspection.
Buildings	Buildings were not present in the modification areas of the Central and Northern Precincts. The only known existing buildings within the proposed Tallawarra Lands Development are located within the western portion of the Northern Precinct. The buildings have been assessed previously and were not inspected or assessed as part of this assessment.
Potential asbestos in building materials	Potential asbestos containing building materials were not observed within the Central and Northern Precinct modification areas.
Manufacturing, industrial or chemical processes and infrastructure	Not observed.
Fuel storage tanks (USTs/ASTs)	Not observed.
Dangerous goods	Not observed.
Solid waste deposition	Not observed.
Liquid waste disposal features	Not observed

Item	Observations
Evidence of previous site investigations	Not observed.
Evidence of land contamination (staining or odours)	Not observed.
Evidence of groundwater contamination	Not observed.
Groundwater use	Not observed.
Vegetation	Vegetation in the Northern Precinct is dominated by grassed grazing land with a scattering of mature trees toward the west. Vegetation in the Central Precinct is dominated by grassed grazing land with a stand of mature trees located in the north eastern corner.
Site fencing	Fencing within the Central and Northern Precincts is comprised of typical agricultural fences constructed of timber and steel fence posts and a mixture of standard and barbed wire strands. Electric fences were observed in the Northern Precinct. A water tank located immediately north east of the Central Precinct is bound by a chain mesh security fence with barbed wire strands across the top.

2.3 Surrounding Land Uses

Vicinity land uses are detailed in **Error! Reference source not found.3** and **Table 2-4** and are illustrated on **Figure 2 of Appendix A**.

Table 2-3 Surrounding Land Use – Northern Precinct

Direction	Land Use or Activity
North	A mixture of open grassland used for grazing livestock and the Lake Illawarra foreshore is situated north of the Northern Precinct, with the low density residential suburb of Kanahooka beyond.
West	The land use to the immediate west of the Northern Precinct is a mixture of remnant bushland and open grassland used for grazing livestock. Low density residential dwellings are located approximately 100m north west.
East	The Lake Illawarra foreshore is situated east of the Northern Precinct.
South	Open grassland used for livestock grazing is situated south of the Northern Precinct. The Energy Australia Tallawarra Power Station located approximately 600m to the south.

Table 2-4 Surrounding Land Use – Central Precinct

Direction	Land Use or Activity
North	The land use to the north of the Central Precinct is a mixture of low density residential dwellings, areas of bush land and two large concrete water tanks.
West	Cormack Avenue is situated west of the Central Precinct with the Princes Motorway further west.
East	Open grassland used for grazing livestock and overhead electrical transmission lines are situated east of the Central Precinct. The Energy Australia Tallawarra Power Station located approximately 500m to the east.

Direction	Land Use or Activity
South	Yallah Bay Road is situated south of the Central Precinct with Duck Creek further south.

2.4 Topography and Drainage

2.4.1 Northern Precinct

The Northern Precinct is situated along a ridge that runs in an east-west direction with a gentle to moderate slope to the north and south of the ridge line. The ridge has an approximate maximum elevation of 40 m AHD with the highest point located in the western portion of the Northern Precinct.

Surface water is inferred to flow consistent with surface contours and drain into unnamed water courses that eventually discharge to Lake Illawarra.

2.4.2 Central Precinct

The topography of the Central Precinct is variable with the northern portion dominated by a moderate to steep slope with a southern aspect that grades into a generally flat ground surface in the vicinity of Yallah Bay Road. The northern portion of the Central Precinct has an approximate maximum elevation of 120 m AHD whilst the low lying area in the southern portion has an approximate elevation of 4 m AHD.

Surface water in the Central Precinct is expected to follow the land topography discharging into several unnamed watercourses and farm dams before flowing into Duck Creek and eventually into Lake Illawarra.

2.5 Flood Potential

The Wollongong City Council online mapping tool, Dekho Public, indicates that the flood potential in the Central Precinct is low with the exception of some low-lying areas immediately north of Yallah Bay Road.

Dekho Public indicates that the Northern Precinct is not at risk of flooding.

2.6 Regional Geology and Hydrogeology

2.6.1 Northern Precinct

The 1:100,000 Kiama Soil Landscape Series Sheet (9028, 1st Edition) (Department of Conservation and Land Management, 1993) indicates that Northern Precinct is comprised of the Shellharbour (erosional) soil landscape.

The 1:50,000 Kiama Geological Series Sheet (9028-1, 1st Edition) (Department of Mines, 1974) indicates that the Northern Precinct is underlain by the Budgong Sandstone, which is characterised by red-brown and grey volcanic sandstone.

2.6.2 Central Precinct

Published geological information contained within the 1:100,000 Kiama Soil Landscape Series Sheet (9028, 1st Edition) (Department of Conservation and Land Management, 1993) indicates that Central Precinct is comprised of the Shellharbour (erosional) soil landscape in the higher elevations and the Fairy Meadow (swamp) soil landscape in the lower lying areas in close proximity to Yallah Bay Road.

The Shellharbour soil landscape is characterised by rolling low hills with long side slopes and broad drainage plains on the Budgong Sandstone with slopes having a gradient of less than 20%.

The Fairy Meadow soil landscape is characterised by alluvial plains, floodplains, valley flats and terraces below the escarpment having a gradient of less than 5%.

Published geological information contained within the 1:50,000 Kiama Geological Series Sheet (9028-1, 1st Edition) (Department of Mines, 1974) indicates that the Central Precinct is underlain by two geological units including Quaternary Alluvium in the lower lying areas and Budgong Sandstone in the higher elevations.

Quaternary Alluvium is characterised by alluvium, gravel, and beach and dune sand. Budgong Sandstone is characterised by red-brown and grey volcanic sandstone.

2.7 Acid Sulphate Soils

The Wollongong City Council online mapping tool, Dekho Public, indicates that the Central and Northern Precincts are classified as Class 4 and Class 5 lands for the potential of ASS. Areas of Class 4 ASS are limited to low lying areas of the Central Precinct in the vicinity of Yallah Bay Road.

Acid sulfate soils in a Class 4 area are likely to be found beyond two metres below the natural ground surface. Any intrusive works that extend beyond two metres below the natural ground surface, or intrusive works which are likely to lower the water table beyond two metres below the natural ground surface may trigger the requirement for assessment possible management.

Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres on adjacent Class 1, 2, 3 or 4 land. Intrusive works in a Class 5 area that are likely to lower the water table below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land may trigger the requirement for assessment and possible management.

2.8 Previous Environmental Reports

The site has historically been subject to a number of environmental assessments relating to contamination that includes but is not limited to:

- *Geotechnical, Contamination and Groundwater Investigation, Tallawarra Lands*, December 2010, Coffey Environments / Coffey Geotechnics (Coffey, 2010);
- *Contamination Assessment North Shore Precinct, Tallawarra Lands*, March 2011, Coffey Environments (Coffey, 2011a);
- *Register of Hazardous Materials Report, Residences in Northern Precinct, Tallawarra Lands*, March 2011, Coffey Environments / Coffey Geotechnics (Coffey, 2011b);
- *Environmental Assessment Report, Tallawarra Lands Part 3A Concept Plan Application*, August 2011, DFP Planning Consultants (DFP, 2011).

Intrusive sampling and analysis completed during historical environmental assessments did not include sample locations within the footprint of the proposed Northern Precinct and Central Precinct modification areas. A summary of the pertinent findings from each report is not considered necessary for this ESA report but will be included in subsequent reports that provide an assessment of the Tallawarra Lands development more broadly.

The Coffey investigation (Coffey, 2010) reports several areas of environmental concern (AEC) that will form the basis of future assessment and remediation for the Tallawarra Lands development. The AEC identified in the report are summarised below including a description of the AEC and the location relative to the Central and Northern Precinct modification areas:

- AEC 1, ash ponds, located outside of the proposed Tallawarra Lands development on the southern side of Yallah Bay Road
- AEC 2, other fill sources of unknown origin and quality, multiple locations within the Northern and Central Precincts but not within the modification areas
- AEC 3, weathering of hazardous building materials, pesticide use, chemical storage, multiple locations within the Northern and Central Precincts but not within the proposed modification areas
- AEC 4, former Heggies contractor area, located outside of the proposed Tallawarra Lands development
- AEC 5, small testing laboratory and coal fired oven, located within the proposed Tallawarra Lands development but not within the Northern and Central Precinct modification areas
- AEC 6, filling and disposal of waste in farm dams or other areas, multiple locations within the Northern and Central Precincts but not within the proposed modification areas
- AEC 7, weed control, location not defined

- AEC 8, oil skimmer area, located within the proposed Tallawarra Lands development but not within the Northern and Central Precinct modification areas
- AEC 9, access road and grassed area, located within the proposed Tallawarra Lands development but not within the Northern and Central Precinct modification areas.

The Coffey report (Coffey, 2010) concludes the following about the broader Tallawarra site:

- *Soil contamination has been identified as part of previous investigations within AEC2, AEC3, AEC4, AEC8 and AEC9, which will require to be further assessed and remediated/managed as part of any later proposed development. It is likely that the contamination is localised to the AEC and associated activity which may have caused the contamination.*
- *Based on the level of data available, it is considered that, in general, the potential for soil contamination to constrain the proposed concept master plan is low. It is considered that further investigation of the identified AECs that fall within the proposed development areas (including any requirements for remediation and management) can be addressed at the time of (or just prior to) any earthworks for subdivision works in these areas.*

Areas outside the designated AECs are not suspected of having had activities that could cause land contamination. In general, further assessment of these areas is not considered to be warranted.

2.9 Area History Summary

Based on a preliminary review of previous reports completed for the site, the historic land uses of the Central and Northern Precinct modification areas is limited to agricultural land use, primarily used for livestock grazing. In addition a number of utilities have been installed through the modification areas including a belowground gas main and aboveground high voltage electrical transmission lines.

A discussion of the surrounding land uses is discussed in **Section 2.3**.

3 Soil Assessment Criteria

3.1 Soil Assessment Criteria

The soil analytical results obtained have been compared to the following assessment criteria. The soil results compared to applicable human health and environmental criteria are presented in **Appendix C**.

- > TRH and BTEXN:
 - NEPM (2013) Soil Health Screening Levels (HSLs) for Vapour Intrusion (VI) for low density residential (HSL A). A review of the logs indicates that the site geology is predominantly clay and silt, therefore the HSL A values for clay and silt are applicable;
 - NEPM (2013) Management Limits for TPH fractions F1 – F4 in soils. A review of the logs indicates that the site geology is predominantly clay and silt, therefore the fine soil texture Management Limits are applicable.
 - CRC Care (2011b) Soil HSLs for VI for Intrusive Maintenance Worker (Shallow Trench). A review of the logs indicate that the clay and silt HSLs are applicable to the site. This criteria is relevant for workers involved in shallow trenches to a maximum trench depth of 1m; and
 - CRC Care (2011b) Soil HSLs for Direct Contact for Intrusive Maintenance Worker
- > Heavy metals, PAHs, OCPs, OPPs and PCBs:
 - NEPM (2013) Health Investigation Level (HILs) for soil contaminants for residential landuse with garden/accessible soil (home grown produce <10% fruit and vegetable intake,(no poultry), includes children's day care centres, preschools and primary schools (HILs A);
- > TRH, BTEX and benzo(a)pyrene:
 - NEPM (2013) Ecological Screening Levels (ESLs) for TPH fractions F1 – F4, BTEX and benzo(a)pyrene for. A review of the bore logs indicates that the fine soil texture ESLs are applicable;
- > As, Cr (III), Cu, DDT, naphthalene, Ni and Zn:
 - NEPM (2013) Generic EILs for As, DDT and naphthalene in soils apply irrespective of the physiochemical properties. Given that the site use and activities have remained consistent for greater than two years the aged EIL criteria were adopted. The EILs were calculated using the NEPM Assessment of Site Contamination (ASC) EIL Calculation Spreadsheet (December 2010). The EIL values for urban residential and public open space were adopted, consistent with the proposed land use. The EIL values for national parks and areas of high conservation were also adopted due to the close proximity of the site to potentially sensitive ecological receptors including Lake Illawarra; and
 - NEPM (2013) Calculated EILs for Cu, Ni and Zn in soils were derived using site specific cation exchange capacity (CEC), % clay and organic carbon content (%OC) data that was obtained through sample collection and laboratory analysis. A total of six soil samples were tested for the above mentioned parameters and the average of each was adopted for the calculation. Given the rural setting at both the Central and Northern Precincts low traffic was selected where applicable. The EILs were calculated with the ASC NEPM EIL Calculation Spreadsheet (December 2010) and copies of each calculation are provided in **Appendix C**. The EIL values for urban residential and public open space were adopted, consistent with the proposed land use. The EIL values for national parks and areas of high conservation were also adopted due to the close proximity of the site to potentially sensitive ecological receptors including Lake Illawarra
- > Acid sulfate soils parameters pHf, pHfox and SPOCAS:
 - Acid Sulfate Soils Assessment Guidelines (NSW Acid Sulfate Soils Management Advisory Committee, 1998).

4 Site Investigation

4.1 Soil Investigation Program

Soil sampling activities were completed over three days by an experienced environmental scientist. The scope and method of the work is summarised in **Table 4-1**. Due to the absence of visible areas of environmental concern soil sample locations were distributed evenly across the areas of expansion proposed within the Central and Northern Precincts.

Soil sampling locations are shown on **Figures 3 and 4 of Appendix A**. Each sample location was located onsite using a handheld GPS with an accuracy of 5m which is acceptable for the level of accuracy necessary for the preparation of figures and this report.

Table 4-1 Investigation Activity Summary

Activity	Details
Dates of Field Activity	Soil sampling in the Central Precinct was completed on 22 nd of May 2017. Soil sampling in the Northern Precinct was completed on 17 th of May and 12 th of July 2017.
Service Location	A DBYD enquiry was submitted on two occasions, DBYD reference 12606740, which showed several services on or near the areas subject to assessment. An underground services locator from Peter Ellsmore and Associates Pty Ltd was contracted to locate and mark services in the proposed areas of excavation to avoid damage to below ground services.
Soil Bore / Test Pit Advancement	As shown on Figures 3 and 4 of Appendix A , a total of six soil bores were completed in the Central Precinct and three soil bores and seven test pits were completed in the Northern Precinct. Hand auger sampling techniques were used due to site constraints with bore advancement and soil sampling by use of mechanical equipment. The nine soil bores were advanced using a hand auger to collect soil samples across the soil profile to 1.0 m below ground level (mbgl). The seven test pits were excavated using a five tonne excavator and the maximum vertical extent of excavation was 2.0 m below ground level.
Soil Logging	Logging of the soil bore / test pits was conducted in general accordance with the Unified Soil Classification System. Soil materials were logged and the following information was recorded in the field: soil/rock type, colour, grain size, sorting, inclusions, moisture conditions, staining and observation of any anthropogenic material (e.g. odours, and waste materials). Soil samples were also screened in the field for visual and olfactory indications of potential contamination and also with a photoionisation detector (PID) to measure volatile organic vapour content A copy of the soil bore / test pit logs are presented in Appendix D .
Soil Sampling	A total of 39 primary soil samples, between the two precincts, were collected during fieldwork and 34 samples were scheduled for analysis of contaminants and parameters of interest. Two intra-laboratory duplicates and two inter-laboratory triplicates were collected and analysed. All primary and intra-laboratory duplicate samples were sent to ALS Environmental for analysis of the contaminants and parameters of interest (see Table 4-3 below). Inter-laboratory triplicate samples were forwarded to Eurofins for analysis. All soil samples were collected in laboratory provided jars by hand whilst wearing disposable nitrile gloves that were replaced following collection of each sample.
Sample Preservation and Transport	Samples were placed in laboratory supplied containers and stored on ice in an esky while on site and in transit to the laboratory under standard Chain of Custody documentation. A laboratory prepared trip spike and trip blank were included in each batch dispatched to the laboratory.
Soil Bore / Test Pit Reinstatement	Soil bores and test pits were reinstated with soil that was excavated during soil sampling. Test pits were track rolled to achieve a level ground surface and the grass removed was replaced at the ground surface.

4.2 Soil Sample Collection

Fieldwork was undertaken by an experienced environmental scientist in accordance with the agreed scope of work, the legislation and guidelines listed in **Section 1.4** and Cardno's Standard Operating Procedures (SOPs). The records and observations made during the fieldwork are presented in the soil bore and test pit logs and fieldwork records presented in **Appendix D** and **E**, respectively.

A summary of the soil samples collected during this assessment are included in **Table 4-2**, below. Soil samples were analysed for the COPCs listed in **Section 1.3**.

Table 4-2 Summary of samples collected

Location	Soil Bore / Test Pit ID	Soil Sample Name	Sample Depth (mbgl)	Date Collected	PID Reading (ppm)	Rationale
Northern Precinct	CHA100	CHA100_0.1	0.1-0.2	17/05/17	0.1	In the absence of visible areas of environmental concern soil bores and test pits were distributed evenly across the Northern Precinct modification area
		CHA100_0.5	0.5-0.6		0.1	
	CTP101	CTP101_0.1	0.1-0.2		0.2	
		CTP101_0.5	0.5-0.6		0.1	
		CTP101_0.9	0.9-1.0		0.1	
	CTP102	CTP102_0.1	0.1-0.2		0.1	
		CTP102_0.5	0.5-0.6		0.1	
	CTP103	CTP103_0.1	0.1-0.2		0.1	
		CTP103_0.5	0.5-0.6		0.2	
		CTP103_0.9	0.9-1.0		0.1	
	CTP104	CTP104_0.1	0.1-0.2	12/07/17	0.1	
		CTP104_0.5	0.5-0.6		0.2	
		CTP104_0.9	0.9-1.0		0.1	
	CTP105	CTP105_0.1	0.1-0.2		0.2	
		CTP105_0.5	0.5-0.6		0.2	
		CTP105_1.0	1.0-1.1		0.1	
		CTP105_1.9	1.9-2.0		0.2	
	CTP106	CTP106_0.1	0.1-0.2		0.3	
		CTP106_0.5	0.5-0.6		0.2	
		CTP106_0.9	0.9-1.0		0.2	
	CHA107	CHA107_0.1	0.1-0.3	22/05/17	0.3	
		CHA107_0.5	0.5-0.7		0.2	
	CHA108	CHA108_0.0	0.0-0.2		0.4	
		CHA108_0.5	0.5-0.7		0.2	
Central Precinct	CHA101	CHA101_0.1	0.1-0.2		0.1	In the absence of visible areas of environmental concern soil bores were dispersed evenly across the Central Precinct modification area
		CHA101_0.5	0.5-0.6		0.0	
	CHA102	CHA102_0.1	0.1-0.2		0.2	
		CHA102_0.5	0.5-0.6		0.1	
		CHA102_0.9	0.9-1.0		0.1	
	CHA103	CHA103_0.1	0.1-0.2		0.1	
		CHA103_0.6	0.6-0.8		0.1	
	CHA104	CHA104_0.1	0.1-0.2		0.1	
		CHA104_0.3	0.3-0.4		0.1	
	CHA105	CHA105_0.1	0.1-0.2		0.1	
		CHA105_0.4	0.4-0.5		0.0	
	CHA106	CHA106_0.1	0.1-0.2		0.2	
		CHA106_0.6	0.6-0.7		0.1	

5 Discussion of Results

5.1 Field Observations

Soil conditions observed during the soil sampling program at the Northern Precinct are summarised in **Table 5-1** and those observed at the Central Precinct are summarised in Error! Reference source not found..

Detailed soil descriptions are provided in the logs in **Appendix D** and photographs of excavated soil from each soil bore and test pit is provided in **Appendix B**.

Table 5-1 Typical Soil Profile – Northern Precinct

Subsurface Horizon	Typical Depth Range (m bgl)	Description
Fill	-	Fill not observed
Natural Soil	0.0 – 0.4	Sandy SILT, low plasticity, brown, fine to medium grained sand
	0.1 – 0.8	Silty CLAY, medium to high plasticity, orange-brown, some sandstone gravel <50 mm
	0.3 – 0.9	Silty SAND, fine to medium grained, brown
Natural Clay	0.2 – 0.8	Gravelly CLAY, medium to high plasticity, orange brown to grey, some sandstone gravel
	0.2 – 0.8	Silty gravelly CLAY, medium to high plasticity, orange-brown mottled grey
Rock	0.8 – 2.0	SANDSTONE, fine to medium grained, brown, extremely weathered Sandstone was encountered at CTP100 to CTP106
Groundwater	-	Groundwater not observed

Table 5-2 Typical Soil Profile – Central Precinct

Subsurface Horizon	Typical Depth Range (m bgl)	Description
Fill	-	Fill not observed
Natural Soil	0.0 – 0.6	Sandy SILT, low plasticity, brown, fine to medium grained sand, with some sandstone gravel and cobbles <80 mm
	0.6 – 0.8	Silty SAND, fine to medium grained, orange brown
Natural Clay	0.4 – 1.0	Silty CLAY, medium plasticity, brown, trace fine to medium grained sand
Rock	0.2 – 1.0	SANDSTONE, coarse grained, brown, extremely weathered Sandstone was encountered in each soil bore within the Central Precinct
Groundwater	-	Groundwater not observed

5.2 Laboratory Analytical Results

Tabulated analytical results are included in **Appendix C**. The results of laboratory analysis have been compared against the adopted assessment criteria detailed in **Section 3**. Laboratory analytical reports and chain of custody documentation are included in **Appendix E**.

- > No COPC were detected at concentrations above the applicable Tier I Screening Guidelines with the exception of copper which was reported above the EIL guidelines in four samples in the Central Precinct and one sample in the Northern Precinct:

- Sample CHA101_0.1 reported a concentration of copper at 100 mg/kg, equal to the site specific EIL guideline for aged contamination in Urban Residential and Public Open Space of 100 mg/kg.
 - Sample CHA102_0.1 reported a concentration of copper at 78 mg/kg, above the site specific EIL guideline for aged contamination in national parks and areas of high conservation value of 45 mg/kg.
 - Sample CHA103_0.1 reported a concentration of copper at 55 mg/kg, above the site specific EIL guideline for aged contamination in national parks and areas of high conservation value of 45 mg/kg.
 - Sample CHA104_0.1 reported a concentration of copper at 48 mg/kg, above the site specific EIL guideline for aged contamination in national parks and areas of high conservation value of 45 mg/kg.
 - Sample CTP105_1.0 reported a concentration of copper at 58 mg/kg, above the site specific EIL guideline for aged contamination in national parks and areas of high conservation value of 45 mg/kg.
- > Multiple soil samples reported a potential acid sulfate soils indicator value that exceeded ASSMAC (1998) indicator value of 1 pH unit.
 - > Sample CHA101_0.5, collected in the Central Precinct, reported a Titratable Peroxide Acidity (TPA) concentration of 21 mole H⁺/t that exceeded the ASSMAC (1998) action criteria for excavation of fine textured soil (>1,000 tonnes) of 18 mole H⁺/t.

5.3 Quality Assurance/Quality Control

The details of overall project QA/QC program including, collection of triplicates, duplicates and field blanks and internal laboratory QA/QC is included in **Appendix E**. The Data Quality Objectives and how they were achieved are also included in **Appendix E**. A summary of the results of the QA/QC results are included in the following sections.

5.3.1 Field QA/QC Evaluation

Table 5-3 summarises the QA/QC samples collected for the Site. Relative percentile differences were calculated and are presented in **Appendix B**.

Table 5-3 Summary of QA/QC samples collected

Parent Sample	Duplicate ID	Triplicate ID
CTP103_0.1	QC100	QC200
CHA104_0.1	QC101	QC201
Trip spike	n/a	n/a
Trip blank_18/05/17	n/a	n/a
Trip blank_22/05/17	n/a	n/a
Trip blank_7/07/17	n/a	n/a
Trip spike_18/05/17	n/a	n/a
Trip spike_23/05/17	n/a	n/a
Trip spike_12/07/07	n/a	n/a

5.3.2 Laboratory QA/QC

The chosen analytical laboratories undertake internal QA/QC procedures which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additionally, laboratory QA/QC procedures include sample receipt, logging, storage, preservation and analysis within the method specified holding time. A review of the laboratory QA/QC procedures indicated that laboratory QA/QC samples percent recoveries were within specified ranges for all samples. Additionally, samples were received and stored appropriately and all samples were analysed within the specified holding time.

5.3.3 Data Useability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of these additional validation works.

It is concluded that overall the quality of the analytical data produced is reliable for the purposes of validating this site for the intended land use.

6 Preliminary Conceptual Site Model

Generally, a CSM provides an assessment of the fate and transport of COPCs relative to site specific, subsurface conditions with regard to their potential risk to human health and the environment. The CSM takes into account site specific factors including:

- > Source(s) of contamination;
- > Identification of COPC associated with past (and present) source(s);
- > Vertical and lateral distribution of COPC;
- > Site specific lithologic information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity; and
- > Actual or potential receptors considering both current and future land use both for the site and adjacent properties, and any sensitive ecological receptors.

Based on the information sourced in this ESA, a Preliminary CSM has been developed and is outlined in **Table 6-1**, below. Additional details are included in the sections that follow as necessary.

Table 6-1 Conceptual Site Model

CSM Element	Description
Site History/Contaminant Sources	Based on the site history summarised in Section 2 , the potential sources of subsurface contamination at the site include uncontrolled filling and solid waste deposition from occupants of the land and waste generated from the Energy Australia Tallawarra Power Station.
Site Current and Future Use	Both the Central and Northern Precinct modification areas are currently used for grazing of cattle. Utilities pass through or near to each area including overhead electrical transmission lines and subsurface high pressure natural gas. The proposed future use of the Central and Northern Precinct is a mixed use development that would include residential, commercial, industrial and retail development, public open space areas, new recreational facilities, environmental management, conservation areas and riparian corridors.
Site Geology	The site geology encountered was variable depending on the topography, however the general geological profile was a topsoil layer of silt underlain by clay with sandstone bedrock at depth.
COPCs – Soil	No COPCs were detected at concentrations above the Tier I screening levels detailed in Section 3 with the exception of copper which exceeded the EIL criteria for urban residential and public open space in one sample and the national parks and areas of high conservation value in four samples.
Extent of Soil Impacts	Soil samples that reported concentrations of copper that exceeded of the NEPM EIL criteria were generally collected from the topsoil layer between surface and 0.2 m bgl, although one exceedance was reported at a depth of 1.0 m bgl. All samples that reported elevated copper in surface soils were collected from the Central Precinct and the sample with elevated copper at 1.0 m bgl was collected from the Northern Precinct.
Potential Human Receptors and Pathways	The current site use of the Central and Northern Precinct modification areas is limited to livestock grazing and the location of aboveground and belowground utilities. As such the potential human receptors are limited to agricultural workers that may come into contact with soil during farming activities and workers completing maintenance on subsurface utilities. The most plausible potentially completed pathway is future site workers may come into contact with contaminants through ingestion of soil during physical contact or inhalation

CSM Element	Description
	of dust, however these are considered low risk due to the absence of COPC at concentrations that exceed the adopted criteria for human health. During construction works, site workers could be exposed to COPCs through dermal exposure, ingestion and/or inhalation. The potential risks associated with exposure to the identified CoPC could generally be managed through standard Occupational, Health and Safety (OHS) measures. Under the future land use as a mixed use development that includes residential, commercial, industrial and recreational / open space, human receptor pathways are plausible, particularly in unpaved areas with accessible soils such as residential lots and park lands. The absence of significant areas of contaminant impact in the modification areas reduces the potential risks to human receptors under the proposed land uses.
Potential Ecological Receptors and Pathways	Notable potential ecological receptors include the foreshore of Lake Illawarra and water bodies including Lake Illawarra and Duck Creek. The potentially completed receptor pathways are groundwater infiltration, surface water runoff and mismanagement of potentially contaminated soil during construction and development of the site.

6.2 CSM Summary and Risk Assessment

As summarised in **Table 6-1** above, there are currently not COPCs present at the Site at concentrations above the Tier I human health or ecological screening values, with the exception of concentrations of copper in five samples that exceed the NEPM EIL guidelines. It is possible that the measured copper concentrations are due to natural background concentrations but this will be evaluated in future stages of the project. Ecological receptors of significance were not identified at or within close proximity of the modification areas. The nearest significant ecological receptors are located outside of the Tallawarra Lands development footprint and the modification areas which include Duck Creek to the south and Lake Illawarra to the east and north. Therefore, the likelihood of a completed pathway is unlikely under the current land use. If soil disturbance and earthworks is required during the proposed redevelopment of the site, potential mismanagement of excavated soil could result in a completed pathway.

6.3 Data Gaps and Uncertainties

6.3.1 Variability and uncertainty

The ESA did not include an investigation of groundwater and as such Cardno cannot make conclusions on the groundwater conditions beneath the site.

6.3.2 Importance of data gaps

The results of the relatively extensive soil sampling program conducted at the Central and Northern Precinct modification areas showed that measurable COPCs are generally absent from the shallow soils except for the areas identified above. This indicates that it is unlikely that groundwater beneath the site is impacted with highly elevated concentrations of COPCs. A groundwater investigation may be necessary if previously unidentified areas of soil impacts are discovered during future phases of work at the site.

7 Conclusions and Recommendations

7.1 Conclusions

Cardno has completed an Environmental Site Assessment (ESA) of the Northern and Central Precinct modification areas of the Tallawarra Lands development. The areas subject to assessment of contamination were previously not assessed during historical site assessments.

The purpose of the ESA is to assess for potential contamination in portions of the Northern and Central Precincts of the proposed Tallawarra Lands development that were not encompassed in the original Concept Approval for the mixed use development under Part 3A Concept Plan Application MP09_0131. The findings of this report are intended to supplement the previous environmental investigations undertaken at the site and would inform the EIS that will be prepared in support of the modification.

During preparation of the ESA, Cardno supervised the advancement three soil borings and seven test pits across the Northern Precinct and six soil borings in the Central Precinct (**Figures 3 and 4 of Appendix A**, respectively).

A total of 34 primary soil samples, collected between the two precincts, were submitted to a NATA accredited laboratory for analysis of a variety of COPCs and physical / geochemical parameters. The laboratory analytical results were compared to the Tier I human health and ecological screening values included in:

- > Schedule B1 of the National Environment Protection (Assessment of Site Contamination) Measure, Amendment 2013 (NEPM, 2013); and
- > Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 2: Application Document (CRC Care, 2011b)

Marc Salmon of Easterly Point Environmental Pty Ltd, a site auditor accredited under the *Contaminated Land Management Act 1997*, has been engaged by Bridgehill to provide audit services during the assessment and remediation of the site.

7.1.1 Summary of Soil Analytical Results

Based on the soil analytical results, soils are impacted with COPCs at concentrations above one of the Tier I screening values as summarised below:

- > One soil sample reported a copper concentration that exceeds the NEPM EIL criteria for urban residential and public open space.
- > Four soil samples reported copper at concentrations that exceed of the NEPM EIL criteria for national parks and areas of high conservation value.
- > Soil samples with elevated concentrations of copper were generally collected from the topsoil layer between surface and 0.2 m bgl, although one exceedance was reported at a depth of 1.0 m bgl.
- > All samples that reported elevated copper in surface soils were collected from the Central Precinct and the sample with elevated copper at 1.0 m bgl was collected from the Northern Precinct.

7.1.2 Preliminary CSM and Risk Assessment

There are currently not COPCs present in the Central and Northern Precinct modification areas at concentrations above the Tier I human health screening values. Potential human receptors in the modification areas are currently limited to farm workers and workers completing maintenance on subsurface utilities.

Copper is present at the site at concentrations above the Tier I ecological screening values. Ecological receptors of significance were not identified at or within close proximity to the modification areas. The nearest significant ecological receptors are located outside of the Tallawarra Lands development footprint and include Duck Creek to the south and Lake Illawarra to the east and north. Therefore, the likelihood of a completed receptor pathway is unlikely under the current land use. If soil disturbance and earthworks is required during the proposed redevelopment of the site, potential mismanagement of excavated soil could result in a completed pathway.

The exceedances of the Tier 1 ecological screening levels were marginally above the criteria and concentrations were relatively consistent across the sampling locations indicating that they may be representative of background concentrations. The overall potential risk to the local environment based on the measured copper concentrations is considered low.

7.2 Recommendations

Given the results of this assessment, Cardno recommends the following:

- > Prior to the works commencing further soil sampling and laboratory analysis of heavy metals should be undertaken in the vicinity of the location of exceedances. The objective of further sampling should be to establish if elevated concentrations of copper are representative of natural background conditions or if the concentrations are more likely resultant from an anthropogenic source / activity.
- > Titratable peroxide acidity was reported in excess of the ASSMAC (1998) action criteria in sample CHA101_0.5. Whilst this is a preliminary indication of potential acid sulfate soils the result should be validated prior to the works commencing with further sampling and analysis as the location of the sample was situated in an area not typically prone to potential acid sulfate soils.
- > Any future works involving soil disturbance should incorporate an unexpected finds protocol to facilitate the identification and management of previously undocumented contamination;
- > Should future soil sampling identify risks to human health or the environment, these should be managed in accordance with the *Contaminated Land Management Act 1997*.

8 Limitations

This assessment has been undertaken in general accordance with the current industry standards for an ESA for the purpose and objectives and scope identified in this report. The standards are set out in the guidelines and regulations listed in **Section 1.7**. The agreed scope of this assessment has been limited for the current purposes of the Client. The assessment may not identify contamination occurring in all areas of the site, or occurring after sampling was conducted. Subsurface conditions may vary considerably away from the sample locations where information has been obtained. This Document has been provided by Cardno subject to the following limitations:

- > This Document has been prepared for the particular purpose outlined in Cardno's proposal and Section 1 of this report and no responsibility is accepted for the use of this Document, in whole or in part, in other contexts or for any other purpose.
- > The scope and the period of Cardno's services are as described in Cardno's proposal, and are subject to restrictions and limitations. Cardno did not perform a complete assessment of all possible conditions or circumstances that may exist at the site referenced in the Document. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Cardno in regards to it.
- > Conditions may exist which were undetectable given the limited nature of the enquiry Cardno was retained to undertake with respect to the site. Variations in conditions may occur between investigatory locations, and there may be special conditions pertaining to the site which have not been revealed by the investigation and which have not therefore been taken into account in the Document. Accordingly, additional studies and actions may be required.
- > In addition, it is recognised that the passage of time affects the information and assessment provided in this Document. Cardno's opinions are based upon information that existed at the time of the production of the Document. It is understood that the services provided allowed Cardno to form no more than an opinion of the actual conditions of the site at the time this Document was prepared and cannot be used to assess the effect of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.
- > Any assessments made in this Document are based on the conditions indicated from published sources and the investigation described. No warranty is included, either express or implied, that the actual conditions will conform exactly to the assessments contained in this Document.
- > Where data supplied by the client or other external sources, including previous site investigation data, have been used, it has been assumed that the information is correct unless otherwise stated. No responsibility is accepted by Cardno for incomplete or inaccurate data supplied by others.
- > Cardno may have retained sub consultants affiliated with Cardno to provide services for the benefit of Cardno. To the maximum extent allowed by law, the Client acknowledges and agrees it will not have any direct legal recourse to, and waives any claim, demand, or cause of action against, Cardno's affiliated companies, and their employees, officers and directors.

This assessment report is not any of the following:

- > A Site Audit Report or Site Audit Statement (SAR/SAS) as defined under the *Contaminated Land Management Act, 1997* or an assessment sufficient for an Environmental Auditor to be able to conclude a SAR/SAS.
- > A geotechnical report and the bore logs/test pit logs may not be sufficient for geotechnical advice.
- > A detailed hydrogeological assessment in conformance with NSW DEC (2007) Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.
- > An assessment of groundwater contaminants potentially arising from other sites or sources nearby.
- > A total assessment of the site to determine suitability of the entire parcel of land at the site for one or more beneficial uses of land.

9 References

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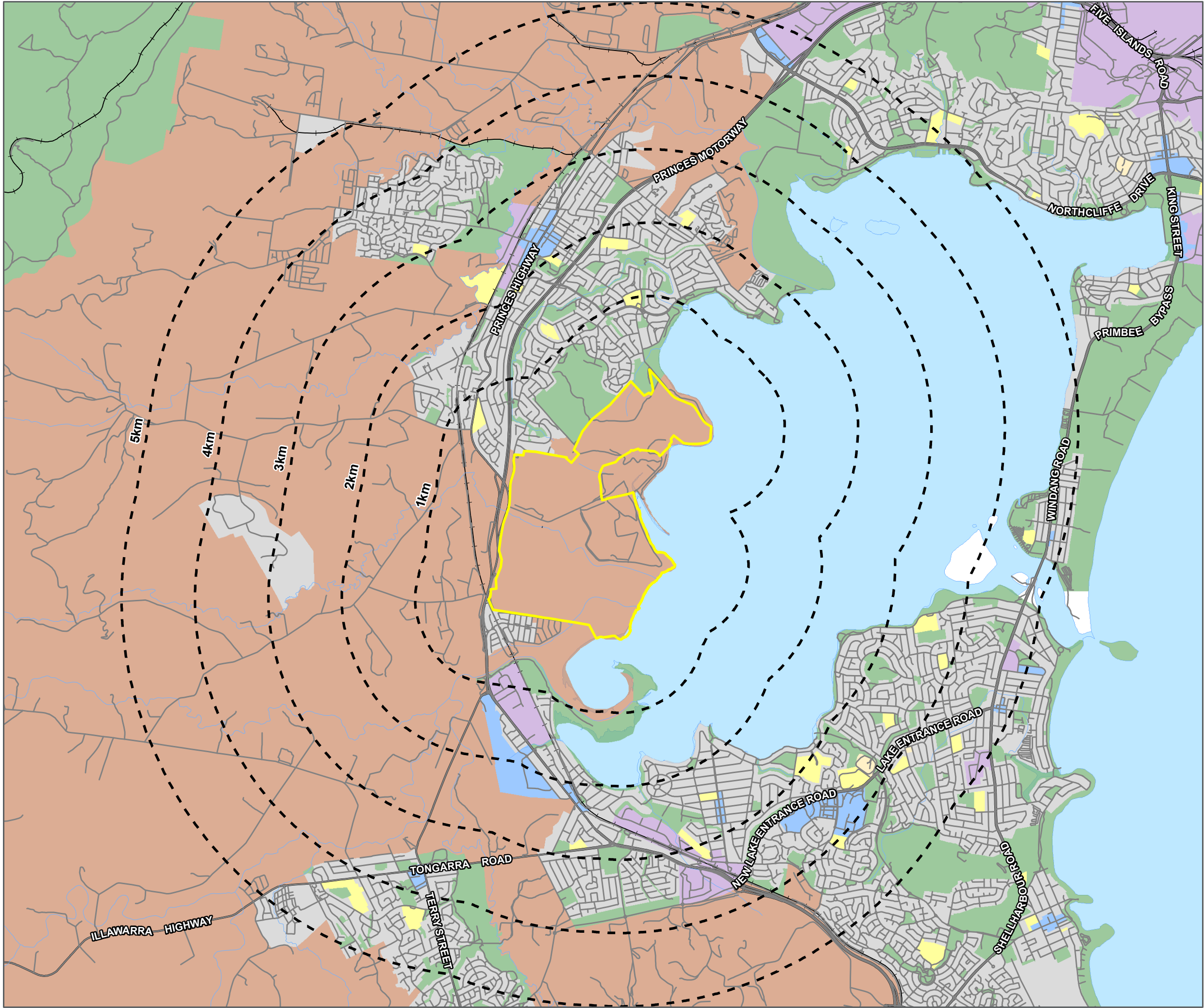
APPENDIX

A

FIGURES

Tallawarra Concept
Approval Modification





Locality Plan

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Railway (LPI)
- Distance Buffer
- Local Roads (LPI)
- Major Roads (LPI)
- Major Watercourses (LPI)

Land Use (ABS, 2011)

- Other
- Commercial
- Education
- Hospital/Medical
- Industrial
- Parkland
- Residential

FIGURE 1

1:50,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-08-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-026-Locality_Plan.mxd 02



Site Plan

TALLAWARRA LANDS

Legend

-  Concept Plan Boundary
-  Lot Layout
-  Watercourses (LPI)
-  Cadastre (DFS1-SS, 2017)
-  Concept Approval Boundary
-  Modification Boundary

FIGURE 2

1:15,000 Scale at A3



Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2017-08-09 | Project: 8201714201
Coordinate System: GDA 1994 MGA Zone 56
Map: 82017142-01-GS-025-Site_Plan.mxd 02
Aerial imagery supplied by nearmap (October, 2016)



Test Location Plan - North Shore Precinct

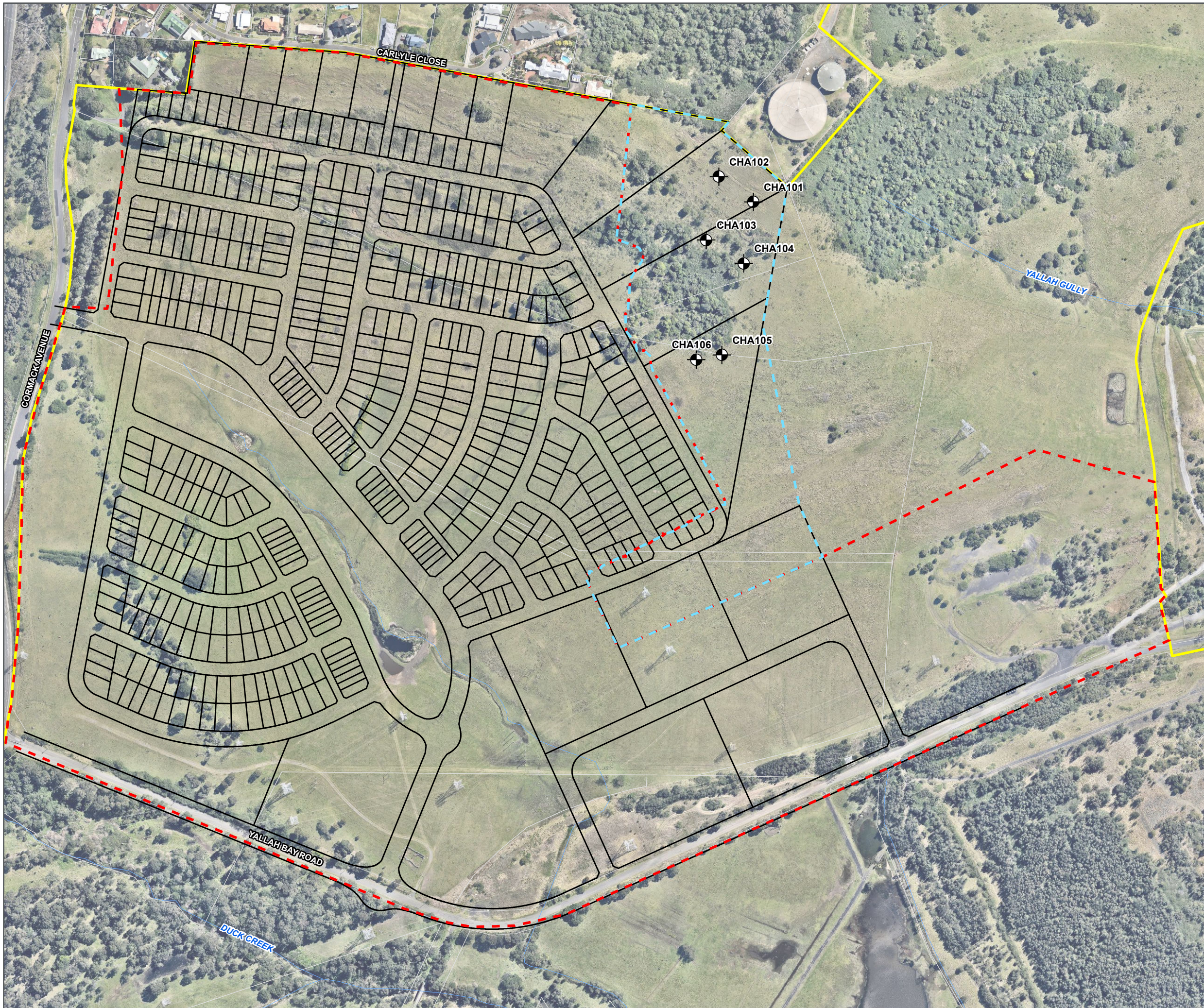
TALLAWARRA LANDS

- Legend**
- Concept Plan Boundary
 - Approximate Hand Auger Location
 - Approximate Test Pit Location
 - Lot Layout
 - Watercourses (LPI)
 - Cadastre (DFSI-SS, 2017)
 - Concept Approval Boundary
 - Modification Boundary

FIGURE 3

1:4,000 Scale at A3





Test Location Plan - Central Precinct

TALLAWARRA LANDS

Legend

- Concept Plan Boundary
- Approximate Hand Auger Location
- Lot Layout
- Watercourses (LPI)
- Cadastre (DFS1-SS, 2017)
- Concept Approval Boundary
- Modification Boundary

FIGURE 4

1:4,000 Scale at A3



APPENDIX

B

PHOTOGRAPHIC
LOG

Tallawarra Concept
Approval Modification





Photograph 1: View of test hole CHA101 location in the central precinct.



Photograph 2: View of soil profile and spoil from CHA101 (central precinct).



Photograph 3: View of test hole CHA102 location in the central precinct.



Photograph 4: View of spoil from CHA102 (central precinct).



Photograph 5: View of test hole CHA103 location in the central precinct.



Photograph 6: View of spoil from CHA103 (central precinct).



Photograph 7: View of test hole CHA104 location in the central precinct.



Photograph 8: View of soil profile of CHA104 (central precinct).



Photograph 9: View of test hole CHA105 location in the central precinct.



Photograph 10: View of spoil from CHA105 (central precinct).



Photograph 11: View of test hole CHA106 location in central precinct.



Photograph 12: View of spoil from CHA106 (central precinct).



Photograph 13: View of spoil from test hole CHA100 (northern precinct).



Photograph 14: View of soil profile of CHA100 (northern precinct).



Photograph 15: View of CHA107 location in foreground (northern precinct).



Photograph 16: View of spoil from CHA107 (northern precinct).



Photograph 17: View of CHA108 location in foreground (northern precinct).



Photograph 18: View of spoil from CHA108 (northern precinct).



Photograph 19: View of soil profile of CTP101 (northern precinct).



Photograph 20: View of spoil from CTP101 (northern precinct).



Photograph 21: View of test hole CTP102 location in the northern precinct.



Photograph 22: View of spoil from CTP102 (northern precinct).



Photograph 23: View of soil profile of CTP103 (northern precinct).



Photograph 24: View of spoil from CTP103 (northern precinct).



Photograph 25: View of soil profile from CTP104 (northern precinct).



Photograph 26: View of spoil from CTP104 (northern precinct).



Photograph 27: View of spoil from CTP105 (northern precinct).



Photograph 28: View of backfilled test pit CTP105 (northern precinct).



Photograph 29: View of soil profile and spoil from CTP106 (northern precinct).



Photograph 30: View of backfilled test pit CTP106 (northern precinct).



Photograph 31: a view of the central precinct modification area looking north



Photograph 32: a view of the northern precinct modification area looking east



Photograph 33: a view of the northern precinct modification area looking east



Photograph 35: a view toward the power station from the northern precinct

APPENDIX

C

LABORATORY RESULTS SUMMARY TABLES

Tallawarra Concept
Approval Modification



	Particle Size	BTEX							TPH					CRC Care TPH Fractions						
	Clay (<2 µm)																			
		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	Total BTEX	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	C10-C16	C16-C34	C34-C40	C10 - C40 (Sum of total)	F1: C6-C10 less BTEX	F2: >C10-C16 less NAPHTHALENE
		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR	1	0.2	0.5	0.5	0.5	0.5	0.5	0.2	10	50	100	100	50	10	50	100	100	50	10	50
NEPM 2013 ESL Urban residential and public open space., Fine Soil - 0-2m		65	105	125			45							120	120	1300	5600			
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m		1100	120,000	85,000			130,000							82,000	62,000	85,000	120,000			
NEPM 2013 Soil HSL A Low Density Residential, for Vapour Intrusion, Silt - 0-1m		0.7	460	NL			110							50	270					
NEPM 2013 Soil HSL A Low Density Residential, for Vapour Intrusion, Silt - 1-2m		0.9	NL	NL			250							75	NL					
NEPM 2013 Management Limits, C/I, Fine Soil									800	1000				800	1000	5000	10,000			

Site	Field ID	Sample Depth	Sampled Date	Lab Report		13	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA100_0.1	0.1	17/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA100_0.3	0.3	18/05/2017	EW1702227 / EB1711815		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA101_0.1	0.1	22/05/2017	EW1702296		22	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
2	CHA101_0.5	0.5	22/05/2017	EW1702296 / EB1711773		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA102_0.1	0.1	22/05/2017	EW1702296		24	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA102_0.5	0.5	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA102_0.9	0.9	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA103_0.1	0.1	22/05/2017	EW1702296		27	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA103_0.6	0.6	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA104_0.1	0.1	22/05/2017	EW1702296		26	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA104_0.3	0.3	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA104_0.3	0.3	22/05/2017	EB1711773		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA105_0.1	0.1	22/05/2017	EW1702296		24	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA105_0.4	0.4	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA106_0.1	0.1	22/05/2017	EW1702296		25	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA106_0.6	0.6	22/05/2017	EW1702296		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA106_0.6	0.6	22/05/2017	EB1711773		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CHA107_0.1	0.1	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA107_0.5	0.5	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CHA108_0.0	0	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP100_0.1	0.1	17/05/2017	EW1702227		32	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP100_0.5	0.5	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP101_0.1	0.1	17/05/2017	EW1702227		18	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP101_0.5	0.5	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP101_0.9	0.9	17/05/2017	EB1711815		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP101_0.9	0.9	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP102_0.1	0.1	17/05/2017	EW1702227		36	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP102_0.5	0.5	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP103_0.1	0.1	17/05/2017	EW1702227		28	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP103_0.5	0.5	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP103_0.9	0.9	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP104_0.1	0.1	17/05/2017	EW1702227		34	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP104_0.5	0.5	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP104_0.9	0.9	18/05/2017	EW1702227		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP105_0.1	0.1	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP105_0.5	0.5	12/07/2017	ES1717236		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	CTP105_1.0	1	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	CTP105_1.9	1.9	12/07/2017	ES1717236		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
002	CTP106_0.1	0.1	12/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	QC100		18/05/2017	EW1702227		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	QC101		22/05/2017	EW1702296		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50
002	QC200		17/05/2017	546937		-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50
002	QC201		22/05/2017	547473		-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	<20	<20	<50	<50	<50	<20	<50	<100	<100	-	<20	<50
002	TRIP BLANK		18/05/2017	EW1702227		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
002	TRIP BLANK		22/05/2017	EW1702296		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
002	TRIP BLANK		7/07/2017	ES1717236		-	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<10	<50	<100	<100	<50	<10	<50	<100	<100	<50	<10	<50

Statistical Summary

Maximum Concentration	36	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<20	<50	<100	<100	<50	<20	<50	<100	<100	<50	<20	<50
Average Concentration	26	0.19	0.47	0.47	0.48	0.47	0.48	0.2	11	47	96	96	50	11	50	100	100	50	11	50
Standard Deviation	6.5	0.028	0.11	0.11	0.083	0.11	0.055	0	2.9	8.6	14	14	0	2.9	0	0	0	0	2.9	0

Prepared by SD, Checked by MB

[illegible]Prepared by SD, Checked by MB

Prepared by SD, Checked by ME

Notes
** denotes highest value adopted from QA/QC duplicate sample
pH _F pH soil in water (field method)
pH _{FOX} pH after oxidation with hydrogen peroxide (field method)
(1) pH values >4 and <5.5 are acid and may be the result of some previous or limited oxidation of sulfides, but is not confirmatory of actual acid sulfate soils
(2) pH readings of pH
(3) The lower the final pH FOX value is, the better the indication of a positive result.
> if the pH FOX < 3 and there was a strong reaction to the peroxide, there is a high level of certainty of a potential acid sulfate soils. The more the pH FOX drops below 3, the more positive the presence of sulfides
> A pH FOX 3-4 is less positive and laboratory analyses are needed to confirm if sulfides are present.
> For pH FOX 4-5 the test is neither positive nor negative. Sulfides may be present either in small quantities and be poorly reactive under quick test field conditions.
> For pH FOX >5 and little or no drop in pH from the field value, little net acid generating ability is indicated
(4) If the pH FOX value is at least one unit below field pH F _i , it may indicate potential acid sulfate soils. The greater the difference between the two measurements, the more indicative the value is of a PASS
(5) Coarse soils comprise sands to loamy sands – Approximate clay content (% < 0.002mm) <5%
(6) Fine soils comprise medium to heavy clays and silty clays – Approximate Clay content (% < 0.002mm) >40%

Table 6 - Solvents Pesticides Polychlorinated Biphenyls

					Solvents							Pesticides					Polychlorinated Biphenyls									
					Methyl Ethyl Ketone	2-hexanone (MBK)	4-Methyl-2-pentanone	Acetone	Allyl chloride	Carbon disulfide	Vinyl acetate	Demeton-S-methyl	Fenamiphos	Parathion	Primiphos-methyl	Primiphos-ethyl	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)		
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
LOR					5	5	5	0.5	0.5	0.5	5	0.05	0.05	0.2	0.2	0.05	0.5	0.1	0.5	0.5	0.5	0.5	0.5	0.1		
NEPM 2013 EIL AES, low pH, CEC, clay content - aged																										
0-2m																										
NEPM 2013 EIL Comm./Ind., low pH, CEC, clay content - aged																										
0-2m																										
NEPM 2013 EIL UR/POS, low pH, CEC, clay content - aged																										
0-2m																										
NEPM 2013 ESL Urban residential and public open space., Fine Soil - 0-2m																										
CRCCARE 2011 Soil HSL for Direct Contact, Intrusive Maintenance Worker 0-1m																										
NEPM 2013 Soil HSL A Low Density Residential, for Vapour Intrusion, Silt - 0-1m																										
NEPM 2013 Soil HSL A Low Density Residential, for Vapour Intrusion, Silt - 1-2m																										
NEPM 2013 Management Limits, C/I, Fine Soil																										
NEPM 2013 HIL, Commercial/Industrial D																								7		
NEPM 2013 HIL, Recreational C																								1		
NEPM 2013 HIL, Residential A																								1		
NEPM 2013 HIL, Residential B																								1		
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value																										
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value																										
ASSMAC (1998) Action Criteria Fine Soil (>1000 tonnes)																										
Site	Field ID	Sample Depth	Sample Date	Lab Report																						
002	CHA100_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA100_0.3	0.3	18/05/2017	EW1702227 / EB1711815	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA101_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
2	CHA101_0.5	0.5	22/05/2017	EW1702296 / EB1711773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA102_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA102_0.5	0.5	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA102_0.9	0.9	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA103_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA103_0.6	0.6	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA104_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA104_0.3	0.3	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA104_0.3	0.3	22/05/2017	EB1711773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA105_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA105_0.4	0.4	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA106_0.1	0.1	22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA106_0.6	0.6	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA106_0.6	0.6	22/05/2017	EB1711773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CHA107_0.1	0.1	12/07/2017	ES1717236	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA107_0.5	0.5	12/07/2017	ES1717236	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CHA108_0.0	0	12/07/2017	ES1717236	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP100_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP100_0.5	0.5	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP101_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP101_0.5	0.5	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP101_0.9	0.9	17/05/2017	EB1711815	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP101_0.9	0.9	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP102_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP102_0.5	0.5	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP103_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP103_0.5	0.5	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP103_0.9	0.9	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP104_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP104_0.5	0.5	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP104_0.9	0.9	18/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP105_0.1	0.1	12/07/2017	ES1717236	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP105_0.5	0.5	12/07/2017	ES1717236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
2	CTP105_1.0	1	12/07/2017	ES1717236	-	-	-	-	-	-	-	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	CTP105_1.9	1.9	12/07/2017	ES1717236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
002	CTP106_0.1	0.1	12/07/2017	ES1717236	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	QC100		18/05/2017	EW1702227	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	QC101		22/05/2017	EW1702296	<5	<5	<5	-	-	<0.5	<5	<0.05	<0.05	<0.2	-	<0.05	-	-	-	-	-	-	-	<0.1		
002	QC200		17/05/2017	546937	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
002	QC201		22/05/2017	547473	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	<0.2	<0.2	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
002	TRIP BLANK		18/05/2017	EW1702227	-	-	-	-	-	-	-	-</														

	pH			SPOCAS																			Chromium Suite	
	pH (F)	pH (Fox)	pH (F) - pH (Fox)	acidity - Acid Reacted Calcium	acidity - Acid Reacted Magnesium	acidity - Excess Acid Neutralising Capacity	acidity - Peroxide Oxidisable Sulfur	ANC Fineness Factor	KCl Extractable Sulfur	Liming Rate	Net Acidity (acidity units)	Net Acidity (sulfur units)	Peroxide Oxidisable Sulfur	pH (KCl)	sulfidic - Acid Reacted Magnesium	sulfidic - Excess Acid Neutralising Capacity	sulfidic - Titratable Actual Acidity	sulfidic - Titratable Peroxide Acidity	sulfidic - Titratable Sulfidic Acidity	Sulfur in Peroxide	Titrratable Peroxide Acidity	Titrratable Sulfidic Acidity	Titrratable Actual Acidity	Liming rate without ANCE
	pH Unit	pH Unit	pH Unit	mole H+/t	mole H+/t	mole H+/t	mole H+/t	FACTOR	%	kg CaCO3/t	mole H+/t	%S	%	PH UNITS	%S	%S	%S	%S	%S	%	mole H+/t	mole H+/t	mole H+/t	kg CaCO3/t
LOR	0.1	0.1	0.1	10	10	10	10	0.5	0.02	1	10	0.02	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	2	2	2	1
ASSMAC (1998) Potential Acid Sulfate Soil Indicator Value	4-5.5(1)	<3 (3)	>1 (4)																					
ASSMAC (1998) Actual Acid Sulfate Soil Indicator Value	<4																							
ASSMAC (1998) Action Criteria Fine Soil (>1000 tonnes)													0.03								18	18		

	Field ID	Sample Depth	Sample Date	Lab Report																									
	002	CHA100_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA100_0.3	0.3	18/05/2017	EW1702227 / EB1711815	6	3.9	2.1	42	<10	146	<10	1.5	<0.02	<1	<10	<0.02	<0.02	7.4	<0.02	0.234	<0.02	<0.02	<0.02	<0.02	<2	<2	<2	<1
	002	CHA101_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	2	CHA101_0.5	0.5	22/05/2017	EW1702296 / EB1711773	6.7	5.4	1.3	<10	<10	-	<10	1.5	<0.02	1	19	0.03	<0.02	4.8	<0.02	-	0.031	0.034	<0.02	<0.02	21	2	19	1
	002	CHA102_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA102_0.5	0.5	22/05/2017	EW1702296	7.4	5.6	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA102_0.9	0.9	22/05/2017	EW1702296	7.7	5.7	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA103_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA103_0.6	0.6	22/05/2017	EW1702296	7	5.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA104_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA104_0.3	0.3	22/05/2017	EW1702296	6.6	4.9	1.7	<10	<10	-	<10	1.5	<0.02	1	16	0.02	<0.02	5	<0.02	-	0.025	0.026	<0.02	<0.02	16	<2	16	1
	002	CHA104_0.3	0.3	22/05/2017	EB1711773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA105_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA105_0.4	0.4	22/05/2017	EW1702296	6.6	5.9	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA106_0.1	0.1	22/05/2017	EW1702296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA106_0.6	0.6	22/05/2017	EW1702296	6.8	5.5	1.3	<10	<10	-	<10	1.5	<0.02	1	15	0.02	<0.02	5.3	<0.02	-	0.024	0.025	<0.02	<0.02	16	<2	15	1
	002	CHA106_0.6	0.6	22/05/2017	EB1711773	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA107_0.1	0.1	12/07/2017	ES1717236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA107_0.5	0.5	12/07/2017	ES1717236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CHA108_0.0	0	12/07/2017	ES1717236	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP100_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP100_0.5	0.5	18/05/2017	EW1702227	7.2	5.3	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP101_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP101_0.5	0.5	18/05/2017	EW1702227	7.1	5.3	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP101_0.9	0.9	17/05/2017	EB1711815	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP101_0.9	0.9	18/05/2017	EW1702227	6.9	4.6	2.3	74	<10	300	<10	1.5	<0.02	<1	<10	<0.02	<0.02	8.2	<0.02	0.48	<0.02	<0.02	<0.02	<0.02	<2	<2	<2	<1
	002	CTP102_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP102_0.5	0.5	18/05/2017	EW1702227	7.8	5.6	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP103_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP103_0.5	0.5	18/05/2017	EW1702227	6.8	5	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP103_0.9	0.9	18/05/2017	EW1702227	7	5.2	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP104_0.1	0.1	17/05/2017	EW1702227	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP104_0.5	0.5	18/05/2017	EW1702227	6.8	5.2	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP104_0.9	0.9	18/05/2017	EW1702227	6.9	5	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	002	CTP105_0.1	0.1	12/07/2017	ES1717236	7.4	3.3	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-</							

Statistical Summary																									
Maximum Concentration	8	5.9	4.1	74	<10	300	<10	1.5	<0.02	1	19	0.03	<0.02	8.2	<0.02	0.48	0.031	0.034	<0.02	<0.02	21	2	19	1	
Average Concentration	7.1	5.1	2	29	10		10	1.5	0.02	1	14	0.022	0.02	6.1	0.02		0.024	0.025	0.02	0.02	11	2	11	1	
Standard Deviation	0.5	0.62	0.67	29	0		0	0	0	0	3.9	0.0045	0	1.6	0		0.0045	0.0057	0	0	8.8	0	8.2	0	

Notes:

"" denotes highest value adopted from QA/QC duplicate sample

pHF pH soil in water (field method)

pHFOX pH after oxidation with hydrogen peroxide (field method)

(1) pH values >4 and <5.5 are acid and may be the result of some previous or limited oxidation of sulfides, but is not confirmatory of actual acid sulfate soils

(2) pH readings of pH

(3) The lower the final pH FOX value is, the better the indication of a positive result.

> if the pH FOX < 3 and there was a strong reaction to the peroxide, there is a high level of certainty of a potential acid sulfate soils. The more the pH FOX drops below 3, the more positive the presence of sulfides

> A pH FOX 3-4 is less positive and laboratory analyses are needed to confirm if sulfides are present.

> For pH FOX 4-5 the test is neither positive nor negative. Sulfides may be present either in small quantities and be poorly reactive under quick test field conditions.

> For pH FOX >5 and little or no drop in pH from the field value, little net acid generating ability is indicated

(4) If the pH FOX value is at least one unit below field pH F, it may indicate potential acid sulfate soils. The greater the difference between the two measurements, the more indicative the value is of a PASS

(5) Coarse soils comprise sands to loamy sands – Approximate clay content (% < 0.002mm) <5%

(6) Fine soils comprise medium to heavy clays and silty clays – Approximate Clay content (% < 0.002mm) >40%

Ⓜ4, indicates that actual acid sulfate soil are present with the sulfides having been oxidised in the past, resulting in acid soil (and soil pore water) conditions.

Site_ID	002	002	002
Field ID	QC300	QC301	QC302
Sampled_Date_Time	18/05/2017	22/05/2017	12/07/2017

Chem_Group	Chem Name	Output Unit	EQL				Statistical Summary		
							Maximum	Average	Standard
	Sum of polycyclic aromatic hydrocarbons	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	0.5	0
BTEX	Benzene	µg/L	1	<1	<1	<1	<1	1	0
	Toluene	µg/L	2	<2	<2	<2	<2	2	0
	Ethylbenzene	µg/L	2	<2	<2	<2	<2	2	0
	Xylene (m & p)	µg/L	2	<2	<2	<2	<2	2	0
	Xylene (o)	µg/L	2	<2	<2	<2	<2	2	0
	Xylene Total	µg/L	2	<2	<2	<2	<2	2	0
	Total BTEX	µg/L	1	<1	<1	<1	<1	1	0
TPH	C6 - C9	µg/L	20	<20	<20	<20	<20	20	0
	C10 - C14	µg/L	50	<50	<50	<50	<50	50	0
	C15 - C28	µg/L	100	<100	<100	<100	<100	100	0
	C29-C36	µg/L	50	<50	<50	<50	<50	50	0
	+C10 - C36 (Sum of total)	µg/L	50	<50	<50	<50	<50	50	0
CRC Care TPH Fractions	C6-C10	µg/L	20	<20	<20	<20	<20	20	0
	C10-C16	µg/L	100	<100	<100	<100	<100	100	0
	C16-C34	µg/L	100	<100	<100	<100	<100	100	0
	C34-C40	µg/L	100	<100	<100	<100	<100	100	0
	C10 - C40 (Sum of total)	µg/L	100	<100	<100	<100	<100	100	0
	F1: C6-C10 less BTEX	µg/L	20	<20	<20	<20	<20	20	0
	F2: >C10-C16 less NAPHTHALENE	µg/L	100	<100	<100	<100	<100	100	0
PAH	BaP TEQ (zero)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	0.5	0
	Benzo(b+j)fluoranthene	µg/L	1	<1	<1	<1	<1	1	0
	Acenaphthene	µg/L	1	<1	<1	<1	<1	1	0
	Acenaphthylene	µg/L	1	<1	<1	<1	<1	1	0
	Anthracene	µg/L	1	<1	<1	<1	<1	1	0
	Benz(a)anthracene	µg/L	1	<1	<1	<1	<1	1	0
	Benzo(a) pyrene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	0.5	0
	Benzo(g,h,i)perylene	µg/L	1	<1	<1	<1	<1	1	0
	Benzo(k)fluoranthene	µg/L	1	<1	<1	<1	<1	1	0
	Chrysene	µg/L	1	<1	<1	<1	<1	1	0
	Dibenz(a,h)anthracene	µg/L	1	<1	<1	<1	<1	1	0
	Fluoranthene	µg/L	1	<1	<1	<1	<1	1	0
	Fluorene	µg/L	1	<1	<1	<1	<1	1	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1	<1	<1	<1	1	0
	Naphthalene	µg/L	1	<1	<1	<1	<1	1	0
	Phenanthrene	µg/L	1	<1	<1	<1	<1	1	0
	Pyrene	µg/L	1	<1	<1	<1	<1	1	0
Metals	Arsenic	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0
	Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0
	Chromium (III+VI)	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0
	Copper	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0
	Lead	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0
	Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0
	Nickel	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	0.001	0
	Zinc	mg/L	0.005	<0.005	<0.005	<0.005	<0.005	0.005	0

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
17.3
Enter soil pH (calcium chloride method) (values from 1 to 14)
4.9
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	110
Urban residential and open public spaces	#NUM!	250
Commercial and industrial	#NUM!	340

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
17.3
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	45
Urban residential and open public spaces	#NUM!	250
Commercial and industrial	#NUM!	420

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
17.3
Enter soil pH (calcium chloride method) (values from 1 to 14)
4.9
Enter organic carbon content (%OC) (values from 0 to 50%)
2.3
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	45
Urban residential and open public spaces	#NUM!	100
Commercial and industrial	#NUM!	140

Tallawarra Lands
Trip Spike Samples

Trip Spike Recoveries (30% - 150% is acceptable)

Lab_Report_Number	Matrix_Type	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable	Result_Type
EW1702227	SOIL	C6 - C9 Fraction	82	111	mg/kg		73 Y	REG
EW1702227	SOIL	C6 - C10 Fraction	95	123	mg/kg		77 Y	REG
EW1702227	SOIL	C6 - C10 Fraction minus BTEX (F1)	47	67	mg/kg		70 Y	REG
EW1702227	SOIL	Benzene	0.4	0.7	mg/kg		57 Y	REG
EW1702227	SOIL	Ethylbenzene	3	3.4	mg/kg		88 Y	REG
EW1702227	SOIL	meta- & para-Xylene	15.8	17.5	mg/kg		90 Y	REG
EW1702227	SOIL	Naphthalene	<1	<1	mg/kg		100 Y	REG
EW1702227	SOIL	ortho-Xylene	6	6.5	mg/kg		92 Y	REG
EW1702227	SOIL	Sum of BTEX	48.1	56.3	mg/kg		85 Y	REG
EW1702227	SOIL	Toluene	22.9	28.2	mg/kg		81 Y	REG
EW1702227	SOIL	Total Xylenes	21.8	24	mg/kg		90 Y	REG
EW1702296	SOIL	Moisture Content	6.8	7.3	%		93 Y	REG
EW1702296	SOIL	C6 - C9 Fraction	55	67	mg/kg		82 Y	REG
EW1702296	SOIL	C6 - C10 Fraction	65	79	mg/kg		82 Y	REG
EW1702296	SOIL	C6 - C10 Fraction minus BTEX (F1)	33	41	mg/kg		80 Y	REG
EW1702296	SOIL	Benzene	0.4	0.4	mg/kg		100 Y	REG
EW1702296	SOIL	Ethylbenzene	2	2.5	mg/kg		80 Y	REG
EW1702296	SOIL	meta- & para-Xylene	10.4	12.3	mg/kg		84 Y	REG
EW1702296	SOIL	Naphthalene	<1	<1	mg/kg		100 Y	REG
EW1702296	SOIL	ortho-Xylene	4.4	5.3	mg/kg		83 Y	REG
EW1702296	SOIL	Sum of BTEX	31.6	37.7	mg/kg		83 Y	REG
EW1702296	SOIL	Toluene	14.4	17.2	mg/kg		83 Y	REG
EW1702296	SOIL	Total Xylenes	14.8	17.6	mg/kg		84 Y	REG
ES1717236	SOIL	C6 - C9 Fraction	53	63	mg/kg		84 Y	REG
ES1717236	SOIL	C6 - C10 Fraction	65	74	mg/kg		87 Y	REG
ES1717236	SOIL	C6 - C10 Fraction minus BTEX (F1)	28	36	mg/kg		77 Y	REG
ES1717236	SOIL	Benzene	0.4	0.5	mg/kg		80 Y	REG
ES1717236	SOIL	Ethylbenzene	2.5	2.5	mg/kg		100 Y	REG
ES1717236	SOIL	meta- & para-Xylene	12	12.1	mg/kg		99 Y	REG
ES1717236	SOIL	Naphthalene	<1	<1	mg/kg		100 Y	REG
ES1717236	SOIL	ortho-Xylene	5.2	5.2	mg/kg		100 Y	REG
ES1717236	SOIL	Sum of BTEX	36.9	37.7	mg/kg		97 Y	REG
ES1717236	SOIL	Toluene	16.8	17.4	mg/kg		96 Y	REG
ES1717236	SOIL	Total Xylenes	17.2	17.3	mg/kg		99 Y	REG

Field Blanks (SOIL)
Filter: Lab_Report_Number in('ES1717236','EB1711773','EW1702296','EW1702227',

Lab Report Number	EW1702227	ES1717236	EW1702296
Field ID	BLANK	Blank	BLANK
Sampled_Date/Time	18/05/2017	7/07/2017	22/05/2017
Sample Type	Field_B	Trip_B	Trip_B

Chem_Group	ChemName	Units	EQL			
	APPROVED IDENTIFIER:	--				
	Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5		0.6	
	Description	--				
	Exchangeable Calcium Percent	%	0.1			
	Exchangeable Magnesium Percent	%	0.1			
	Exchangeable Potassium Percent	%	0.1			
	Magnesium/Potassium Ratio	-	0.1			
	Moisture Content	%	1		3.9	2.3
	Organic Matter %	%w/w	0.5			
	Reaction Rate	COMMENT	1			
	Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5		<0.5	
	Total Soluble Salts	mg/kg	5			
Asbestos	weight of sample	g	0.01			
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2
	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5
	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	0.5	<0.5	<0.5	<0.5
	Xylene (o)	mg/kg	0.5	<0.5	<0.5	<0.5
	Xylene Total	mg/kg	0.5	<0.5	<0.5	<0.5
	Total BTEX	mg/kg	0.2	<0.2	<0.2	<0.2
CRC Care TPH Fractions	C6-C10	mg/kg	10		<10	
	C10-C16	mg/kg	50		<50	
	C16-C34	mg/kg	100		<100	
	C34-C40	mg/kg	100		<100	
	C10 - C40 (Sum of total)	mg/kg	50		<50	
	F1: C6-C10 less BTEX	mg/kg	10		<10	
	F2: >C10-C16 less NAPHTHALENE	mg/kg	50		<50	
Metals	Arsenic	mg/kg	5		<5	
	Boron	mg/kg	50			
	Cadmium	mg/kg	1		<1	
	Chromium (III+VI)	mg/kg	2		3	
	Copper	mg/kg	5		<5	
	Iron	mg/kg	50			
	Lead	mg/kg	5		<5	
	Mercury	mg/kg	0.1		<0.1	
	Nickel	mg/kg	2		<2	
	Selenium	mg/kg	5			
	Zinc	mg/kg	5		<5	
NA	AsbestosType	--				
Organochlorine Pesticides	4,4-DDE	mg/kg	0.05		<0.05	
	a-BHC	mg/kg	0.05		<0.05	
	Aldrin	mg/kg	0.05		<0.05	
	Aldrin + Dieldrin	mg/kg	0.05		<0.05	
	b-BHC	mg/kg	0.05		<0.05	
	chlordan	mg/kg	0.05		<0.05	
	Chlordane (cis)	mg/kg	0.05		<0.05	
	Chlordane (trans)	mg/kg	0.05		<0.05	
	d-BHC	mg/kg	0.05		<0.05	
	DDD	mg/kg	0.05		<0.05	
	DDT	mg/kg	0.2		<0.2	
	DDT+DDE+DDD	mg/kg	0.05		<0.05	
	Dieldrin	mg/kg	0.05		<0.05	
	Endosulfan	mg/kg	0.05		<0.05	
	Endosulfan I	mg/kg	0.05		<0.05	
	Endosulfan II	mg/kg	0.05		<0.05	
	Endosulfan sulphate	mg/kg	0.05		<0.05	
	Endrin	mg/kg	0.05		<0.05	
	Endrin aldehyde	mg/kg	0.05		<0.05	
	Endrin ketone	mg/kg	0.05		<0.05	
	g-BHC (Lindane)	mg/kg	0.05		<0.05	
	Heptachlor	mg/kg	0.05		<0.05	
	Heptachlor epoxide	mg/kg	0.05		<0.05	
	Hexachlorobenzene	mg/kg	0.05		<0.05	
	Methoxychlor	mg/kg	0.2		<0.2	
Organophosphorous Pesticides	Azinophos methyl	mg/kg	0.05		<0.05	
	Bromophos-ethyl	mg/kg	0.05		<0.05	
	Carbophenothion	mg/kg	0.05		<0.05	
	Chlorfenvinphos	mg/kg	0.05		<0.05	
	Chlorpyrifos	mg/kg	0.05		<0.05	
	Chlorpyrifos-methyl	mg/kg	0.05		<0.05	
	Diazinon	mg/kg	0.05		<0.05	
	Dichlorvos	mg/kg	0.05		<0.05	
	Dimethoate	mg/kg	0.05		<0.05	
	Ethion	mg/kg	0.05		<0.05	
	Fenthion	mg/kg	0.05		<0.05	
	Malathion	mg/kg	0.05		<0.05	
	Methyl parathion	mg/kg	0.2		<0.2	
	Monocrotophos	mg/kg	0.2		<0.2	
	Prothiofos	mg/kg	0.05		<0.05	
PAH	BaP TEQ (zero)	mg/kg	0.5		<0.5	
	Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5		1.2	
	Benzo(b+)fluoranthene	mg/kg	0.5		<0.5	
	Acenaphthene	mg/kg	0.5		<0.5	
	Acenaphthylene	mg/kg	0.5		<0.5	
	Anthracene	mg/kg	0.5		<0.5	
	Benz(a)anthracene	mg/kg	0.5		<0.5	
	Benzo(a) pyrene	mg/kg	0.5		<0.5	
	Benzo(g,h,i)perylene	mg/kg	0.5		<0.5	
	Benzo(k)fluoranthene	mg/kg	0.5		<0.5	
	Chrysene	mg/kg	0.5		<0.5	
	Dibenz(a,h)anthracene	mg/kg	0.5		<0.5	
	Fluoranthene	mg/kg	0.5		<0.5	
	Fluorene	mg/kg	0.5		<0.5	
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5		<0.5	
	Naphthalene	mg/kg	0.5	<1	<1	<1
	Phenanthrene	mg/kg	0.5		<0.5	
	Pyrene	mg/kg	0.5		<0.5	
Particle Size	Clay (<2 µm)	%	1			
Pesticides	Demeton-S-methyl	mg/kg	0.05		<0.05	
	Fenamiphos	mg/kg	0.05		<0.05	
	Parathion	mg/kg	0.2		<0.2	
	Pirimphos-ethyl	mg/kg	0.05		<0.05	
pH	pH (F)	pH Unit	0.1			
	pH (Fox)	pH Unit	0.1			
Polychlorinated Biphenyls	PCBs (Sum of total)	mg/kg	0.1		<0.1	
TPH	C6 - C9	mg/kg	10		<10	
	C10 - C14	mg/kg	50		<50	
	C15 - C28	mg/kg	100		<100	
	C29-C36	mg/kg	100		<100	
	+C10 - C36 (Sum of total)	mg/kg	50		<50	

APPENDIX

D

GEOLOGICAL LOGS

Tallawarra Concept
Approval Modification



ENVIRONMENTAL BORE HOLE LOG		
CLIENT : Bridgehill	HOLE NO : CHA100	
PROJECT : Tallawarra Lands	PROJECT REF : 8201714202	
LOCATION : Tallawarra lands	SHEET : 1 OF 1	
EQUIPMENT TYPE : Hand Auger	METHOD : Hand Excavation/Shovel	
DATE EXCAVATED : 17/5/17	LOGGED BY : MB	CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)		

MOISTURE & GROUNDWATER	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING
D - Dry	U - Undisturbed Sample	VS - Very Soft	VL - Very Loose	EL - Extremely low	RS - Residual soil
M - Moist	D - Disturbed Sample	S - Soft	L - Loose	VL - Very low	XW - Extremely weathered
W - Wet	ES - Environmental sample	FC - Firm	MD - Medium Dense	L - Low	DW - Distinctly weathered
OMC - Optimum MC	B - Bulk Disturbed Sample	St - Stiff	D - Dense	M - Medium	SW - Slightly weathered
PL - Plastic Limit	SPT - Standard Penetration Test	VSt - Very Stiff	VD - Very Dense	H - High	FR - Fresh rock
→ - Water seepage/inflow	HP - Hand/Pocket Penetrometer	H - Hard		VH - Very high	
↕ - Water level				EH - Extremely high	

File: 8201714202 CHA100 Page 1 OF 1

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA101
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger

METHOD : Hand Excavation/Shovel

DATE EXCAVATED : 22/5/17

LOGGED BY : MB

CHECKED BY : JMG

LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A 0.20m	0.0			Sandy SILT: low plasticity, brown, fine to medium grained sand	M		rootlets present
	0.50m PID = 0.0PPM, r = 0A 0.60m	0.5			Clayey Sandy SILT: low to medium plasticity, orange to brown	D / M		extremely weathered sandstone
		0.90m			some sandstone gravel from 0.7 m			
		1.0			Test hole CHA101 terminated at 0.90 m			
		1.5			EOH at 0.9 m - refusal on sandstone			
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA102
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger

METHOD : Hand Excavation/Shovel

DATE EXCAVATED : 22/5/17

LOGGED BY : MB

CHECKED BY : JMG

LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.2PPM, r = 0A 0.20m	0.0			Sandy SILT: low plasticity, brown, fine to medium grained sand	M		rootlets present
	0.50m PID = 0.1PPM, r = 0A 0.60m	0.5			Silty CLAY: medium plasticity, brown, with trace sand	D / M		
	0.90m PID = 0.1PPM, r = 0A 1.00m	1.0			Test hole CHA102 terminated at 1.00 m EOH at 1.0 m - refusal on sandstone rock			
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA103
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger METHOD : Hand Excavation/Shovel
DATE EXCAVATED : 22/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A 0.20m	0.0			Sandy SILT, low plasticity, brown, fine to medium grained sand, with some sandstone gravel and cobbles < 80 mm diameter	M		rootlets present
	0.60m PID = 0.1PPM, r = 0A 0.80m	0.5			Silty SAND: fine to medium grained sand, orange-brown	D		
		1.0			Test hole CHA103 terminated at 0.80 m EOH at 0.8 m - refusal on weathered sandstone			
		1.5						
		2.0						

MOISTURE & GROUNDWATER	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING
D - Dry M - Moist W - Wet OMC - Optimum MC PL - Plastic Limit Water seepage/inflow Water level	U - Undisturbed Sample D - Disturbed Sample ES - Environmental sample B - Bulk Disturbed Sample SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	EL - Extremely low VL - Very low L - Low M - Medium H - High VH - Very high EH - Extremely high	RS - Residual soil XW - Extremely weathered DW - Distinctly weathered SW - Slightly weathered FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA104
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger

METHOD : Hand Excavation/Shovel

DATE EXCAVATED : 22/5/17

LOGGED BY : MB

CHECKED BY : JMG

LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A	0.0			Sandy SILT: low plasticity, brown, fine grained sand, with some sandstone gravel and cobbles < 80 mm diameter	M		rootlets present
	0.20m				0.20m SANDSTONE: coarse, brown, extremely weathered			
	0.30m PID = 0.1PPM, r = 0A					D		
	0.40m				0.40m Test hole CHA104 terminated at 0.40 m			
		0.5			EOH at 0.4 m - refusal on sandstone rock			
		1.0						
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA105
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger

METHOD : Hand Excavation/Shovel

DATE EXCAVATED : 22/5/17

LOGGED BY : MB

CHECKED BY : JMG

LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A	0.0			Sandy SILT: low plasticity, brown, fine to medium grained sand, with some sandstone gravel and boulders up to 70 mm diameter	M		rootlets present
	0.20m							
	0.40m PID = 0.0PPM, r = 0A	0.30m			SANDSTONE: coarse, orange-brown, extremely weathered	XW		
	0.50m	0.50m			Test hole CHA105 terminated at 0.50 m EOH at 0.5 m - refusal on sandstone			
		1.0						
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA106
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger METHOD : Hand Excavation/Shovel
DATE EXCAVATED : 22/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Central Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.2PPM, r = 0A 0.20m	0.0			Sandy SILT: low plasticity, brown, fine to medium grained sand, with some gravel and boulders up to 60 mm diameter	M		rootlets and earthworms present to 200 mm
	0.60m PID = 0.1PPM, r = 0A 0.70m	0.5			SANDSTONE: coarse, orange-brown, extremely weathered	D		
		0.80m			Test hole CHA106 terminated at 0.80 m EOH at 0.8 m refusal on sandstone			
		1.0						
		1.5						
		2.0						

MOISTURE & GROUNDWATER	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING
D - Dry M - Moist W - Wet OMC - Optimum MC PL - Plastic Limit Water seepage/inflow Water level	U - Undisturbed Sample D - Disturbed Sample ES - Environmental sample B - Bulk Disturbed Sample SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	EL - Extremely low VL - Very low L - Low M - Medium H - High VH - Very high EH - Extremely high	RS - Residual soil XW - Extremely weathered DW - Distinctly weathered SW - Slightly weathered FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL BORE HOLE LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CHA107
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : Hand Auger METHOD : Hand Excavation/Shovel
DATE EXCAVATED : 12/7/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.3PPM, r = 0A	0.0			Sandy SILT: low plasticity, drak brown	D		rootlets present
	0.30m							
	0.50m PID = 0.2PPM, r = 0A	0.40m			Silty CLAY: medium to high plasticity, orange-brown, with trace sand	D / M		
	0.70m	0.5						
		0.80m			Test hole CHA107 terminated at 0.80 m			
					EOH at 0.8 m - target depth			
		1.0						
		1.5						
		2.0						

MOISTURE & GROUNDWATER	SAMPLES & FIELD TESTS	CONSISTENCY	RELATIVE DENSITY	ROCK STRENGTH	ROCK WEATHERING
D - Dry M - Moist W - Wet OMC - Optimum MC PL - Plastic Limit Water seepage/inflow Water level	U - Undisturbed Sample D - Disturbed Sample ES - Environmental sample B - Bulk Disturbed Sample SPT - Standard Penetration Test HP - Hand/Pocket Penetrometer	VS - Very Soft S - Soft F - Firm St - Stiff VSt - Very Stiff H - Hard	VL - Very Loose L - Loose MD - Medium Dense D - Dense VD - Very Dense	EL - Extremely low VL - Very low L - Low M - Medium H - High VH - Very high EH - Extremely high	RS - Residual soil XW - Extremely weathered DW - Distinctly weathered SW - Slightly weathered FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP100
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 17/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
		0.0			Sandy SILT: low plasticity, brown	M		rootlets and earthworms present to 100 mm
	0.10m PID = 0.1PPM, r = 0A				0.10m Silty CLAY: moderate plasticity, brown			
	0.20m					D / M		
					0.40m Silty CLAY: moderate plasticity, orange-brown, with some sandstone gravel			
	0.50m PID = 0.1PPM, r = 0A	0.5				D / M		
	0.60m							
					0.80m Silty SAND: fine to medium grained, brown			extremely weathered sandstone
	0.80m					D		
	1.00m	1.0			1.00m Test hole CTP100 terminated at 1.00 m EOH at 1.0 m - refusal on sandstone rock			
		1.5						
		2.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP101
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 17/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.2PPM, r = 0A	0.0			Sandy SILT: low plasticity, brown	M		rootlets and earthworms present to 200 mm
	0.20m				0.20m			
	0.50m PID = 0.1PPM, r = 0A	0.5			Silty Gravelly CLAY: medium to high plasticity, orange-brown and mottled light grey, with angular sandstone gravel	D / M		
	0.60m							
	0.90m PID = 0.1PPM, r = 0A				0.80m			
	1.00m	1.0			Gravelly CLAY: low plasticity, light grey, sandstone gravel	M		extremely weathered sandstone
					1.00m			
					Test hole CTP101 terminated at 1.00 m			
					EOH at 1.0 m - refusal on sandstone rock			
		1.5						
		2.0						

MOISTURE & GROUNDWATER
D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶ - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS
U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY
VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY
VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH
EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING
RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP102
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 17/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A	0.0			Sandy SILT: low plasticity, brown	M		rootlets and earthworms present to 200 mm
	0.20m				0.20m Silty Gravelly CLAY: medium to high plasticity, orange-brown, with angular sandstone gravel	D / M		
	0.50m PID = 0.1PPM, r = 0A	0.5			0.50m CLAY: high plasticity, pale grey, mottled orange to brown	M / W		root fibres and decomposing wood matter observed
	0.60m				0.70m Gravelly CLAY: low plasticity, light grey, with sandstone gravel	M		extremely weathered sandstone
					0.80m Test hole CTP102 terminated at 0.80 m EOH at 0.8 m - refusal on sandstone rock			
		1.0						
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
▶ - Water seepage/inflow
▼ - Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP103
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 17/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.1PPM, r = 0A	0.0			Sandy SILT: low plasticity, brown	M		rootlets present
	0.20m				0.20m Silty CLAY: medium to high plasticity, brown	D / M		
	0.50m PID = 0.2PPM, r = 0A	0.5			0.40m Silty Gravelly CLAY: medium to high plasticity, orange-brown and mottled grey, with angular sandstone gravel	D / M		
	0.60m				0.80m CLAY: high plasticity, light grey mottled orange-brown	M		
	0.90m PID = 0.1PPM, r = 0A	1.0			0.90m Gravelly CLAY: low plasticity, light grey, with sandstone gravel	M		extremely weathered sandstone
	1.00m				1.00m Test hole CTP103 terminated at 1.00 m EOH at 1.0 m - refusal on sandstone rock			
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP104
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 17/5/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
		0.0			Sandy SILT: low plasticity, brown	M		rootlets present
		0.30m						
		0.5			Silty CLAY: medium to high plasticity, brown	D / M		
	0.50m PID = 0.2PPM, r = 0A							
	0.60m							
		0.70m			Sandy CLAY: medium to high plasticity, brown mottled orange to brown, with some fine to medium grained angular sandstone gravel	M		
	0.90m PID = 0.1PPM, r = 0A							
	1.00m				Gravelly CLAY: low plasticity, orange-brown and mottled grey, with some sandstone boulders <250 mm	M		extremely weathered sandstone
		1.10m			Test hole CTP104 terminated at 1.10 m EOH at 1.1 m - refusal on sandstone rock			
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP105
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 12/7/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.2PPM, r = 0A 0.20m	0.0			Sandy Gravelly SILT: low plasticity, dark brown with some sandstone gravel	D		rootlets present
	0.50m PID = 0.2PPM, r = 0A 0.60m	0.5			0.30m Silty CLAY: medium plasticity, orange-brown, with trace sand and sandstone gravel (<30 mm)	D / M		
	1.00m PID = 0.2PPM, r = 0A 1.10m	1.0			0.70m Silty CLAY: medium to high plasticity, orange-brown, with trace sand and sandstone gravel (<30 mm)	D / M		
	1.90m PID = 0.1PPM, r = 0A 2.00m	2.0			1.80m SANDSTONE: fine to medium grained, light brown, extremely weathered sandstone, with trace mottled green clay	D / M		

Test hole CTP105 terminated at 2.00 m

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

ENVIRONMENTAL TEST PIT LOG

CLIENT : Bridgehill
PROJECT : Tallawarra Lands
LOCATION : Tallawarra lands

HOLE NO : CTP106
PROJECT REF : 8201714202
SHEET : 1 OF 1

EQUIPMENT TYPE : 5 Tonne Excavator METHOD : Machine Excavation
DATE EXCAVATED : 12/7/17 LOGGED BY : MB CHECKED BY : JMG
LOCATION : Northern Precinct (see drawing for precise location)

GROUND WATER LEVELS	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MATERIAL DESCRIPTION Soil Type, plasticity or particle characteristic, colour Rock Type, grain size, colour Secondary and minor components	MOISTURE / WEATHERING	CONSISTENCY / REL DENSITY / ROCK STRENGTH	STRUCTURE & Other Observations
	0.10m PID = 0.3PPM, r = 0A 0.20m	0.0			Sandy Gravelly SILT: low plasticity, dark brown, with some sandstone gravel	D		rootletes present
	0.50m PID = 0.2PPM, r = 0A 0.60m	0.5			Silty CLAY: medium plasticity, orange-brown, with trace sand	D / M		
	0.90m PID = 0.2PPM, r = 0A 1.00m	1.0			SANDSTONE: fine to medium grained sandstone, light brown, weathered	D		rock becoming fresh, sandstone boulders <400 mm
		1.0			Test hole CTP106 terminated at 1.00 m EOH at 1.0 m - refusal on sandstone			
		1.5						
		2.0						

MOISTURE & GROUNDWATER

D - Dry
M - Moist
W - Wet
OMC - Optimum MC
PL - Plastic Limit
Water seepage/inflow
Water level

SAMPLES & FIELD TESTS

U - Undisturbed Sample
D - Disturbed Sample
ES - Environmental sample
B - Bulk Disturbed Sample
SPT - Standard Penetration Test
HP - Hand/Pocket Penetrometer

CONSISTENCY

VS - Very Soft
S - Soft
F - Firm
St - Stiff
VSt - Very Stiff
H - Hard

RELATIVE DENSITY

VL - Very Loose
L - Loose
MD - Medium Dense
D - Dense
VD - Very Dense

ROCK STRENGTH

EL - Extremely low
VL - Very low
L - Low
M - Medium
H - High
VH - Very high
EH - Extremely high

ROCK WEATHERING

RS - Residual soil
XW - Extremely weathered
DW - Distinctly weathered
SW - Slightly weathered
FR - Fresh rock

See Explanatory Notes for details of abbreviations & basis of descriptions.

CARDNO (NSW/ACT) PTY LTD

APPENDIX

E

FIELD DOCUMENTS

Tallawarra Concept
Approval Modification



PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105901



Air-Met Scientific Pty Ltd
1300 137 067

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

Certificate of Calibration

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

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		98.1ppm

Calibrated by:

Sophie Boler

Calibration date:

18/05/2017

Next calibration due:

17/06/2017

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-105892



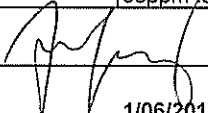
Air-Met Scientific Pty Ltd
1300 137 067

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	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

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

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		98.0ppm

Calibrated by:  Joanna Wong

Calibration date: 1/06/2017

Next calibration due: 1/07/2017

APPENDIX

F

LABORATORY ANALYTICAL REPORTS

Tallawarra Concept
Approval Modification



CERTIFICATE OF ANALYSIS

Work Order	: EB17111773	Page	: 1 of 4
Amendment	: 1		
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division Brisbane
Contact	: Mitch Blencowe	Contact	: Customer Services EB
Address	: PO Box 1285 Level 1, 47 Burelli Street Wollongong 2500	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 02 9496 7700	Telephone	: +61-7-3243 7222
Project	: 8201714201-001-600	Date Samples Received	: 08-Jun-2017 15:16
Order number	: ----	Date Analysis Commenced	: 14-Jun-2017
C-O-C number	: ----	Issue Date	: 30-Jun-2017 14:31
Sampler	: MB		
Site	: ----		
Quote number	: EN/024/16		
No. of samples received	: 3		
No. of samples analysed	: 3		



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- Amendment (30/06/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Mitch Blencowe on 30/06/2017. All analysis results are as per the previous report.
- ASS: EA029 (SPOCAS): Excess ANC not required because pH OX less than 6.5.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m³ in-situ soil, multiply reported results x wet bulk density of soil in t/m³.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.5	CHA104_0.3	CHA106_0.6	----	----
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EB1711773-001	EB1711773-002	EB1711773-003	-----	-----
					Result	Result	Result	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		4.8	5.0	5.3	----	----
pH OX (23B)	----	0.1	pH Unit		5.6	5.9	6.0	----	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		19	16	15	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		21	16	16	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		2	<2	<2	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S		0.031	0.025	0.024	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.02	% pyrite S		0.034	0.026	0.025	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S		<0.020	<0.020	<0.020	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S		<0.020	<0.020	<0.020	----	----
Peroxide Sulfur (23De)	----	0.02	% S		<0.020	<0.020	<0.020	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		<0.020	<0.020	<0.020	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		<10	<10	<10	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.458	0.365	0.254	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca		0.466	0.365	0.254	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca		<0.020	<0.020	<0.020	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		<10	<10	<10	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		<0.020	<0.020	<0.020	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.160	0.070	0.105	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.167	0.070	0.105	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg		<0.020	<0.020	<0.020	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	<10	<10	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		<0.020	<0.020	<0.020	----	----
EA029-H: Acid Base Accounting									
ANC Fineness Factor	----	0.5	-		1.5	1.5	1.5	----	----
Net Acidity (sulfur units)	----	0.02	% S		0.03	0.02	0.02	----	----
Net Acidity (acidity units)	----	10	mole H+ / t		19	16	15	----	----
Liming Rate	----	1	kg CaCO3/t		1	1	1	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.5	CHA104_0.3	CHA106_0.6	----	----
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	----	----
Compound	CAS Number	LOR	Unit		EB1711773-001	EB1711773-002	EB1711773-003	-----	-----
				Result	Result	Result		----	----
EA029-H: Acid Base Accounting - Continued									
Net Acidity excluding ANC (sulfur units)	----	0.02	% S		0.03	0.02	0.02	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t		19	16	15	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t		1	1	1	----	----

Hi EB,

Can you please re-batch the below request?

Regards

Fadi

From: Chloe Leong On Behalf Of ALSEnviro Sydney

Sent: Thursday, 8 June 2017 3:55 PM

To: Fadi Soro <fadi.soro@alsglobal.com>

Cc: Aneta Prosaroski <Aneta.Prosaroski@alsglobal.com>

Subject: FW: RESULTS & EDD & INVOICE for ALS Workorder : EW1702296 | Your Reference: 8201714201-001-600

Hi Fadi,

Can you also arrange this re-batch too? Cheers!

Kind regards,

Chloe Leong

Client Services Officer, Environmental
Sydney



T +61 2 8784 8555

F +61 2 8784 8500

chloe.leong@alsglobal.com

277-289 Woodpark Road
Smithfield, NSW, 2164

Subscribe Training

New ALS office at Crows Nest is now open to receive samples!

EnviroMail™ 00 – Summary of all EnviroMails™ by Category

Right Solutions · Right Partner
www.alsglobal.com

From: Mitch Blencowe [<mailto:mitch.blencowe@cardno.com.au>]

Sent: Thursday, 8 June 2017 3:16 PM

To: Angel-NO-Reply <Angel-NO-Reply@alsglobal.com>; ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>

Subject: RE: RESULTS & EDD & INVOICE for ALS Workorder : EW1702296 | Your Reference: 8201714201-001-600

Hi – please schedule the following samples for sPOCAS testing:

- CTP106_0.5
- CTP109_0.3
- CTP111_0.6

Thanks

Mitch Blencowe

ENVIRONMENTAL SCIENTIST/PROJECT MANAGER
CARDNO

Environmental Division
Brisbane

Work Order Reference

EB1711773



Telephone : + 61-7-3243 7222

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB1711773**

Page : 1 of 4

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Laboratory : Environmental Division Brisbane

Contact : Mitch Blencowe

Telephone : +61-7-3243 7222

Project : 8201714201-001-600

Date Samples Received : 08-Jun-2017

Site : ----

Issue Date : 30-Jun-2017

Sampler : MB

No. of samples received : 3

Order number : ----

No. of samples analysed : 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-B: Acidity Trail								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-C: Sulfur Trail								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-D: Calcium Values								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-E: Magnesium Values								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-F: Excess Acid Neutralising Capacity								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-G: Retained Acidity								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-H: Acid Base Accounting								
80* dried soil (EA029) CHA101_0.5, CHA106_0.6	CHA104_0.3,	22-May-2017	14-Jun-2017	15-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.
Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

QUALITY CONTROL REPORT

Work Order : **EB1711773**

Page : 1 of 5

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Laboratory : Environmental Division Brisbane

Contact : Mitch Blencowe

Contact : Customer Services EB

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61 02 9496 7700

Telephone : +61-7-3243 7222

Project : 8201714201-001-600

Date Samples Received : 08-Jun-2017

Order number : ----

Date Analysis Commenced : 14-Jun-2017

C-O-C number : ----

Issue Date : 30-Jun-2017

Sampler : MB

Site : ----

Quote number : EN/024/16

No. of samples received : 3

No. of samples analysed : 3



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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories

Position

Accreditation Category

Ben Felgendrejeris

Brisbane Acid Sulphate Soils, Stafford, QLD

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

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

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 (%)
EA029-A: pH Measurements (QC Lot: 940935)									
EB1711773-001	CHA101_0.5	EA029: pH KCl (23A)	----	0.1	pH Unit	4.8	4.8	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	5.6	5.6	0.00	0% - 20%
EA029-B: Acidity Trail (QC Lot: 940935)									
EB1711773-001	CHA101_0.5	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.031	0.032	0.00	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	0.034	0.034	0.00	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	19	20	0.00	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	21	21	0.00	0% - 50%
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	2	<2	0.00	No Limit
EA029-C: Sulfur Trail (QC Lot: 940935)									
EB1711773-001	CHA101_0.5	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-D: Calcium Values (QC Lot: 940935)									
EB1711773-001	CHA101_0.5	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.458	0.462	0.920	0% - 20%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.466	0.463	0.503	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-E: Magnesium Values (QC Lot: 940935)									

Page : 3 of 5
 Work Order : EB1711773 Amendment 1
 Client : CARDNO (NSW/ACT)
 Project : 8201714201-001-600



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 (%)
EA029-E: Magnesium Values (QC Lot: 940935) - continued									
EB1711773-001	CHA101_0.5	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.160	0.161	0.00	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.167	0.163	2.55	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-H: Acid Base Accounting (QC Lot: 940935)									
EB1711773-001	CHA101_0.5	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	0.03	0.03	0.00	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.03	0.03	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	19	20	0.00	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	19	20	0.00	No Limit



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

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-A: pH Measurements (QCLot: 940935)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.2 pH Unit	100	70	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	3.4 pH Unit	88.2	70	130
EA029-B: Acidity Trail (QCLot: 940935)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	56 mole H+ / t	101	70	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	170 mole H+ / t	97.1	70	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 940935)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.052 % S	121	70	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.158 % S	81.2	70	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 940935)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.097 % Ca	105	70	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.22 % Ca	97.5	70	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 940935)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.25 % Mg	96.9	70	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.234 % Mg	93.2	70	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-H: Acid Base Accounting (QCLot: 940935)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----



Matrix Spike (MS) Report

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

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

Janene McCall

From: Brenda Hong
Sent: Friday, 9 June 2017 11:42 AM
To: rebatches.brisbane
Cc: Samples Brisbane
Subject: Rebatch EW1702227 | Your Reference: 8201714201

Categories: [Shorty To Log](#)

Hi there, please can you rebatch EW1702227 as per client's email below.

Regards

Brenda Hong
Client Services Co-ordinator, Environmental



T +61 2 8784 8555
F +61 2 8784 8500 D +61 2 8784 8515
brenda.hong@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164
AUSTRALIA

EnviroMail™ 111 – Analysis of VOCs by Thermal Desorption Analysis
EnviroMail™ 110 – Identifying Hidden PFAS Chemicals in Environmental Samples and Firefighting Foams
EnviroMail™ 00 – Summary of all EnviroMails™ by Category

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www.alsglobal.com

From: Mitch Blencowe [<mailto:mitch.blencowe@cardno.com.au>]
Sent: Thursday, 8 June 2017 2:09 PM
To: Angel-NO-Reply <Angel-NO-Reply@alsglobal.com>
Cc: Ronda Carniato <ronda.carniato@alsglobal.com>
Subject: RE: RESULTS & EDD & INVOICE for ALS Workorder : EW1702227 | Your Reference: 8201714201

Hi,

I would like to know if these samples are still within holding time for sPOCAs testing? I assume that they are if the samples are frozen at the lab.

If the samples are within holding time I would like the following samples tested for the sPOCAs suite:

- CTP100_0.3
- CTP102_0.9

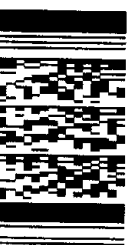
Cheers
Mitch

Mitch Blencowe
ENVIRONMENTAL SCIENTIST/PROJECT MANAGER
CARDNO



Cardno
Shaping the Future

Environmental Division
Brisbane
Work Order Reference
EB17711815



Telephone : + 61-7-3243 7222

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB1711815**

Page : 1 of 4

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Laboratory : Environmental Division Brisbane

Contact : Mitch Blencowe

Telephone : +61-7-3243 7222

Project : 8201714201

Date Samples Received : 08-Jun-2017

Site : ----

Issue Date : 30-Jun-2017

Sampler : Mitch Blencowe

No. of samples received : 2

Order number : ----

No. of samples analysed : 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**



Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA029-A: pH Measurements								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-B: Acidity Trail								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-C: Sulfur Trail								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-D: Calcium Values								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-E: Magnesium Values								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-F: Excess Acid Neutralising Capacity								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-G: Retained Acidity								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓
EA029-H: Acid Base Accounting								
80* dried soil (EA029) CHA100_0.3,	CTP101_0.9	17-May-2017	14-Jun-2017	10-Feb-2020	✓	14-Jun-2017	12-Sep-2017	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	1	5	20.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Suspension Peroxide Oxidation-Combined Acidity and Sulphate	EA029	SOIL	In house: Referenced to Ahern et al 2004 - a suspension peroxide oxidation method following the 'sulfur trail' by determining the level of 1M KCL extractable sulfur and the sulfur level after oxidation of soil sulphides. The 'acidity trail' is followed by measurement of TAA, TPA and TSA. Liming Rate is based on results for samples as submitted and incorporates a minimum safety factor of 1.5.

Preparation Methods	Method	Matrix	Method Descriptions
Drying at 85 degrees, bagging and labelling (ASS)	EN020PR	SOIL	In house

QUALITY CONTROL REPORT

Work Order : **EB1711815**

Page : 1 of 5

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Laboratory : Environmental Division Brisbane

Contact : Mitch Blencowe

Contact : Customer Services EB

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61 02 9496 7700

Telephone : +61-7-3243 7222

Project : 8201714201

Date Samples Received : 08-Jun-2017

Order number : ----

Date Analysis Commenced : 14-Jun-2017

C-O-C number : ----

Issue Date : 30-Jun-2017

Sampler : Mitch Blencowe

Site : ----

Quote number : EN/024/16

No. of samples received : 2

No. of samples analysed : 2



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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories

Position

Accreditation Category

Ben Felgendrejeris

Brisbane Acid Sulphate Soils, Stafford, QLD

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

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 (%)
EA029-A: pH Measurements (QC Lot: 940935)									
EB1711773-001	Anonymous	EA029: pH KCl (23A)	----	0.1	pH Unit	4.8	4.8	0.00	0% - 20%
		EA029: pH OX (23B)	----	0.1	pH Unit	5.6	5.6	0.00	0% - 20%
EA029-B: Acidity Trail (QC Lot: 940935)									
EB1711773-001	Anonymous	EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	0.031	0.032	0.00	No Limit
		EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	0.034	0.034	0.00	No Limit
		EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	<0.020	0.00	No Limit
		EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	19	20	0.00	No Limit
		EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	21	21	0.00	0% - 50%
		EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	2	<2	0.00	No Limit
EA029-C: Sulfur Trail (QC Lot: 940935)									
EB1711773-001	Anonymous	EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-D: Calcium Values (QC Lot: 940935)									
EB1711773-001	Anonymous	EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	0.458	0.462	0.920	0% - 20%
		EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	0.466	0.463	0.503	0% - 20%
		EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-E: Magnesium Values (QC Lot: 940935)									

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 Work Order : EB1711815 Amendment 1
 Client : CARDNO (NSW/ACT)
 Project : 8201714201



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 (%)
EA029-E: Magnesium Values (QC Lot: 940935) - continued									
EB1711773-001	Anonymous	EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	0.160	0.161	0.00	No Limit
		EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	0.167	0.163	2.55	No Limit
		EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	<0.020	0.00	No Limit
		EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	<0.020	0.00	No Limit
		EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	<10	0.00	No Limit
EA029-H: Acid Base Accounting (QC Lot: 940935)									
EB1711773-001	Anonymous	EA029: ANC Fineness Factor	----	0.5	-	1.5	1.5	0.00	No Limit
		EA029: Net Acidity (sulfur units)	----	0.02	% S	0.03	0.03	0.00	No Limit
		EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	0.03	0.03	0.00	No Limit
		EA029: Liming Rate	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	1	1	0.00	No Limit
		EA029: Net Acidity (acidity units)	----	10	mole H+ / t	19	20	0.00	No Limit
		EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	19	20	0.00	No Limit



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

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-A: pH Measurements (QCLot: 940935)								
EA029: pH KCl (23A)	----	0.1	pH Unit	<0.1	4.2 pH Unit	100	70	130
EA029: pH OX (23B)	----	0.1	pH Unit	<0.1	3.4 pH Unit	88.2	70	130
EA029-B: Acidity Trail (QCLot: 940935)								
EA029: Titratable Actual Acidity (23F)	----	2	mole H+ / t	<2	56 mole H+ / t	101	70	130
EA029: Titratable Peroxide Acidity (23G)	----	2	mole H+ / t	<2	170 mole H+ / t	97.1	70	130
EA029: Titratable Sulfidic Acidity (23H)	----	2	mole H+ / t	<2	----	----	----	----
EA029: sulfidic - Titratable Actual Acidity (s-23F)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Peroxide Acidity (s-23G)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029: sulfidic - Titratable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S	<0.020	----	----	----	----
EA029-C: Sulfur Trail (QCLot: 940935)								
EA029: KCl Extractable Sulfur (23Ce)	----	0.02	% S	<0.020	0.052 % S	121	70	130
EA029: Peroxide Sulfur (23De)	----	0.02	% S	<0.020	0.158 % S	81.2	70	130
EA029: Peroxide Oxidisable Sulfur (23E)	----	0.02	% S	<0.020	----	----	----	----
EA029: acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t	<10	----	----	----	----
EA029-D: Calcium Values (QCLot: 940935)								
EA029: KCl Extractable Calcium (23Vh)	----	0.02	% Ca	<0.020	0.097 % Ca	105	70	130
EA029: Peroxide Calcium (23Wh)	----	0.02	% Ca	<0.020	0.22 % Ca	97.5	70	130
EA029: Acid Reacted Calcium (23X)	----	0.02	% Ca	<0.020	----	----	----	----
EA029: acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S	<0.020	----	----	----	----
EA029-E: Magnesium Values (QCLot: 940935)								
EA029: KCl Extractable Magnesium (23Sm)	----	0.02	% Mg	<0.020	0.25 % Mg	96.9	70	130
EA029: Peroxide Magnesium (23Tm)	----	0.02	% Mg	<0.020	0.234 % Mg	93.2	70	130
EA029: Acid Reacted Magnesium (23U)	----	0.02	% Mg	<0.020	----	----	----	----
EA029: Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S	<0.020	----	----	----	----
EA029-F: Excess Acid Neutralising Capacity (QCLot: 940935)								
EA029: Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3	<0.020	----	----	----	----
EA029: acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t	<10	----	----	----	----
EA029: sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S	<0.020	----	----	----	----
EA029-H: Acid Base Accounting (QCLot: 940935)								
EA029: ANC Fineness Factor	----	0.5	-	<0.5	----	----	----	----
EA029: Net Acidity (sulfur units)	----	0.02	% S	<0.02	----	----	----	----



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA029-H: Acid Base Accounting (QCLot: 940935) - continued								
EA029: Net Acidity (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate	----	1	kg CaCO3/t	<1	----	----	----	----
EA029: Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	----	----	----	----
EA029: Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	----	----	----	----
EA029: Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	----	----	----	----

Matrix Spike (MS) Report

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

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

CERTIFICATE OF ANALYSIS

Work Order	: EB1711815	Page	: 1 of 4
Amendment	: 1		
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division Brisbane
Contact	: Mitch Blencowe	Contact	: Customer Services EB
Address	: PO Box 1285 Level 1, 47 Burelli Street Wollongong 2500	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 02 9496 7700	Telephone	: +61-7-3243 7222
Project	: 8201714201	Date Samples Received	: 08-Jun-2017 14:09
Order number	: ----	Date Analysis Commenced	: 14-Jun-2017
C-O-C number	: ----	Issue Date	: 30-Jun-2017 14:25
Sampler	: Mitch Blencowe		
Site	: ----		
Quote number	: EN/024/16		
No. of samples received	: 2		
No. of samples analysed	: 2		



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- **The samples in this work order have been re-batched from EW1702227**
- ASS: EA029 (SPOCAS): Retained Acidity not required because pH KCl greater than or equal to 4.5
- Amendment (30/06/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS. All analysis results are as per the previous report.
- ASS: EA029 (SPOCAS): Liming rate is calculated and reported on a dry weight basis assuming use of fine agricultural lime (CaCO₃) and using a safety factor of 1.5 to allow for non-homogeneous mixing and poor reactivity of lime. For conversion of Liming Rate from kg/t dry weight to kg/m³ in-situ soil, multiply reported results x wet bulk density of soil in t/m³.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA100_0.3	CTP101_0.9	----	----	----
Client sampling date / time					17-May-2017 00:00	17-May-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1711815-001	EB1711815-002	-----	-----	-----
				Result	Result		----	----	----
EA029-A: pH Measurements									
pH KCl (23A)	----	0.1	pH Unit		7.4	8.2	----	----	----
pH OX (23B)	----	0.1	pH Unit		6.9	7.8	----	----	----
EA029-B: Acidity Trail									
Titrateable Actual Acidity (23F)	----	2	mole H+ / t		<2	<2	----	----	----
Titrateable Peroxide Acidity (23G)	----	2	mole H+ / t		<2	<2	----	----	----
Titrateable Sulfidic Acidity (23H)	----	2	mole H+ / t		<2	<2	----	----	----
sulfidic - Titrateable Actual Acidity (s-23F)	----	0.02	% pyrite S		<0.020	<0.020	----	----	----
sulfidic - Titrateable Peroxide Acidity (s-23G)	----	0.02	% pyrite S		<0.020	<0.020	----	----	----
sulfidic - Titrateable Sulfidic Acidity (s-23H)	----	0.02	% pyrite S		<0.020	<0.020	----	----	----
EA029-C: Sulfur Trail									
KCl Extractable Sulfur (23Ce)	----	0.02	% S		<0.020	<0.020	----	----	----
Peroxide Sulfur (23De)	----	0.02	% S		<0.020	<0.020	----	----	----
Peroxide Oxidisable Sulfur (23E)	----	0.02	% S		<0.020	<0.020	----	----	----
acidity - Peroxide Oxidisable Sulfur (a-23E)	----	10	mole H+ / t		<10	<10	----	----	----
EA029-D: Calcium Values									
KCl Extractable Calcium (23Vh)	----	0.02	% Ca		0.320	0.602	----	----	----
Peroxide Calcium (23Wh)	----	0.02	% Ca		0.405	0.751	----	----	----
Acid Reacted Calcium (23X)	----	0.02	% Ca		0.085	0.149	----	----	----
acidity - Acid Reacted Calcium (a-23X)	----	10	mole H+ / t		42	74	----	----	----
sulfidic - Acid Reacted Calcium (s-23X)	----	0.02	% S		0.068	0.119	----	----	----
EA029-E: Magnesium Values									
KCl Extractable Magnesium (23Sm)	----	0.02	% Mg		0.044	0.111	----	----	----
Peroxide Magnesium (23Tm)	----	0.02	% Mg		0.050	0.117	----	----	----
Acid Reacted Magnesium (23U)	----	0.02	% Mg		<0.020	<0.020	----	----	----
Acidity - Acid Reacted Magnesium (a-23U)	----	10	mole H+ / t		<10	<10	----	----	----
sulfidic - Acid Reacted Magnesium (s-23U)	----	0.02	% S		<0.020	<0.020	----	----	----
EA029-F: Excess Acid Neutralising Capacity									
Excess Acid Neutralising Capacity (23Q)	----	0.02	% CaCO3		0.730	1.50	----	----	----
acidity - Excess Acid Neutralising Capacity (a-23Q)	----	10	mole H+ / t		146	300	----	----	----
sulfidic - Excess Acid Neutralising Capacity (s-23Q)	----	0.02	% S		0.234	0.480	----	----	----



Analytical Results

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

Client sample ID

				CHA100_0.3	CTP101_0.9	----	----	----
Client sampling date / time				17-May-2017 00:00	17-May-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1711815-001	EB1711815-002	-----	-----	-----
Result				Result	Result	----	----	----

EA029-F: Excess Acid Neutralising Capacity - Continued

EA029-H: Acid Base Accounting

ANC Fineness Factor	----	0.5	-	1.5	1.5	----	----	----
Net Acidity (sulfur units)	----	0.02	% S	<0.02	<0.02	----	----	----
Net Acidity (acidity units)	----	10	mole H+ / t	<10	<10	----	----	----
Liming Rate	----	1	kg CaCO3/t	<1	<1	----	----	----
Net Acidity excluding ANC (sulfur units)	----	0.02	% S	<0.02	<0.02	----	----	----
Net Acidity excluding ANC (acidity units)	----	10	mole H+ / t	<10	<10	----	----	----
Liming Rate excluding ANC	----	1	kg CaCO3/t	<1	<1	----	----	----

CHAIN OF CUSTODY

FOR LABORATORY USE ONLY (Circle)				STANDARD TURNAROUND			
CLIENT: Cardio				X Standard TAT (List due date):			
OFFICE: Level 1, 47 Burell St Wollongong NSW 2500				Non Standard or urgent TAT (List due date):			
PROJECT: 8201714202-001-600				EN-324-15			
ORDER NUMBER:				QUOTE NO.:			
PROJECT MANAGER: Mitch Blencowe				CONTACT PH: 0475 354 778			
SAMPLER: MB				SAMPLER MOBILE:			
COC emailed? (YES / NO)				EDD FORMAT (or default):			
Email Reports to (will default to PM if no other addresses are listed):				Email Reports to (will default to PM if no other addresses are listed):			
Email Invoice to (will default to PM if no other addresses are listed):				Email Invoice to (will default to PM if no other addresses are listed):			
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ASS Field Screening to be tested from single ziplock bag; Contaminants to be tested from jars				RELINQUISHED BY: <u>MB</u> DATE/TIME: <u>330pm 12/7/17</u>			
RELINQUISHED BY: <u>MB</u> DATE/TIME: <u>330pm 12/7/17</u>				RELINQUISHED BY: <u>MB</u> DATE/TIME: <u>330pm 12/7/17</u>			
LAB USE ONLY		SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED INCLUDING SUITES (NB. Suite Codes must be listed to attract suite price)	
MATRIX: Solid(S) Water(W)		MATRIX: Solid(S) Water(W)		MATRIX: Solid(S) Water(W)		MATRIX: Solid(S) Water(W)	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	Suite S-16 (TRH (C6-C9), BTXN plus F1)	Suite S-18 (TRH (C6-C9), BTXN plus F1)	Suite P-22 (NEM Screen for Soil Classification: Fe, CEC, pH(CaCl2), TOC, Clay Content)
1	CTP105_0.1	12/07/2017	Soil	1 x jars; 2 x zip-lock bags	X		
2	CTP105_0.5	12/07/2017	Soil	1 x jars; 1 x zip-lock bags			
3	CTP105_1.0	12/07/2017	Soil	1 x jars; 1 x zip-lock bags	X		
4	CTP105_1.9	12/07/2017	Soil	1 x jars; 1 x zip-lock bags			
5	CTP106_0.1	12/07/2017	Soil	1 x jars; 1 x zip-lock bags	X		
6	CTP106_0.5	12/07/2017	Soil	1 x jar			
7	CTP106_0.9	12/07/2017	Soil	1 x jar			
8	CHA107_0.1	12/07/2017	Soil	1 x jars; 1 x zip-lock bags	X		
9	CHA107_0.5	12/07/2017	Soil	1 x jar	X		
10	CHA108_0.0	12/07/2017	Soil	1 x jars; 1 x zip-lock bags	X		
11	CHA108_0.5	12/07/2017	Soil	1 x jar	X		
12	QC302	12/07/2017	Water	4 x bottles			
13	Blank		Soil	1 x jar			
14	Trip Spike		Soil	1 x jar			
Trip spike Control							
TOTAL							

Environmental Division
Sydney
Work Order Reference
ES1717236



Telephone : + 61-2-9784 8656

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc:

Place jar on hold

Please forward to Eurofins for analysis

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1717236	Page	: 1 of 11
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division Sydney
Contact	: Mitch Blencowe	Telephone	: +61-2-8784 8555
Project	: 8201714202-001-600	Date Samples Received	: 12-Jul-2017
Site	: ----	Issue Date	: 20-Jul-2017
Sampler	: MB	No. of samples received	: 15
Order number	: ----	No. of samples analysed	: 12

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	10	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010) CTP105_0.1, CTP106_0.1, CHA107_0.5, CTP105_1.0, CHA107_0.1, CHA108_0.0	12-Jul-2017	14-Jul-2017	19-Jul-2017	✓	14-Jul-2017	11-Aug-2017	✓
EA037: Ass Field Screening Analysis							
Snap Lock Bag - frozen (EA037) CTP105_0.1, CTP105_1.0, CTP105_0.5, CTP105_1.9	12-Jul-2017	18-Jul-2017	08-Jan-2018	✓	18-Jul-2017	08-Jan-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) Blank	07-Jul-2017	----	----	----	17-Jul-2017	21-Jul-2017	✓
Soil Glass Jar - Unpreserved (EA055) CTP105_0.1, CTP106_0.1, CHA107_0.5, CTP105_1.0, CHA107_0.1, CHA108_0.0	12-Jul-2017	----	----	----	17-Jul-2017	26-Jul-2017	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200) CTP105_0.1, CHA107_0.1, CTP106_0.1, CHA108_0.0	12-Jul-2017	----	----	----	17-Jul-2017	08-Jan-2018	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED045G: Chloride by Discrete Analyser								
Soil Glass Jar - Unpreserved (ED045G)		12-Jul-2017	14-Jul-2017	09-Aug-2017	✔	17-Jul-2017	11-Aug-2017	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)		07-Jul-2017	17-Jul-2017	03-Jan-2018	✔	17-Jul-2017	03-Jan-2018	✔
Blank								
Soil Glass Jar - Unpreserved (EG005T)		12-Jul-2017	17-Jul-2017	08-Jan-2018	✔	17-Jul-2017	08-Jan-2018	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)		07-Jul-2017	17-Jul-2017	04-Aug-2017	✔	17-Jul-2017	04-Aug-2017	✔
Blank								
Soil Glass Jar - Unpreserved (EG035T)		12-Jul-2017	17-Jul-2017	09-Aug-2017	✔	17-Jul-2017	09-Aug-2017	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
Blank								
Soil Glass Jar - Unpreserved (EP066)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
Blank								
Soil Glass Jar - Unpreserved (EP068)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
EP068B: Organophosphorus Pesticides (OP)								
Soil Glass Jar - Unpreserved (EP068)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
Blank								
Soil Glass Jar - Unpreserved (EP068)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✔	18-Jul-2017	23-Aug-2017	✔
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074A: Monocyclic Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074B: Oxygenated Compounds								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074C: Sulfonated Compounds								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074D: Fumigants								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074E: Halogenated Aliphatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074F: Halogenated Aromatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074G: Trihalomethanes								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP074H: Naphthalene								
Soil Glass Jar - Unpreserved (EP074) CTP105_0.1, CTP106_0.1, CHA107_0.1, CHA108_0.0		12-Jul-2017	14-Jul-2017	19-Jul-2017	✔	17-Jul-2017	19-Jul-2017	✔
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) Blank		07-Jul-2017	14-Jul-2017	21-Jul-2017	✔	17-Jul-2017	23-Aug-2017	✔
Soil Glass Jar - Unpreserved (EP075(SIM)) CTP105_0.1, CTP105_1.0, CTP106_0.1, CHA107_0.1, CHA107_0.5, CHA108_0.0		12-Jul-2017	14-Jul-2017	26-Jul-2017	✔	17-Jul-2017	23-Aug-2017	✔



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✓	17-Jul-2017	23-Aug-2017	✓
Blank								
Soil Glass Jar - Unpreserved (EP080)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✓	18-Jul-2017	21-Jul-2017	✓
Blank,	Trip Spike,							
Trip Spike Control								
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	18-Jul-2017	26-Jul-2017	✓
CTP105_1.0,	CHA107_0.5							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✓	17-Jul-2017	23-Aug-2017	✓
Blank								
Soil Glass Jar - Unpreserved (EP080)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✓	18-Jul-2017	21-Jul-2017	✓
Blank,	Trip Spike,							
Trip Spike Control								
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓
CTP105_0.1,	CTP105_1.0,							
CTP106_0.1,	CHA107_0.1,							
CHA107_0.5,	CHA108_0.0							
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	18-Jul-2017	26-Jul-2017	✓
CTP105_1.0,	CHA107_0.5							
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080)		07-Jul-2017	14-Jul-2017	21-Jul-2017	✓	18-Jul-2017	21-Jul-2017	✓
Blank,	Trip Spike,							
Trip Spike Control								
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓
CTP105_0.1,	CTP106_0.1,							
CHA107_0.1,	CHA108_0.0							
Soil Glass Jar - Unpreserved (EP080)		12-Jul-2017	14-Jul-2017	26-Jul-2017	✓	18-Jul-2017	26-Jul-2017	✓
CTP105_1.0,	CHA107_0.5							

Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC302	12-Jul-2017	14-Jul-2017	08-Jan-2018	✓	14-Jul-2017	08-Jan-2018	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC302	12-Jul-2017	----	----	----	14-Jul-2017	09-Aug-2017	✓

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 Client : CARDNO (NSW/ACT)
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Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC302	12-Jul-2017	17-Jul-2017	19-Jul-2017	✓	18-Jul-2017	26-Aug-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC302	12-Jul-2017	17-Jul-2017	19-Jul-2017	✓	18-Jul-2017	26-Aug-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC302	12-Jul-2017	17-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC302	12-Jul-2017	17-Jul-2017	19-Jul-2017	✓	18-Jul-2017	26-Aug-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC302	12-Jul-2017	17-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC302	12-Jul-2017	17-Jul-2017	26-Jul-2017	✓	17-Jul-2017	26-Jul-2017	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	3	20	15.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	29	10.34	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	29	6.90	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	29	6.90	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **SOIL** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	5.88	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	29	6.90	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER** Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	10.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	10	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	10	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Total Soluble Salts	EA014	SOIL	In house: The concentration of Total Soluble Salts in a soil is calculated from the Electrical conductivity of a water extract. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
Volatile Organic Compounds	EP074	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)



Analytical Methods	Method	Matrix	Method Descriptions
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Drying only	EN020D	SOIL	In house
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

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Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

QUALITY CONTROL REPORT

Work Order	: ES1717236	Page	: 1 of 20
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division Sydney
Contact	: Mitch Blencowe	Contact	: Customer Services ES
Address	: PO Box 1285 Level 1, 47 Burelli Street Wollongong 2500	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9496 7700	Telephone	: +61-2-8784 8555
Project	: 8201714202-001-600	Date Samples Received	: 12-Jul-2017
Order number	: ----	Date Analysis Commenced	: 13-Jul-2017
C-O-C number	: ----	Issue Date	: 20-Jul-2017
Sampler	: MB		
Site	: ----		
Quote number	: EN/024/16		
No. of samples received	: 15		
No. of samples analysed	: 12		



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

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

This Quality Control Report contains the following information:

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

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 (%)
EA010: Conductivity (QC Lot: 996711)									
ES1717236-001	CTP105_0.1	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	27	29	8.88	0% - 20%
ES1717286-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	2270	2270	0.00	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 997594)									
EB1713012-009	Anonymous	EA037: pH (F)	----	0.1	pH Unit	8.9	8.9	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	6.1	6.1	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 999114)									
ES1717115-001	Anonymous	EA055: Moisture Content	----	1	%	12.3	11.5	6.70	0% - 50%
ES1717236-013	Blank	EA055: Moisture Content	----	1	%	3.9	4.2	7.23	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 996710)									
ES1717236-001	CTP105_0.1	ED045G: Chloride	16887-00-6	10	mg/kg	10	20	0.00	No Limit
ES1717337-001	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	1460	1520	4.28	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 999969)									
ES1717216-060	Anonymous	EG005T: Arsenic	7440-38-2	5	mg/kg	263	256	2.72	0% - 20%
ES1717236-010	CHA108_0.0	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	30	28	5.20	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	11	11	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	30	29	4.80	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	9	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	57	54	5.72	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
		ES1717216-060	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	2	2
		EG005T: Chromium	7440-47-3	2	mg/kg	9	10	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 999969) - continued									
ES1717216-060	Anonymous	EG005T: Nickel	7440-02-0	2	mg/kg	14	16	12.2	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	172	189	9.36	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	136	119	13.2	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	220	240	8.53	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 999970)									
ES1717236-010	CHA108_0.0	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1717216-060	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 995272)									
ES1717236-001	CTP105_0.1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1717237-010	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 995271)									
ES1717236-001	CTP105_0.1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1717237-010	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 995271) - continued									
ES1717237-010	Anonymous	EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 995271)									
ES1717236-001	CTP105_0.1	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
ES1717237-010	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 995271) - continued									
ES1717237-010	Anonymous	EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717216-002	Anonymous	EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074B: Oxygenated Compounds (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
ES1717216-002	Anonymous	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074B: Oxygenated Compounds (QC Lot: 996485) - continued									
ES1717216-002	Anonymous	EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717216-002	Anonymous	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717216-002	Anonymous	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report							
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)		
EP074E: Halogenated Aliphatic Compounds (QC Lot: 996485) - continued											
ES1717271-002	Anonymous	EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit		
ES1717216-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit		
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit		
		EP074F: Halogenated Aromatic Compounds (QC Lot: 996485)									
		ES1717271-002	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074: Bromobenzene	108-86-1			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074: 2-Chlorotoluene	95-49-8			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074: 4-Chlorotoluene	106-43-4			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074: 1,3-Dichlorobenzene	541-73-1			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074: 1,4-Dichlorobenzene	106-46-7			0.5	mg/kg	<0.5	<0.5	0.00	No Limit		



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074F: Halogenated Aromatic Compounds (QC Lot: 996485) - continued									
ES1717271-002	Anonymous	EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717216-002	Anonymous	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717216-002	Anonymous	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 996485)									
ES1717271-002	Anonymous	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1717216-002	Anonymous	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 995270)									
ES1717236-001	CTP105_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 995270) - continued									
ES1717236-001	CTP105_0.1	EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717237-010	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 995269)							
ES1717236-001	CTP105_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1717237-010	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 995568)									
ES1717103-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1717115-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 996484)									
ES1717216-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 995269)									
ES1717236-001	CTP105_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

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 Work Order : ES1717236
 Client : CARDNO (NSW/ACT)
 Project : 8201714202-001-600



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 995269) - continued									
ES1717236-001	CTP105_0.1	EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1717237-010	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 995568)									
ES1717103-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1717115-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 996484)									
ES1717216-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 995568)									
ES1717103-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1717115-002	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 996484)									
ES1717216-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 997137)									
ES1717257-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.004	0.001	111	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.004	0.004	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 997137) - continued									
ES1717257-001	Anonymous	EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
ES1717257-011	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 995201)									
ES1717137-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1717164-004	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 997001)									
ES1717103-020	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1717357-008	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 997001)									
ES1717103-020	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1717357-008	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 997001)									
ES1717103-020	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
ES1717357-008	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit		



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

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA010: Conductivity (QCLot: 996711)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	101	92	108
ED045G: Chloride by Discrete Analyser (QCLot: 996710)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	102	75	125
				<10	5000 mg/kg	93.8	79	117
EG005T: Total Metals by ICP-AES (QCLot: 999969)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	100	86	126
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.8	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.0	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	101	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	105	87	123
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	91.4	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 999970)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.8	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 995272)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	88.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 995271)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	103	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	108	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	108	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	107	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	99.0	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	108	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	107	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	107	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	105	66	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	102	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.3	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	106	69	115



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068A: Organochlorine Pesticides (OC) (QCLot: 995271) - continued								
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	106	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	62	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	95.8	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	91.9	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 995271)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	82.5	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	104	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	86.4	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	108	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	97.9	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	94.5	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	104	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	94.7	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	101	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	103	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	101	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	64.4	41	123
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 996485)								
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	83.0	67	113
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	89.6	65	117
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	84.9	66	122
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	84.9	68	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	88.2	69	119
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	87.4	69	117
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	85.2	69	115
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	90.3	66	118
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	92.1	59	125
EP074B: Oxygenated Compounds (QCLot: 996485)								
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	98.2	30	156



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074B: Oxygenated Compounds (QCLot: 996485) - continued								
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	89.4	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	92.3	62	132
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	90.3	54	136
EP074C: Sulfonated Compounds (QCLot: 996485)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	85.6	54	126
EP074D: Fumigants (QCLot: 996485)								
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	91.9	60	126
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	103	68	124
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	84.4	51	119
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	85.5	52	114
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	92.6	63	115
EP074E: Halogenated Aliphatic Compounds (QCLot: 996485)								
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	101	30	148
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	88.7	41	141
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	105	43	147
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	109	47	141
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	103	49	143
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	105	49	135
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	100	54	126
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	109	43	129
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	93.6	64	120
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	98.3	67	125
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	92.9	69	121
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	86.9	65	117
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	93.2	65	123
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	85.2	59	125
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	98.0	65	125
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	90.5	70	118
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	98.3	68	118
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	92.0	64	126
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	99.2	68	122
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	82.2	67	143
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	89.9	62	122
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	55.6	54	128
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	76.2	55	129
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	96.4	65	121
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	96.5	61	125
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	99.1	20	134

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074E: Halogenated Aliphatic Compounds (QCLot: 996485) - continued								
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	80.9	53	129
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	98.0	50	128
EP074F: Halogenated Aromatic Compounds (QCLot: 996485)								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	101	68	116
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	89.2	70	114
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	91.6	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	90.6	67	123
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	97.2	70	116
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	94.5	67	117
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	98.5	70	114
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	90.2	48	122
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	99.4	52	122
EP074G: Trihalomethanes (QCLot: 996485)								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	97.0	66	124
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	84.9	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	81.0	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	72.3	60	126
EP074H: Naphthalene (QCLot: 996485)								
EP074: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	67	129
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 995270)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	90.3	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	89.0	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	82.5	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	87.3	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.4	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	89.9	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	89.8	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	89.0	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	91.2	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	94.9	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	92.3	68	116
EP075(SIM): Benzo(k)fluoranthene	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	92.4	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	89.4	70	126
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	81.8	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	77.9	62	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	84.3	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 995269)								



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 995269) - continued								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	108	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	104	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	97.1	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 995568)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	116	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 996484)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	113	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 995269)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	110	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	106	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	81.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 995568)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	116	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 996484)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	108	68	128
EP080: BTEXN (QCLot: 995568)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	108	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	108	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	108	65	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	110	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	111	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	110	63	119
EP080: BTEXN (QCLot: 996484)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	110	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	94.0	65	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	96.8	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	95.1	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	113	63	119

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit			Result	LCS	Low
EG020T: Total Metals by ICP-MS (QCLot: 997137)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	104	82	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	84	112

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 997137) - continued								
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.6	86	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.8	83	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.6	85	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	79	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 995201)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	96.1	77	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 994948)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.1	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	92.5	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	81.6	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	95.8	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	86.2	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	94.4	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	90.1	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	89.4	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	78.0	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	78.7	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	74.6	62	119
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	76.7	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	84.0	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	85.9	60	118
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	84.8	61	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	83.2	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 994949)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	76.3	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	88.8	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	85.4	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 997001)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	116	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 994949)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	95.0	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	90.7	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	79.5	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 997001)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	115	75	127
EP080: BTEXN (QCLot: 997001)								

Matrix Spike (MS) Report

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 996710)							
ES1717236-001	CTP105_0.1	ED045G: Chloride	16887-00-6	1250 mg/kg	115	70	130
EG005T: Total Metals by ICP-AES (QCLot: 999969)							
ES1717216-060	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	123	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.3	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	90.3	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	100	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 999970)							
ES1717216-060	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	95.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 995272)							
ES1717236-001	CTP105_0.1	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	88.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 995271)							
ES1717236-001	CTP105_0.1	EP068: gamma-BHC	58-89-9	0.5 mg/kg	107	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	105	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	99.8	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	95.1	70	130
		EP068: Endrin	72-20-8	2 mg/kg	90.7	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	91.3	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 995271)							



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 995271) - continued							
ES1717236-001	CTP105_0.1	EP068: Diazinon	333-41-5	0.5 mg/kg	95.8	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	96.6	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	90.2	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	91.1	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	84.3	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 996485)							
ES1717216-002	Anonymous	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	116	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	116	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 996485)							
ES1717216-002	Anonymous	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	120	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 995270)							
ES1717236-001	CTP105_0.1	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	88.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 995269)							
ES1717236-001	CTP105_0.1	EP071: C10 - C14 Fraction	----	523 mg/kg	86.3	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	101	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	119	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 995568)							
ES1717103-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	103	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 996484)							
ES1717216-002	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	103	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 995269)							
ES1717236-001	CTP105_0.1	EP071: >C10 - C16 Fraction	----	860 mg/kg	102	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	102	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	111	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 995568)							
ES1717103-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.7	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 996484)							
ES1717216-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	105	70	130
EP080: BTEXN (QCLot: 995568)							
ES1717103-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	88.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	95.0	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	95.3	70	130
			106-42-3				
	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.9	70	130	



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 995568) - continued							
ES1717103-001	Anonymous	EP080: Naphthalene	91-20-3	2.5 mg/kg	94.9	70	130
EP080: BTEXN (QCLot: 996484)							
ES1717216-002	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	103	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	97.5	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.3	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	90.5	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	92.4	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	104	70	130
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 997137)							
ES1717236-012	QC302	EG020A-T: Arsenic	7440-38-2	1 mg/L	91.8	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	94.5	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	95.4	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	92.2	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	95.8	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	94.4	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	89.8	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 995201)							
ES1717137-003	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	91.6	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 997001)							
ES1717103-020	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	112	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 997001)							
ES1717103-020	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	117	70	130
EP080: BTEXN (QCLot: 997001)							
ES1717103-020	Anonymous	EP080: Benzene	71-43-2	25 µg/L	102	70	130
		EP080: Toluene	108-88-3	25 µg/L	101	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	97.0	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	97.1	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	100	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	109	70	130

CERTIFICATE OF ANALYSIS

Work Order : **ES1717236**
Client : **CARDNO (NSW/ACT)**
Contact : Mitch Blencowe
Address : PO Box 1285 Level 1, 47 Burelli Street
 Wollongong 2500
Telephone : +61 02 9496 7700
Project : 8201714202-001-600
Order number : ----
C-O-C number : ----
Sampler : MB
Site : ----
Quote number : EN/024/16
No. of samples received : 15
No. of samples analysed : 12

Page : 1 of 21
Laboratory : Environmental Division Sydney
Contact : Customer Services ES
Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : +61-2-8784 8555
Date Samples Received : 12-Jul-2017 20:50
Date Analysis Commenced : 13-Jul-2017
Issue Date : 20-Jul-2017 15:37



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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ashesh Patel	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Raymond Commodore	Instrument Chemist	Sydney Inorganics, Smithfield, NSW
Satishkumar Trivedi	Acid Sulfate Soils Supervisor	Brisbane Acid Sulphate Soils, Stafford, QLD



General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

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

- ED045G: LOR raised for Chloride on sample no:8 due to sample matrix.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		27	----	62	----	23
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		87	----	203	----	75
EA037: Ass Field Screening Analysis									
Ø pH (F)	----	0.1	pH Unit		7.4	7.5	7.8	8.0	----
Ø pH (Fox)	----	0.1	pH Unit		3.3	5.2	5.2	5.6	----
Ø Reaction Rate	----	1	-		3	4	3	3	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1	%		25.4	----	23.6	----	16.4
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	----	----	No
Asbestos Type	1332-21-4	-	--		-	----	----	----	-
Sample weight (dry)	----	0.01	g		18.4	----	----	----	18.1
APPROVED IDENTIFIER:	----	-	--		G.MORGAN	----	----	----	G.MORGAN
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		10	----	260	----	<10
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	----	----	<50
Selenium	7782-49-2	5	mg/kg		<5	----	----	----	<5
Arsenic	7440-38-2	5	mg/kg		5	----	<5	----	<5
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		23	----	27	----	27
Copper	7440-50-8	5	mg/kg		42	----	58	----	39
Lead	7439-92-1	5	mg/kg		18	----	11	----	17
Nickel	7440-02-0	2	mg/kg		11	----	9	----	11
Zinc	7440-66-6	5	mg/kg		91	----	67	----	79
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued									
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	----	----	----	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	----	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	----	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	----	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	----	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	----	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	----	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	----	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	----	----	<0.5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	----	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	----	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	----	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	----	----	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	----	----	<0.5
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	----	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	----	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	----	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	----	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	----	----	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	----	----	<5
Chloromethane	74-87-3	5	mg/kg		<5	----	----	----	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time				12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit	ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
				Result	Result	Result	Result	Result

EP074E: Halogenated Aliphatic Compounds - Continued

Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	<5
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	<5
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	<0.5

EP074F: Halogenated Aromatic Compounds

Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	----	----	----	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	----	----	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	----	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	----	----	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	----	----	<0.5
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	<1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	0.6	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	1.2	----	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		113	----	101	----	109
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		122	----	107	----	125
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		104	----	102	----	114
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		84.3	----	----	----	83.3
Toluene-D8	2037-26-5	0.5	%		93.3	----	----	----	91.5
4-Bromofluorobenzene	460-00-4	0.5	%		81.8	----	----	----	80.8
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		75.4	----	82.4	----	80.5
2-Chlorophenol-D4	93951-73-6	0.5	%		71.8	----	80.4	----	79.6
2,4,6-Tribromophenol	118-79-6	0.5	%		57.9	----	72.1	----	63.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP105_0.1	CTP105_0.5	CTP105_1.0	CTP105_1.9	CTP106_0.1
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-001	ES1717236-002	ES1717236-003	ES1717236-004	ES1717236-005
					Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		84.9	----	82.1	----	87.1
Anthracene-d10	1719-06-8	0.5	%		89.3	----	91.6	----	90.4
4-Terphenyl-d14	1718-51-0	0.5	%		97.9	----	98.4	----	97.0
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		88.4	----	95.5	----	87.6
Toluene-D8	2037-26-5	0.2	%		93.4	----	95.1	----	92.1
4-Bromofluorobenzene	460-00-4	0.2	%		82.0	----	97.6	----	81.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
					Result	Result	Result	Result	Result
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		26	50	17	----	----
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		85	164	57	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1	%		19.0	20.4	15.6	3.9	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	No	----	----
Asbestos Type	1332-21-4	-	--		-	----	-	----	----
Sample weight (dry)	----	0.01	g		19.0	----	18.3	----	----
APPROVED IDENTIFIER:	----	-	--		G.MORGAN	----	G.MORGAN	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<50	30	10	----	----
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	----
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	----
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		27	29	30	3	----
Copper	7440-50-8	5	mg/kg		26	32	30	<5	----
Lead	7439-92-1	5	mg/kg		10	10	10	<5	----
Nickel	7440-02-0	2	mg/kg		9	12	11	<2	----
Zinc	7440-66-6	5	mg/kg		49	56	57	<5	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time				12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit	ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
				Result	Result	Result	Result	Result

EP068A: Organochlorine Pesticides (OC) - Continued

Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-29-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----

EP068B: Organophosphorus Pesticides (OP)

Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
					Result	Result	Result	Result	Result
EP068B: Organophosphorus Pesticides (OP) - Continued									
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.05	<0.05	----
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	----	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	<5	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	<5	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	<5	----	----
Chloromethane	74-87-3	5	mg/kg		<5	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg		<5	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg		<5	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	<5	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time				12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit	ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	<0.5	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	<0.5	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	0.6	0.6	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	1.2	1.2	1.2	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	53
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	65



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	28
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	0.4
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	16.8
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	2.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	12.0
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	5.2
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	36.9
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	17.2
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		98.7	114	93.9	95.0	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		118	108	88.4	105	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		101	94.9	86.1	94.7	----
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		84.6	----	89.3	----	----
Toluene-D8	2037-26-5	0.5	%		92.6	----	95.4	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		82.5	----	85.4	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		79.2	79.8	81.0	81.9	----
2-Chlorophenol-D4	93951-73-6	0.5	%		76.7	77.2	81.3	83.2	----
2,4,6-Tribromophenol	118-79-6	0.5	%		56.5	60.0	65.4	68.9	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		88.1	85.2	86.2	86.2	----
Anthracene-d10	1719-06-8	0.5	%		93.7	91.4	90.8	91.9	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA107_0.1	CHA107_0.5	CHA108_0.0	Blank	Trip Spike
Client sampling date / time					12-Jul-2017 00:00	12-Jul-2017 00:00	12-Jul-2017 00:00	07-Jul-2017 00:00	07-Jul-2017 00:00
Compound	CAS Number	LOR	Unit		ES1717236-008	ES1717236-009	ES1717236-010	ES1717236-013	ES1717236-014
				Result	Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued									
4-Terphenyl-d14	1718-51-0	0.5	%		100	102	102	99.0	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		75.6	96.3	79.5	109	91.8
Toluene-D8	2037-26-5	0.2	%		90.4	92.7	93.7	103	90.8
4-Bromofluorobenzene	460-00-4	0.2	%		75.2	96.9	77.8	106	92.0



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	Trip Spike Control	----	----	----	----
Client sampling date / time				07-Jul-2017 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1717236-015	-----	-----	-----	-----	-----
Result				----	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	63	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	74	----	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	36	----	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	0.5	----	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	17.4	----	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	2.5	----	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	12.1	----	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	5.2	----	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	37.7	----	----	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	17.3	----	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	86.7	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	80.8	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	83.4	----	----	----	----	----



Analytical Results

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

Client sample ID

				QC302	----	----	----	----
Client sampling date / time				12-Jul-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1717236-012	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benzo(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC302	----	----	----	----
Client sampling date / time					12-Jul-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1717236-012	-----	-----	-----	-----
				Result	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		27.8	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		69.8	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%		46.7	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		72.9	----	----	----	----
Anthracene-d10	1719-06-8	1	%		87.9	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		65.1	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		106	----	----	----	----
Toluene-D8	2037-26-5	2	%		116	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		114	----	----	----	----



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 Soils		
EA200: Description	CTP105_0.1 - 12-Jul-2017 00:00	Mid brown sandy soil
EA200: Description	CTP106_0.1 - 12-Jul-2017 00:00	Mid brown sandy soil
EA200: Description	CHA107_0.1 - 12-Jul-2017 00:00	Mid brown sandy soil
EA200: Description	CHA108_0.0 - 12-Jul-2017 00:00	Mid brown sandy soil



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CHAIN OF CUSTODY

CLIENT:	Cardno	TURNAROUND REQUIREMENTS:	Standard TAT (last day date)	STANDARD TURNAROUND
OFFICE:	Level 1, 47 Burrell St Wollongong NSW 2500	(Standard TAT may be longer for some tests eg. Ultra Trace Organics)	☐	
PROJECT:	~~1702020000~~ 8201714201	QUOTE NO.:	Blank Check Agreement	
ORDER NUMBER:				
PROJECT MANAGER:	Mich Blencowe	CONTACT PH:	0476 354 778	
SAMPLER:	MB	SAMPLER MOBILE:	0476354778	
COC emailed? (YES / NO)		EDD FORMAT (or default):		
Email Reports to (will default to PM if no other addresses are listed):	milch.blencowe@cardno.com.au	DATE/TIME:	18/5/17	
Comments/SPECIAL HANDLING/STORAGE OR DISPOSAL:	* Asbestos to be tested from ziplock / ASS to be tested from jar / contaminants to be tested from jar / second jar.			
RECEIVED BY:	MB	DATE/TIME:	18.5.17	
RECEIVED BY:	MB	DATE/TIME:	18.5.17	

Environmental Division
Wollongong
Work Order Reference
EW1702227

Telephone : 02 42263125



LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	ANALYSIS REQUIRED INCLUDING SITES (NB: Site codes must be listed to agree suite price) (Spec Materials are required. Specify Total (unfilled bottles required) or Disposed (if any) (bottles required).	Additional Information
1	CTP100-0.1	17/5/17	S	2x jar, 2x bag	X S-16 X VOCs X Salinity EC + chlorine X Selenium & boron	X
2	CTP100-0.3	17/5/17	S	1x jar, 1x bag	X	X
3	CTP101-0.1	17/5/17	S	2x jar, 2x bag	X	X
4	CTP101-0.5	17/5/17	S	1x jar, 1x bag	X	X
5	CTP102-0.1	17/5/17	S	2x jar, 2x bag	X	X
6	CTP102-0.5	17/5/17	S	1x jar, 1x bag	X	X
7	CTP102-0.9	17/5/17	S	1x jar, 1x bag	X	X
8	CTP103-0.1	17/5/17	S	2x jar, 2x bag	X	X
9	CTP103-0.5	17/5/17	S	1x jar, 1x bag	X	X
10	CTP104-0.1	17/5/17	S	2x jar, 2x bag	X	X
11	CTP104-0.5	17/5/17	S	1x jar, 1x bag	X	X
12	CTP104-0.9	17/5/17	S	1x jar, 1x bag	X	X
13	CTP105-0.1	17/5/17	S	2x jar, 2x bag	X	X
14	CTP105-0.5	17/5/17	S	1x jar, 1x bag	X	X
15	CTP105-0.9	17/5/17	S	1x jar, 1x bag	X	X
16	QC100	17/5/17	S	1x jar	X	X
17	QC200	17/5/17	S	1x jar	X	X
18	QC300	17/5/17	W	4x bottles	X	X
19	Blank		S	2x jars	X	X
20	SPIKE		S	1x jar	X	X

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; OH = Nitric Preserved Plastic; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Amber Glass Preserved Plastic; F = Fumehydroxy Preserved Plastic;
V = VOA Vol HCl Preserved; VB = VOA Vol Sodium Bisulfate Preserved; VS = VOA Vol Sulfuric Preserved; AV = Air Tight Unpreserved Plastic; HS = HCl Preserved Plastic; HS = HCl Preserved Plastic; SP = Sulfuric Preserved Plastic; F = Fumehydroxy Preserved Plastic;
Z = Zinc Ascorbic Preserved Bottle; E = EDTA Preserved Bottle; ASS = Plastic Bag for Acid Sulfate Solids; B = Unpreserved Bag.

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EW1702227	Page	: 1 of 13
Amendment	: 1		
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division NSW South Coast
Contact	: Mitch Blencowe	Telephone	: 02 42253125
Project	: 8201714201	Date Samples Received	: 18-May-2017
Site	: ----	Issue Date	: 30-Jun-2017
Sampler	: Mitch Blencowe	No. of samples received	: 20
Order number	: ----	No. of samples analysed	: 20

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO** Method Blank value outliers occur.
- **NO** Duplicate outliers occur.
- **NO** Laboratory Control outliers occur.
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

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

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

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	ES1712134--012	Anonymous	Lead	7439-92-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: WATER

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

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

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

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

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	24-May-2017	24-May-2017	✓	24-May-2017	24-May-2017	✓
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	23-May-2017	24-May-2017	✓	23-May-2017	20-Jun-2017	✓
Soil Glass Jar - Unpreserved (EA010) QC100	18-May-2017	23-May-2017	25-May-2017	✓	23-May-2017	20-Jun-2017	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis								
Snap Lock Bag - frozen (EA037) CTP101_0.9, CTP103_0.5, CTP104_0.5,	CTP102_0.5, CTP103_0.9, CTP104_0.9	18-May-2017	25-May-2017	14-Nov-2017	✓	25-May-2017	14-Nov-2017	✓
Snap Lock Bag - frozen on receipt at ALS (EA037) CHA100_0.3, CTP101_0.5	CTP100_0.5,	18-May-2017	25-May-2017	14-Nov-2017	✓	25-May-2017	14-Nov-2017	✓
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	----	----	----	22-May-2017	31-May-2017	✓
Soil Glass Jar - Unpreserved (EA055) QC100		18-May-2017	----	----	----	22-May-2017	01-Jun-2017	✓
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	----	----	----	25-May-2017	13-Nov-2017	✓
EA152: Soil Particle Density								
Snap Lock Bag (EA152) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	----	----	----	25-May-2017	13-Nov-2017	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Snap Lock Bag (EA200) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	----	----	----	20-May-2017	13-Nov-2017	✓
ED007: Exchangeable Cations								
Soil Glass Jar - Unpreserved (ED007) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	26-May-2017	14-Jun-2017	✓	26-May-2017	14-Jun-2017	✓
ED045G: Chloride by Discrete Analyser								
Soil Glass Jar - Unpreserved (ED045G) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	23-May-2017	14-Jun-2017	✓	23-May-2017	20-Jun-2017	✓
Soil Glass Jar - Unpreserved (ED045G) QC100		18-May-2017	23-May-2017	15-Jun-2017	✓	23-May-2017	20-Jun-2017	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	22-May-2017	13-Nov-2017	✓	22-May-2017	13-Nov-2017	✓
Soil Glass Jar - Unpreserved (EG005T) QC100		18-May-2017	22-May-2017	14-Nov-2017	✓	22-May-2017	14-Nov-2017	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	22-May-2017	14-Jun-2017	✓	23-May-2017	14-Jun-2017	✓
Soil Glass Jar - Unpreserved (EG035T) QC100		18-May-2017	22-May-2017	15-Jun-2017	✓	23-May-2017	15-Jun-2017	✓
EP004: Organic Matter								
Soil Glass Jar - Unpreserved (EP004) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	23-May-2017	14-Jun-2017	✓	23-May-2017	14-Jun-2017	✓
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved (EP066) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP066) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jul-2017	✓
EP068A: Organochlorine Pesticides (OC)								
Soil Glass Jar - Unpreserved (EP068) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP068) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jul-2017	✓
EP068B: Organophosphorus Pesticides (OP)								
Soil Glass Jar - Unpreserved (EP068) CHA100_0.1, CTP101_0.1, CTP103_0.1,	CTP100_0.1, CTP102_0.1, CTP104_0.1	17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP068) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jul-2017	✓
EP074A: Monocyclic Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074B: Oxygenated Compounds								
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074C: Sulfonated Compounds								
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074D: Fumigants								
Soil Glass Jar - Unpreserved (EP074) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	24-May-2017	✓	23-May-2017	24-May-2017	✓
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074E: Halogenated Aliphatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	24-May-2017	✓	23-May-2017	24-May-2017	✓
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074F: Halogenated Aromatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	24-May-2017	✓	23-May-2017	24-May-2017	✓
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074G: Trihalomethanes								
Soil Glass Jar - Unpreserved (EP074) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	24-May-2017	✓	23-May-2017	24-May-2017	✓
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓
EP074H: Naphthalene								
Soil Glass Jar - Unpreserved (EP074) QC100		18-May-2017	22-May-2017	25-May-2017	✓	23-May-2017	25-May-2017	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jul-2017	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	22-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	31-May-2017	✓
Soil Glass Jar - Unpreserved (EP080) SPIKE, TSC		18-May-2017	19-May-2017	01-Jun-2017	✓	22-May-2017	01-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP071) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	22-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jun-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	22-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	31-May-2017	✓
Soil Glass Jar - Unpreserved (EP080) SPIKE, TSC		18-May-2017	19-May-2017	01-Jun-2017	✓	22-May-2017	01-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP071) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	22-May-2017	01-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jun-2017	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) CHA100_0.1, CTP101_0.1, CTP103_0.1, CTP100_0.1, CTP102_0.1, CTP104_0.1		17-May-2017	22-May-2017	31-May-2017	✓	23-May-2017	31-May-2017	✓
Soil Glass Jar - Unpreserved (EP080) BLANK, TSC, SPIKE,		18-May-2017	19-May-2017	01-Jun-2017	✓	22-May-2017	01-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP080) QC100		18-May-2017	22-May-2017	01-Jun-2017	✓	23-May-2017	01-Jun-2017	✓

Matrix: **WATER**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC300	18-May-2017	24-May-2017	14-Nov-2017	✓	24-May-2017	14-Nov-2017	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC300	18-May-2017	----	----	----	23-May-2017	15-Jun-2017	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC300	18-May-2017	20-May-2017	25-May-2017	✓	23-May-2017	29-Jun-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC300	18-May-2017	20-May-2017	25-May-2017	✓	23-May-2017	29-Jun-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC300	18-May-2017	23-May-2017	01-Jun-2017	✓	24-May-2017	01-Jun-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC300	18-May-2017	20-May-2017	25-May-2017	✓	23-May-2017	29-Jun-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC300	18-May-2017	23-May-2017	01-Jun-2017	✓	24-May-2017	01-Jun-2017	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC300	18-May-2017	23-May-2017	01-Jun-2017	✓	24-May-2017	01-Jun-2017	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	30	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	4	21	19.05	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	2	21	9.52	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	14	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	30	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	11.11	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	11	18.18	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	13	7.69	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Total Mercury by FIMS	EG035T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	13	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3)
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Total Soluble Salts	EA014	SOIL	In house: The concentration of Total Soluble Salts in a soil is calculated from the Electrical conductivity of a water extract. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Soil Particle Density	* EA152	SOIL	Soil Particle Density by AS 1289.3.5.1-2006 : Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504)



Analytical Methods	Method	Matrix	Method Descriptions
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
Volatile Organic Compounds	EP074	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH ₄ Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Drying only	EN020D	SOIL	In house



Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

QUALITY CONTROL REPORT

Work Order : **EW1702227**

Page : 1 of 21

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Contact : Mitch Blencowe

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Telephone : +61 02 9496 7700

Project : 8201714201

Order number : ----

C-O-C number : ----

Sampler : Mitch Blencowe

Site : ----

Quote number : EN/024/16

No. of samples received : 20

No. of samples analysed : 20

Laboratory : Environmental Division NSW South Coast

Contact : Glenn Davies

Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW

Telephone : 02 42253125

Date Samples Received : 18-May-2017

Date Analysis Commenced : 19-May-2017

Issue Date : 30-Jun-2017



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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 904961)									
ES1712314-003	Anonymous	EA001: pH (CaCl2)	----	0.1	pH Unit	4.8	4.7	0.00	0% - 20%
EA010: Conductivity (QC Lot: 900828)									
EW1702220-003	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	218	234	6.76	0% - 20%
EW1702227-016	QC100	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	20	19	0.00	0% - 50%
EA037: Ass Field Screening Analysis (QC Lot: 906375)									
EW1702227-002	CHA100_0.3	EA037: pH (F)	----	0.1	pH Unit	6.0	6.0	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	3.9	4.0	2.53	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 900776)									
EW1702184-009	Anonymous	EA055: Moisture Content	----	1	%	9.1	8.8	2.76	No Limit
WN1702056-002	Anonymous	EA055: Moisture Content	----	1	%	3.1	2.6	15.8	No Limit
ED007: Exchangeable Cations (QC Lot: 910393)									
ES1711965-002	Anonymous	ED007: Exchangeable Calcium	----	0.1	meq/100g	3.1	3.1	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	2.0	2.0	0.00	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	5.4	5.4	0.00	0% - 20%
ES1712275-009	Anonymous	ED007: Exchangeable Calcium	----	0.1	meq/100g	0.6	0.6	0.00	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	10.7	10.6	0.00	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.2	0.2	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	10.4	10.5	0.00	0% - 20%
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	21.9	21.9	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 900822)									
ES1712153-004	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.00	No Limit
ES1711995-004	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	20	10	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 900829)									
EW1702227-016	QC100	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 901533)									
ES1712134-012	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	4	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	13	15	9.68	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	58	62	6.60	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	5330	5170	3.12	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	360	393	8.81	0% - 20%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	7630	7450	2.39	0% - 20%
EW1702227-016	QC100	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	25	25	0.00	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	7	7	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	23	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	10	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	46	45	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	38300	38500	0.513	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 901534)									
ES1712134-012	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.8	0.9	0.00	No Limit
EW1702227-016	QC100	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP004: Organic Matter (QC Lot: 902438)									
ES1712159-001	Anonymous	EP004: Organic Matter	----	0.5	%	<0.5	<0.5	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.00	No Limit
EW1702227-013	CTP104_0.1	EP004: Organic Matter	----	0.5	%	2.5	2.4	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	1.4	1.4	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 897736)									
ES1712027-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EW1702227-008	CTP102_0.1	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 897735)									
ES1712027-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 897735) - continued									
ES1712027-001	Anonymous	EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EW1702227-008	CTP102_0.1	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068B: Organophosphorus Pesticides (OP) (QC Lot: 897735)							
ES1712027-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 897735) - continued									
ES1712027-001	Anonymous	EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EW1702227-008	CTP102_0.1	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 899399)							
EW1702227-001	CHA100_0.1	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 899399) - continued									
EW1702227-001	CHA100_0.1	EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit		
EP074B: Oxygenated Compounds (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074E: Halogenated Aliphatic Compounds (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 899399) - continued									
EW1702227-001	CHA100_0.1	EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit		
EP074F: Halogenated Aromatic Compounds (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 899399)									
EW1702227-001	CHA100_0.1	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 897733)									
ES1712027-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



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: 897733) - continued									
ES1712027-001	Anonymous	EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EW1702227-008	CTP102_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080/071: Total Petroleum Hydrocarbons (QC Lot: 897149)							
ES1712070-050	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1712070-066	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 897734)									
ES1712027-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 897734) - continued									
ES1712027-001	Anonymous	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EW1702227-008	CTP102_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 899400)									
EW1702227-001	CHA100_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 897149)									
ES1712070-050	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1712070-066	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 897734)									
ES1712027-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EW1702227-008	CTP102_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 899400)									
EW1702227-001	CHA100_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 897149)									
ES1712070-050	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1712070-066	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit	
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
EP080: BTEXN (QC Lot: 899400)									
EW1702227-001	CHA100_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 899400) - continued									
EW1702227-001	CHA100_0.1	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 904833)									
EW1702197-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.038	0.038	2.65	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.003	80.6	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.024	0.023	6.99	No Limit
EW1702225-007	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	5.08	4.86	4.45	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.003	0.002	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	4.12	4.01	2.75	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.010	0.010	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	5.05	4.85	3.96	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	60.9	61.9	1.55	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 901586)									
ES1711307-052	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1712156-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 902996)									
ES1712076-022	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1712232-012	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 902996)									
ES1712076-022	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1712232-012	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 902996)									
ES1712076-022	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1712232-012	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 902996) - continued									
ES1712232-012	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit



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

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA010: Conductivity (QCLot: 900828)								
EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1412 µS/cm	95.8	92	108
ED007: Exchangeable Cations (QCLot: 910393)								
ED007: Exchangeable Calcium	----	0.1	meq/100g	<0.1	1 meq/100g	101	76	122
ED007: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	1.67 meq/100g	98.4	76	118
ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.51 meq/100g	104	80	120
ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	96.6	80	120
ED007: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
ED045G: Chloride by Discrete Analyser (QCLot: 900822)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	106	75	125
				<10	5000 mg/kg	96.6	79	117
ED045G: Chloride by Discrete Analyser (QCLot: 900829)								
ED045G: Chloride	16887-00-6	10	mg/kg	<10	50 mg/kg	104	75	125
				<10	5000 mg/kg	96.4	79	117
EG005T: Total Metals by ICP-AES (QCLot: 901533)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	99.3	86	126
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.4	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	76.3	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.2	86	120
EG005T: Iron	7439-89-6	50	mg/kg	<50	----	----	----	----
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	94.6	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	89.3	87	123
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	110	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	91.3	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 901534)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	94.4	70	105
EP004: Organic Matter (QCLot: 902438)								
EP004: Organic Matter	----	0.5	%	<0.5	2.53 %	97.4	82	98
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.46 %	97.8	81	99
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 897736)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	112	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 897735)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	69	113



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068A: Organochlorine Pesticides (OC) (QCLot: 897735) - continued								
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	97.1	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.4	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	103	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	101	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	99.3	66	116
EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	101	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	100	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	99.7	69	115
EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	97.2	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	101	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	102	62	124
EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	99.5	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	98.5	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 897735)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	88.6	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	99.3	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	102	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	97.3	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	100	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	102	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	106	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	104	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	100	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	103	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	104	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	102	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	101	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	104	65	127



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP068B: Organophosphorus Pesticides (OP) (QCLot: 897735) - continued								
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	99.6	41	123
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 899399)								
EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	100	71	121
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	98.5	65	131
EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	98.2	72	114
EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	99.3	70	116
	106-42-3							
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	99.8	67	113
EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	99.2	75	115
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	98.0	65	117
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	95.8	66	122
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	95.9	68	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	97.7	69	119
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	95.2	69	117
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	95.9	69	115
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	97.2	66	118
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	95.6	59	125
EP074B: Oxygenated Compounds (QCLot: 899399)								
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	100	30	156
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	95.2	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	100	62	132
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	101	54	136
EP074C: Sulfonated Compounds (QCLot: 899399)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	100	54	126
EP074D: Fumigants (QCLot: 899399)								
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	100	60	126
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	99.2	68	124
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	99.6	51	119
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	101	52	114
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	97.3	63	115
EP074E: Halogenated Aliphatic Compounds (QCLot: 899399)								
EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	99.2	30	148
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	108	41	141
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	100	43	147
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	106	47	141
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	104	49	143
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	100	49	135
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	102	54	126



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP074E: Halogenated Aliphatic Compounds (QCLot: 899399) - continued								
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	116	43	129
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	104	64	120
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	103	67	125
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	101	69	121
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	102	65	117
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	101	65	123
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	102	59	125
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	102	65	125
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	101	70	118
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	99.4	68	118
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	103	64	126
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	103	68	122
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	99.8	67	143
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	98.5	62	122
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	99.1	54	128
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	112	55	129
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	102	65	121
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	99.1	61	125
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	95.6	20	134
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	98.9	53	129
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	95.0	50	128
EP074F: Halogenated Aromatic Compounds (QCLot: 899399)								
EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	97.4	68	116
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	95.5	70	114
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	94.4	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	96.8	67	123
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	96.3	70	116
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	96.3	67	117
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	97.3	70	114
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	93.4	48	122
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	96.0	52	122
EP074G: Trihalomethanes (QCLot: 899399)								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	99.3	66	124
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	98.6	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	99.6	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	102	60	126
EP074H: Naphthalene (QCLot: 899399)								
EP074: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	98.6	67	129



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 897733)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	88.9	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	91.5	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	92.1	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	91.3	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	89.3	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.6	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.2	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	89.7	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	95.8	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	97.6	68	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	92.1	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.2	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.0	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	89.3	62	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	93.8	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 897149)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	79.0	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 897734)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	98.3	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	99.5	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.1	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 899400)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	80.2	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 897149)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	79.1	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 897734)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	105	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	102	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	92.1	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 899400)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	80.6	68	128
EP080: BTEXN (QCLot: 897149)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	80.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	83.4	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	82.8	65	117



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080: BTEXN (QCLot: 897149) - continued								
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	83.2	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	84.6	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	97.5	63	119
EP080: BTEXN (QCLot: 899400)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	79.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	80.4	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	73.2	65	117
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	79.7	66	118
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	80.2	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	88.7	63	119
Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 904833)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	94.8	82	114
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	95.5	84	112
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	86	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	87.9	83	118
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	93.3	85	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.5	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	92.7	79	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 901586)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	77	111
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 897589)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	69.4	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	72.7	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	72.6	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	74.4	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	74.2	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	79.5	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	81.6	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	84.3	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	78.9	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	80.0	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	73.1	62	119
	205-82-3							



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 897589) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	93.8	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	81.4	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	81.7	60	118
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	86.3	61	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	82.5	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 897588)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	93.3	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	96.6	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	90.8	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 902996)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	103	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 897588)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	90.4	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	99.6	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	101	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 902996)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	108	75	127
EP080: BTEXN (QCLot: 902996)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	101	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	102	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	104	70	120
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	106	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	112	70	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number			Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 900822)							
ES1711995-001	Anonymous	ED045G: Chloride	16887-00-6	1250 mg/kg	110	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 900829)							
EW1702227-016	QC100	ED045G: Chloride	16887-00-6	1250 mg/kg	110	70	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 901533)							
ES1712134-012	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	96.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	106	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	96.8	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	# Not Determined	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.7	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	124	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 901534)							
ES1712134-012	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	107	70	130
EP004: Organic Matter (QCLot: 902438)							
ES1712159-001	Anonymous	EP004: Organic Matter	----	4.58 %	96.8	70	130
		EP004: Total Organic Carbon	----	2.66 %	96.4	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 897736)							
ES1712027-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	108	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 897735)							
ES1712027-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	97.6	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	105	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	104	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	98.4	70	130
		EP068: Endrin	72-20-8	2 mg/kg	98.4	70	130
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	97.1	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 897735)							
ES1712027-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	80.8	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	93.0	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	104	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	101	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	99.6	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 899399)							
EW1702227-001	CHA100_0.1	EP074: Benzene	71-43-2	2.5 mg/kg	76.7	70	130
		EP074: Toluene	108-88-3	2.5 mg/kg	79.0	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 899399)							
EW1702227-001	CHA100_0.1	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	73.6	70	130
		EP074: Trichloroethene	79-01-6	2.5 mg/kg	72.9	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 899399)							
EW1702227-001	CHA100_0.1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	79.9	70	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 897733)							
ES1712027-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	87.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 897149)							
ES1712070-050	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	79.5	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 897734)							
ES1712027-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	90.4	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	107	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	116	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 899400)							
EW1702227-001	CHA100_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	81.8	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 897149)							
ES1712070-050	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 897734)							
ES1712027-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	95.0	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	115	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	93.1	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 899400)							
EW1702227-001	CHA100_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	82.1	70	130
EP080: BTEXN (QCLot: 897149)							
ES1712070-050	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	74.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	78.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	71.1	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	71.2	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	72.7	70	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	91.2	70	130	
EP080: BTEXN (QCLot: 899400)							
EW1702227-001	CHA100_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	73.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	74.7	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	75.6	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	77.2	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	78.4	70	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	77.5	70	130	

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 904833)							
EW1702197-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	94.4	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	99.1	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	106	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	93.2	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	98.8	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	92.1	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	93.2	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 901586)							
ES1711307-053	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	88.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 902996)							
ES1712076-022	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	99.6	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 902996)							
ES1712076-022	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	94.0	70	130
EP080: BTEXN (QCLot: 902996)							
ES1712076-022	Anonymous	EP080: Benzene	71-43-2	25 µg/L	87.4	70	130
		EP080: Toluene	108-88-3	25 µg/L	88.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	83.5	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	84.1	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	90.8	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	98.5	70	130

CERTIFICATE OF ANALYSIS

Work Order : **EW1702227**

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Contact : Mitch Blencowe

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Telephone : +61 02 9496 7700

Project : 8201714201

Order number : ----

C-O-C number : ----

Sampler : Mitch Blencowe

Site : ----

Quote number : EN/024/16

No. of samples received : 20

No. of samples analysed : 20

Page : 1 of 35

Laboratory : Environmental Division NSW South Coast

Contact : Glenn Davies

Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW

Telephone : 02 42253125

Date Samples Received : 18-May-2017 14:09

Date Analysis Commenced : 19-May-2017

Issue Date : 30-Jun-2017 09:56



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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Ben Felgendrejeris		Brisbane Acid Sulphate Soils, Stafford, QLD
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

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

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- ED045G: LOR raised for Chloride on a few samples due to sample matrix.
- Amendment (30/06/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Mitch Blencowe on 30/06/2017. All analysis results are as per the previous report.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.



- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
 - EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
-



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time					17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		4.8	----	5.2	----	5.1
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		91	----	34	----	21
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		297	----	110	----	69
EA037: Ass Field Screening Analysis									
Ø pH (F)	----	0.1	pH Unit		----	6.0	----	7.2	----
Ø pH (Fox)	----	0.1	pH Unit		----	3.9	----	5.3	----
Ø Reaction Rate	----	1	-		----	4	----	2	----
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		15.9	----	23.6	----	18.5
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		13	----	32	----	18
EA152: Soil Particle Density									
Ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		2.37	----	2.36	----	2.41
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		No	----	No	----	No
Asbestos Type	1332-21-4	-	--		-	----	-	----	-
Sample weight (dry)	----	0.01	g		482	----	349	----	337
APPROVED IDENTIFIER:	----	-	--		G.MORGAN	----	G.MORGAN	----	S.SPOONER
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		4.7	----	15.3	----	15.1
Exchangeable Magnesium	----	0.1	meq/100g		2.9	----	7.9	----	6.7
Exchangeable Potassium	----	0.1	meq/100g		1.1	----	0.5	----	0.1
Exchangeable Sodium	----	0.1	meq/100g		<0.1	----	0.3	----	0.3
Cation Exchange Capacity	----	0.1	meq/100g		8.8	----	24.0	----	22.3
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		60	----	<100	----	<100
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	<50
Iron	7439-89-6	0.005	%		2.10	----	4.62	----	4.52
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	<5
Arsenic	7440-38-2	5	mg/kg		<5	----	<5	----	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time					17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
					Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued									
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		23	----	25	----	32
Copper	7440-50-8	5	mg/kg		14	----	32	----	25
Lead	7439-92-1	5	mg/kg		15	----	12	----	9
Nickel	7440-02-0	2	mg/kg		6	----	9	----	12
Zinc	7440-66-6	5	mg/kg		38	----	55	----	54
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		4.8	----	3.8	----	2.8
Total Organic Carbon	----	0.5	%		2.8	----	2.2	----	1.6
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time				17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	<5	----	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time				17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
				Result	Result	Result	Result	Result

EP074E: Halogenated Aliphatic Compounds - Continued

Chloromethane	74-87-3	5	mg/kg	<5	----	<5	----	<5
Vinyl chloride	75-01-4	5	mg/kg	<5	----	<5	----	<5
Bromomethane	74-83-9	5	mg/kg	<5	----	<5	----	<5
Chloroethane	75-00-3	5	mg/kg	<5	----	<5	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	<5	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5

EP074F: Halogenated Aromatic Compounds

Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time					17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
					Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued									
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	0.6	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	1.2	----	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	<50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time					17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		106	----	116	----	120
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		86.0	----	89.4	----	115
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		91.0	----	89.8	----	102
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		80.1	----	85.9	----	90.2
Toluene-D8	2037-26-5	0.5	%		79.7	----	85.4	----	90.1
4-Bromofluorobenzene	460-00-4	0.5	%		77.1	----	75.0	----	77.1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		86.4	----	85.4	----	85.0
2-Chlorophenol-D4	93951-73-6	0.5	%		82.5	----	80.8	----	84.3
2,4,6-Tribromophenol	118-79-6	0.5	%		78.6	----	78.4	----	77.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		86.6	----	83.0	----	82.7



Analytical Results

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

Client sample ID

				CHA100_0.1	CHA100_0.3	CTP100_0.1	CTP100_0.5	CTP101_0.1
Client sampling date / time				17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-001	EW1702227-002	EW1702227-003	EW1702227-004	EW1702227-005
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
Anthracene-d10	1719-06-8	0.5	%	102	----	97.7	----	101
4-Terphenyl-d14	1718-51-0	0.5	%	82.9	----	88.6	----	88.2
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	85.7	----	91.8	----	96.2
Toluene-D8	2037-26-5	0.2	%	79.4	----	85.6	----	89.8
4-Bromofluorobenzene	460-00-4	0.2	%	82.2	----	80.4	----	81.4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		----	----	4.8	----	4.6
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		----	----	25	----	18
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		----	----	80	----	60
EA037: Ass Field Screening Analysis									
Ø pH (F)	----	0.1	pH Unit		7.1	6.9	----	7.8	----
Ø pH (Fox)	----	0.1	pH Unit		5.3	4.6	----	5.6	----
Ø Reaction Rate	----	1	-		3	3	----	2	----
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		----	----	20.6	----	17.8
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		----	----	36	----	28
EA152: Soil Particle Density									
Ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		----	----	2.34	----	2.37
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		----	----	No	----	No
Asbestos Type	1332-21-4	-	--		----	----	-	----	-
Sample weight (dry)	----	0.01	g		----	----	310	----	448
APPROVED IDENTIFIER:	----	-	--		----	----	S.SPOONER	----	S.SPOONER
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		----	----	12.4	----	9.3
Exchangeable Magnesium	----	0.1	meq/100g		----	----	7.2	----	4.0
Exchangeable Potassium	----	0.1	meq/100g		----	----	0.4	----	0.2
Exchangeable Sodium	----	0.1	meq/100g		----	----	0.5	----	0.2
Cation Exchange Capacity	----	0.1	meq/100g		----	----	20.6	----	13.8
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		----	----	<100	----	<100
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		----	----	<50	----	<50
Iron	7439-89-6	0.005	%		----	----	3.59	----	3.82
Selenium	7782-49-2	5	mg/kg		----	----	<5	----	<5
Arsenic	7440-38-2	5	mg/kg		----	----	<5	----	<5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
					Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued									
Cadmium	7440-43-9	1	mg/kg		----	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		----	----	14	----	25
Copper	7440-50-8	5	mg/kg		----	----	15	----	22
Lead	7439-92-1	5	mg/kg		----	----	13	----	13
Nickel	7440-02-0	2	mg/kg		----	----	5	----	7
Zinc	7440-66-6	5	mg/kg		----	----	42	----	48
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	<0.1	----	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	5.7	----	4.3
Total Organic Carbon	----	0.5	%		----	----	3.3	----	2.5
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	----	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	----	<0.05
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	----	<0.5
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	----	<5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloromethane	74-87-3	5	mg/kg	----	----	<5	----	<5
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	----	<5
Bromomethane	74-83-9	5	mg/kg	----	----	<5	----	<5
Chloroethane	75-00-3	5	mg/kg	----	----	<5	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	----	<0.5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
				Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued								
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	----	<0.5
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	----	<0.5
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	----	<0.5
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	0.6	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	1.2	----	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	----	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg	----	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	----	<50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg		----	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg		----	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg		----	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		----	----	<50	----	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		----	----	<50	----	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		----	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg		----	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		----	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		----	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		----	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg		----	----	<0.2	----	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		----	----	<0.5	----	<0.5
Naphthalene	91-20-3	1	mg/kg		----	----	<1	----	<1
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	----	95.0	----	113
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		----	----	92.7	----	95.9
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		----	----	97.7	----	91.2
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		----	----	86.7	----	90.5
Toluene-D8	2037-26-5	0.5	%		----	----	88.4	----	83.4
4-Bromofluorobenzene	460-00-4	0.5	%		----	----	77.6	----	75.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		----	----	91.7	----	87.1
2-Chlorophenol-D4	93951-73-6	0.5	%		----	----	82.2	----	82.6
2,4,6-Tribromophenol	118-79-6	0.5	%		----	----	73.3	----	82.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		----	----	81.2	----	87.9



Analytical Results

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

Client sample ID

				CTP101_0.5	CTP101_0.9	CTP102_0.1	CTP102_0.5	CTP103_0.1
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-006	EW1702227-007	EW1702227-008	EW1702227-009	EW1702227-010
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
Anthracene-d10	1719-06-8	0.5	%	----	----	102	----	105
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	87.2	----	88.0
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	92.5	----	96.8
Toluene-D8	2037-26-5	0.2	%	----	----	88.6	----	83.5
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	81.9	----	80.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
					Result	Result	Result	Result	Result
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit		----	----	4.7	----	----
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		----	----	19	----	----
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		----	----	61	----	----
EA037: Ass Field Screening Analysis									
Ø pH (F)	----	0.1	pH Unit		6.8	7.0	----	6.8	6.9
Ø pH (Fox)	----	0.1	pH Unit		5.0	5.2	----	5.2	5.0
Ø Reaction Rate	----	1	-		3	2	----	2	2
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		----	----	19.4	----	----
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%		----	----	34	----	----
EA152: Soil Particle Density									
Ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3		----	----	2.41	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg		----	----	No	----	----
Asbestos Type	1332-21-4	-	--		----	----	-	----	----
Sample weight (dry)	----	0.01	g		----	----	425	----	----
APPROVED IDENTIFIER:	----	-	--		----	----	S.SPOONER	----	----
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g		----	----	7.0	----	----
Exchangeable Magnesium	----	0.1	meq/100g		----	----	6.5	----	----
Exchangeable Potassium	----	0.1	meq/100g		----	----	0.2	----	----
Exchangeable Sodium	----	0.1	meq/100g		----	----	0.6	----	----
Cation Exchange Capacity	----	0.1	meq/100g		----	----	14.3	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		----	----	<100	----	----
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		----	----	<50	----	----
Iron	7439-89-6	0.005	%		----	----	3.62	----	----
Selenium	7782-49-2	5	mg/kg		----	----	<5	----	----
Arsenic	7440-38-2	5	mg/kg		----	----	<5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
					Result	Result	Result	Result	Result
EG005T: Total Metals by ICP-AES - Continued									
Cadmium	7440-43-9	1	mg/kg		----	----	<1	----	----
Chromium	7440-47-3	2	mg/kg		----	----	23	----	----
Copper	7440-50-8	5	mg/kg		----	----	18	----	----
Lead	7439-92-1	5	mg/kg		----	----	11	----	----
Nickel	7440-02-0	2	mg/kg		----	----	6	----	----
Zinc	7440-66-6	5	mg/kg		----	----	31	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	<0.1	----	----
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	----	2.5	----	----
Total Organic Carbon	----	0.5	%		----	----	1.4	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		----	----	<0.05	----	----
4,4'-DDE	72-55-9	0.05	mg/kg		----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg		----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		----	----	<0.05	----	----
4,4'-DDD	72-54-8	0.05	mg/kg		----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	<0.05	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
4,4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	----	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	----	----
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	----	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	----	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	----	----	<0.5	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	----	----	<5	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
Chloromethane	74-87-3	5	mg/kg	----	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg	----	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg	----	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg	----	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	----	----	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg	----	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg	----	----	<0.5	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	----	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	----	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	----	<0.5	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	----	<0.5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	----	<0.5	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	----	<0.5	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	----	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	----	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	----	<0.5	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	----	<0.5	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	----	<0.5	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
				Result	Result	Result	Result	Result
EP074F: Halogenated Aromatic Compounds - Continued								
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	----	<0.5	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	----	<0.5	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	----	----	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	----	<0.5	----	----
Bromoform	75-25-2	0.5	mg/kg	----	----	<0.5	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	----	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	----	----
Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	----	----
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	----	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	----	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	----	----	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	----	----	1.2	----	----
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	----	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg	----	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	----	----	<50	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Compound				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
CAS Number	LOR	Unit		EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
				Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	----	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	----	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	<50	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	----	<50	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	----	<0.2	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg	----	----	<1	----	----
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	78.8	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	77.6	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	88.6	----	----
EP074S: VOC Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.5	%	----	----	90.7	----	----
Toluene-D8	2037-26-5	0.5	%	----	----	83.6	----	----
4-Bromofluorobenzene	460-00-4	0.5	%	----	----	74.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	----	----	82.8	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	----	----	82.3	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%	----	----	93.7	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	----	----	94.8	----	----



Analytical Results

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

Client sample ID

				CTP103_0.5	CTP103_0.9	CTP104_0.1	CTP104_0.5	CTP104_0.9
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	17-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702227-011	EW1702227-012	EW1702227-013	EW1702227-014	EW1702227-015
				Result	Result	Result	Result	Result
EP075(SIM)T: PAH Surrogates - Continued								
Anthracene-d10	1719-06-8	0.5	%	----	----	97.6	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	----	----	100	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	----	96.8	----	----
Toluene-D8	2037-26-5	0.2	%	----	----	83.1	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	----	----	79.0	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC100	BLANK	SPIKE	TSC	----
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit		EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
					Result	Result	Result	Result	----
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm		20	----	----	----	----
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg		64	----	----	----	----
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		17.0	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	10	mg/kg		<10	----	----	----	----
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	----	----	----
Selenium	7782-49-2	5	mg/kg		<5	----	----	----	----
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		25	----	----	----	----
Copper	7440-50-8	5	mg/kg		23	----	----	----	----
Lead	7439-92-1	5	mg/kg		10	----	----	----	----
Nickel	7440-02-0	2	mg/kg		7	----	----	----	----
Zinc	7440-66-6	5	mg/kg		46	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC100	BLANK	SPIKE	TSC	----
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----	
Compound	CAS Number	LOR	Unit	EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----	
				Result	Result	Result	Result	----	
EP068A: Organochlorine Pesticides (OC) - Continued									
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----	
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----	
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----	
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----	
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	----	
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----	
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----	
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----	
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----	
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----	
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----	
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	----	
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/5 0-2	0.05	mg/kg	<0.05	----	----	----	----	
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----	
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----	
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----	
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----	
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----	
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----	
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----	
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----	
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----	
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----	
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----	
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----	
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----	
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----	
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----	
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----	
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----	
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----	
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----	
EP074A: Monocyclic Aromatic Hydrocarbons									



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				QC100	BLANK	SPIKE	TSC	----
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit	EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
				Result	Result	Result	Result	----
EP074A: Monocyclic Aromatic Hydrocarbons - Continued								
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	----	----	----	----
Styrene	100-42-5	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	----	----	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	----	----	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	----	----	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	----	----	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	----	----	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	----	----	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	----	----	----	----
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	----	----	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg	<5	----	----	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	----	----	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	----	----	----	----
EP074C: Sulfonated Compounds								
Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	----	----	----	----
EP074D: Fumigants								
2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	----	----	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	----	----	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	----	----	----	----
EP074E: Halogenated Aliphatic Compounds								
Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	----	----	----	----
Chloromethane	74-87-3	5	mg/kg	<5	----	----	----	----
Vinyl chloride	75-01-4	5	mg/kg	<5	----	----	----	----
Bromomethane	74-83-9	5	mg/kg	<5	----	----	----	----
Chloroethane	75-00-3	5	mg/kg	<5	----	----	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg	<5	----	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				QC100	BLANK	SPIKE	TSC	----
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit	EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
				Result	Result	Result	Result	----
EP074E: Halogenated Aliphatic Compounds - Continued								
1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	----	----	----	----
Iodomethane	74-88-4	0.5	mg/kg	<0.5	----	----	----	----
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	----	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	----	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	----	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	----	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	----	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	----	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	----	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	----	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	----	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	----	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	----	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	----	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	----	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	----	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	----	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	----	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	----	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	----	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	----	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	----	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	----	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC100	BLANK	SPIKE	TSC	----
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit		EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
					Result	Result	Result	Result	----
EP074G: Trihalomethanes - Continued									
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	----	----	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	----	----	----	----
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	----	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
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		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	82	111	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	95	123	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC100	BLANK	SPIKE	TSC	----
Client sampling date / time					18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit		EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
					Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	47	67	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	0.4	0.7	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	22.9	28.2	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	3.0	3.4	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	15.8	17.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	6.0	6.5	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	48.1	56.3	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	21.8	24.0	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	----
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		124	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		104	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		98.7	----	----	----	----
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%		87.1	----	----	----	----
Toluene-D8	2037-26-5	0.5	%		82.5	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.5	%		73.3	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		82.8	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		82.8	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		87.3	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		89.2	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		95.3	----	----	----	----



Analytical Results

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

Client sample ID

				QC100	BLANK	SPIKE	TSC	----
Client sampling date / time				18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	18-May-2017 00:00	----
Compound	CAS Number	LOR	Unit	EW1702227-016	EW1702227-018	EW1702227-019	EW1702227-020	-----
				Result	Result	Result	Result	----
EP075(SIM)T: PAH Surrogates - Continued								
4-Terphenyl-d14	1718-51-0	0.5	%	86.3	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	93.1	103	80.4	93.3	----
Toluene-D8	2037-26-5	0.2	%	82.8	98.3	78.7	88.9	----
4-Bromofluorobenzene	460-00-4	0.2	%	79.6	102	99.0	95.8	----



Analytical Results

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

Client sample ID

				QC300	----	----	----	----
Client sampling date / time				18-May-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EW1702227-017	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benzo(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----



Analytical Results

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

Client sample ID

				QC300	----	----	----	----
Client sampling date / time				18-May-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EW1702227-017	-----	-----	-----	-----
Result				----	----	----	----	----

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	----	----	----	----

EP080: BTEXN

Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----

EP075(SIM)S: Phenolic Compound Surrogates

Phenol-d6	13127-88-3	1	%	27.7	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%	59.5	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%	40.5	----	----	----	----

EP075(SIM)T: PAH Surrogates

2-Fluorobiphenyl	321-60-8	1	%	77.1	----	----	----	----
Anthracene-d10	1719-06-8	1	%	93.1	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	90.1	----	----	----	----

EP080S: TPH(V)/BTEX Surrogates

1,2-Dichloroethane-D4	17060-07-0	2	%	107	----	----	----	----
Toluene-D8	2037-26-5	2	%	103	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	97.2	----	----	----	----



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	CHA100_0.1 - 17-May-2017 00:00	Mid brown sandy soil.
EA200: Description	CTP100_0.1 - 17-May-2017 00:00	Mid brown clay soil.
EA200: Description	CTP101_0.1 - 17-May-2017 00:00	Mid brown clay soil.
EA200: Description	CTP102_0.1 - 17-May-2017 00:00	Mid brown clay soil.
EA200: Description	CTP103_0.1 - 17-May-2017 00:00	Mid brown clay soil.
EA200: Description	CTP104_0.1 - 17-May-2017 00:00	Mid brown clay soil.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

CHAIN OF CUSTODY

CLIENT:		Cardno		TURNAROUND REQUIREMENTS:		STANDARD TURNAROUND		FOR LABORATORY USE ONLY (SEE ONLY 10014)										
OFFICE:	Level 1, 47 Burrell St Wollongong NSW 2500	(But final TAT may be longer for some tests)	☐ Standard TAT (Use due date)	☐ Non Standard or urgent TAT (Use due date)	COC SEQUENCE NUMBER (Check)		Date of final report (if not available, please provide date of sample collection)											
PROJECT:	820714207-001-500	QUOTE NO.:	820714207-001-500		1	2	3	4	5	6	7							
ORDER NUMBER:		CONTACT PH:	0478 354 778		Off:	1	2	3	4	5	6	7						
PROJECT MANAGER:	Mich Blencowe	SAMPLER MOBILE:			DATE/TIME: 23/5/17													
SAMPLER:	MB	EDD FORMAT (or default):			DATE/TIME: 23/5/17													
COC emailed? (YES / NO)	YES				DATE/TIME: 23/5/17													
Email Reports to (will default to PM if no other addresses are listed): mich.blencowe@cardno.com.au				Email invoice to (will default to PM if no other addresses are listed): mich.blencowe@cardno.com.au				DATE/TIME: 23/5/17										
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Asbestos to be tested from double zip-lock bag; ASS field screening to be tested from single zip-lock bag; Suite P-22 to be tested from first jar; Contaminants to be tested from second jar																		
LAB USE ONLY		SAMPLE DETAILS		CONTAINER INFORMATION		ANALYSIS REQUIRED INCLUDING SUITES (NB: Suite Codes must be listed to attract suite price)						Additional Information						
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	Suite S-16 (TRH (C6-C9)/BTEXN/PAH/OC/OP/PCB, 8 Metals)	VOCs	Salinity (electrical conductivity and chloride)	Selenium & boron	BTEXN	Suite S-18 (TPH (C6-C9), TRH (C6-C10)/BTEXN plus P1	Asbestos (NEPM)	pH Field Screening	Suite P-22 (NEPM Screen for Soil Classification: Fe, CEC, pH(CaCl2), TOC, Clay Content)	Suite W-26 (TRH (C6-C40)/BTEXN/PAH plus 8 metals)	Place jar on hold	Please forward to Eurofins for analysis	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.	
1	CTP106_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X	X	X	X	X	X	X	X	X		
2	CTP106_0.5	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
3	CTP107_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X		X		X						
4	CTP107_0.5	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
5	CTP107_0.9	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
6	CTP108_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X		X		X						
7	CTP108_0.6	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
8	CTP109_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X		X		X						
9	CTP109_0.3	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
10	CTP110_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X		X		X						
11	CTP110_0.4	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
12	CTP111_0.1	22/05/2017	Soil	2 x jars; 2 x zip-lock bags	X	X	X	X		X		X						
13	CTP111_0.6	22/05/2017	Soil	1 x jars; 1 x zip-lock bags														
14	QC101	22/05/2017	Soil	1 x jar	X	X	X	X										
15	QC201	22/05/2017	Soil	1 x jar	X	X	X	X										
16	QC301	22/05/2017	Water	4 x bottles														
17	Blank	22/05/2017	Soil	2 x jars														
18	SPIKE	22/05/2017	Soil	1 x jar														
10014																		

Environmental Division
Wollongong
Work Order Reference
EW1702296

Barcode

Telephone: 02 42255125

Notes:
P = Unpreserved Plastic; N = Nitric Preserved Plastic; OC = Nitric Preserved Plastic; ST = Soil in Hydrochloric Acid; S = Soil in Hydrochloric Acid; F = Formaldehyde Preserved Glass;
V = VOA Vol HCl Preserved; VA = VOA Vol Sodium Bisulfate Preserved; VS = VOA Vol Sodium Bisulfate Preserved; AV = Aldehyde Unpreserved Vol; SG = Sulfide Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Specimen bottle; SP = Sulfide Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Stable Bottle; ASS = Plastic Bag for Acid-Soluble Solids; U = Unpreserved Bag.

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EW1702296	Page	: 1 of 13
Amendment	: 1		
Client	: CARDNO (NSW/ACT)	Laboratory	: Environmental Division NSW South Coast
Contact	: Mitch Blencowe	Telephone	: 02 42253125
Project	: 8201714201-001-600	Date Samples Received	: 23-May-2017
Site	: ----	Issue Date	: 30-Jun-2017
Sampler	: Mitch Blencowe	No. of samples received	: 18
Order number	: ----	No. of samples analysed	: 18

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO** Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

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



Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	3	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	3	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA001: pH in soil using 0.01M CaCl extract							
Soil Glass Jar - Unpreserved (EA001)	22-May-2017	29-May-2017	29-May-2017	✔	29-May-2017	29-May-2017	✔
CHA101_0.1, CHA102_0.1,							
CHA103_0.1, CHA104_0.1,							
CHA105_0.1, CHA106_0.1							
EA010: Conductivity							
Soil Glass Jar - Unpreserved (EA010)	22-May-2017	26-May-2017	29-May-2017	✔	26-May-2017	23-Jun-2017	✔
CHA101_0.1, CHA102_0.1,							
CHA103_0.1, CHA104_0.1,							
CHA105_0.1, CHA106_0.1,							
QC101							
EA037: Ass Field Screening Analysis							
Snap Lock Bag - frozen on receipt at ALS (EA037)	22-May-2017	08-Jun-2017	18-Nov-2017	✔	08-Jun-2017	18-Nov-2017	✔
CHA101_0.5, CHA102_0.5,							
CHA102_0.9, CHA103_0.6,							
CHA104_0.3, CHA105_0.4,							
CHA106_0.6							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055)		22-May-2017	----	----	----	24-May-2017	05-Jun-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101, SPIKE,	CHA102_0.1, CHA104_0.1, CHA106_0.1, BLANK, TSC							
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H)		22-May-2017	----	----	----	31-May-2017	18-Nov-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1,	CHA102_0.1, CHA104_0.1, CHA106_0.1							
EA152: Soil Particle Density								
Snap Lock Bag (EA152)		22-May-2017	----	----	----	31-May-2017	18-Nov-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1,	CHA102_0.1, CHA104_0.1, CHA106_0.1							
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Snap Lock Bag (EA200)		22-May-2017	----	----	----	26-May-2017	18-Nov-2017	✓
CHA101_0.1								
Snap Lock Bag (EA200)		22-May-2017	----	----	----	29-May-2017	18-Nov-2017	✓
CHA102_0.1, CHA104_0.1, CHA106_0.1	CHA103_0.1, CHA105_0.1,							
ED007: Exchangeable Cations								
Soil Glass Jar - Unpreserved (ED007)		22-May-2017	30-May-2017	19-Jun-2017	✓	30-May-2017	19-Jun-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1,	CHA102_0.1, CHA104_0.1, CHA106_0.1							
ED045G: Chloride by Discrete Analyser								
Soil Glass Jar - Unpreserved (ED045G)		22-May-2017	26-May-2017	19-Jun-2017	✓	26-May-2017	23-Jun-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)		22-May-2017	28-May-2017	18-Nov-2017	✓	29-May-2017	18-Nov-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,							



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Evaluation	Holding time breakdown		
Container / Client Sample ID(s)			Date extracted	Due for extraction		Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS									
Soil Glass Jar - Unpreserved (EG035T)		22-May-2017	28-May-2017	19-Jun-2017		✓	29-May-2017	19-Jun-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP004: Organic Matter									
Soil Glass Jar - Unpreserved (EP004)		22-May-2017	29-May-2017	19-Jun-2017		✓	29-May-2017	19-Jun-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP066: Polychlorinated Biphenyls (PCB)									
Soil Glass Jar - Unpreserved (EP066)		22-May-2017	25-May-2017	05-Jun-2017		✓	25-May-2017	04-Jul-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP068A: Organochlorine Pesticides (OC)									
Soil Glass Jar - Unpreserved (EP068)		22-May-2017	25-May-2017	05-Jun-2017		✓	25-May-2017	04-Jul-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP068B: Organophosphorus Pesticides (OP)									
Soil Glass Jar - Unpreserved (EP068)		22-May-2017	25-May-2017	05-Jun-2017		✓	25-May-2017	04-Jul-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP074A: Monocyclic Aromatic Hydrocarbons									
Soil Glass Jar - Unpreserved (EP074)		22-May-2017	25-May-2017	29-May-2017		✓	26-May-2017	29-May-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								
EP074B: Oxygenated Compounds									
Soil Glass Jar - Unpreserved (EP074)		22-May-2017	25-May-2017	29-May-2017		✓	26-May-2017	29-May-2017	✓
CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1								

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP074C: Sulfonated Compounds								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP074D: Fumigants								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP074E: Halogenated Aliphatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP074F: Halogenated Aromatic Compounds								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP074G: Trihalomethanes								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP074H: Naphthalene								
Soil Glass Jar - Unpreserved (EP074) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	29-May-2017	✓	26-May-2017	29-May-2017	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM)) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	25-May-2017	04-Jul-2017	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	25-May-2017	04-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP080) SPIKE,	TSC	22-May-2017	29-May-2017	05-Jun-2017	✓	29-May-2017	05-Jun-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	25-May-2017	04-Jul-2017	✓
Soil Glass Jar - Unpreserved (EP080) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP080) SPIKE,	TSC	22-May-2017	29-May-2017	05-Jun-2017	✓	29-May-2017	05-Jun-2017	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) CHA101_0.1, CHA103_0.1, CHA105_0.1, QC101	CHA102_0.1, CHA104_0.1, CHA106_0.1,	22-May-2017	25-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓
Soil Glass Jar - Unpreserved (EP080) BLANK, TSC	SPIKE,	22-May-2017	29-May-2017	05-Jun-2017	✓	29-May-2017	05-Jun-2017	✓

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC301	22-May-2017	26-May-2017	18-Nov-2017	✓	26-May-2017	18-Nov-2017	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC301	22-May-2017	----	----	----	26-May-2017	19-Jun-2017	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC301	22-May-2017	24-May-2017	29-May-2017	✓	24-May-2017	03-Jul-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC301	22-May-2017	24-May-2017	29-May-2017	✓	24-May-2017	03-Jul-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC301	22-May-2017	26-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC301	22-May-2017	24-May-2017	29-May-2017	✓	24-May-2017	03-Jul-2017	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC301	22-May-2017	26-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC301	22-May-2017	26-May-2017	05-Jun-2017	✓	26-May-2017	05-Jun-2017	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride Soluble By Discrete Analyser	ED045G	3	23	13.04	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	27	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH in soil using a 0.01M CaCl2 extract	EA001	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	18	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	3	28	10.71	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Chloride Soluble By Discrete Analyser	ED045G	4	23	17.39	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	28	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride Soluble By Discrete Analyser	ED045G	2	23	8.70	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Electrical Conductivity (1:5)	EA010	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Exchangeable Cations	ED007	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.50	5.00	✓	NEPM 2013 B3 & ALS QC Standard



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	
Method Blanks (MB) - Continued							
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	28	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride Soluble By Discrete Analyser	ED045G	2	23	8.70	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Organic Matter	EP004	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	15	6.67	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	1	8	12.50	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	5.26	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	18	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	28	7.14	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Volatile Organic Compounds	EP074	1	9	11.11	5.00	✔	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

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)	0	7	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	3	66.67	10.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	3	0.00	10.00	✖	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✔	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	7	14.29	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	33.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	7	0.00	5.00	✖	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Matrix Spikes (MS) - Continued							
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	3	0.00	5.00	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001	SOIL	In house: Referenced to Rayment and Lyons 4B3 (mod.) or 4B4 (mod.) 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3)
Electrical Conductivity (1:5)	EA010	SOIL	In house: Referenced to Rayment and Lyons 3A1 and APHA 2510. Conductivity is determined on soil samples using a 1:5 soil/water leach. This method is compliant with NEPM (2013) Schedule B(3)
Total Soluble Salts	EA014	SOIL	In house: The concentration of Total Soluble Salts in a soil is calculated from the Electrical conductivity of a water extract. This method is compliant with NEPM (2013) Schedule B(3) (Method 104)
ASS Field Screening Analysis	* EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines, version 2.1 June 2004. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Soil Particle Density	* EA152	SOIL	Soil Particle Density by AS 1289.3.5.1-2006 : Methods of testing soils for engineering purposes - Soil classification tests - Determination of the soil particle density of a soil - Standard method
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Exchangeable Cations	ED007	SOIL	In house: Referenced to Rayment & Lyons (2011) Method 15A1. Cations are exchanged from the sample by contact with Ammonium Chloride. They are then quantitated in the final solution by ICPAES and reported as meq/100g of original soil. This method is compliant with NEPM (2013) Schedule B(3) (Method 301)
Chloride Soluble By Discrete Analyser	ED045G	SOIL	In house: Referenced to APHA 4500-Cl- E. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm. Analysis is performed on a 1:5 soil / water leachate.
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Organic Matter	EP004	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3).
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504)



Analytical Methods	Method	Matrix	Method Descriptions
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D 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 (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
Volatile Organic Compounds	EP074	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to 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. Compliant with NEPM amended 2013.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(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 SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
Preparation Methods	Method	Matrix	Method Descriptions
pH in soil using a 0.01M CaCl ₂ extract	EA001-PR	SOIL	In house: Referenced to Rayment and Higginson 4B1, 10 g of soil is mixed with 50 mL of 0.01M CaCl ₂ and tumbled end over end for 1 hour. pH is measured from the continuous suspension. This method is compliant with NEPM (2013) Schedule B(3) (Method 103)
Exchangeable Cations Preparation Method	ED007PR	SOIL	In house: Referenced to Rayment & Higginson (1992) method 15A1. A 1M NH ₄ Cl extraction by end over end tumbling at a ratio of 1:20. There is no pretreatment for soluble salts. Extracts can be run by ICP for cations.
Drying only	EN020D	SOIL	In house



Preparation Methods	Method	Matrix	Method Descriptions
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of reagent grade water and tumbled end over end for 1 hour. Water soluble salts are leached from the soil by the continuous suspension. Samples are settled and the water filtered off for analysis.
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	In house: Referenced to AS1289.4.1.1 - 1997. Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (2013) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

QUALITY CONTROL REPORT

Work Order : **EW1702296**

Page : 1 of 20

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Contact : Mitch Blencowe

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Telephone : +61 02 9496 7700

Project : 8201714201-001-600

Order number : ----

C-O-C number : ----

Sampler : Mitch Blencowe

Site : ----

Quote number : EN/024/16

No. of samples received : 18

No. of samples analysed : 18

Laboratory : Environmental Division NSW South Coast

Contact : Glenn Davies

Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW

Telephone : 02 42253125

Date Samples Received : 23-May-2017

Date Analysis Commenced : 24-May-2017

Issue Date : 30-Jun-2017



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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
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Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA001: pH in soil using 0.01M CaCl extract (QC Lot: 912952)									
EW1702296-010	CHA105_0.1	EA001: pH (CaCl2)	----	0.1	pH Unit	5.2	5.2	0.00	0% - 20%
EA010: Conductivity (QC Lot: 908066)									
ES1712597-001	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	18	16	9.01	0% - 50%
ES1712597-010	Anonymous	EA010: Electrical Conductivity @ 25°C	----	1	µS/cm	16	17	0.00	0% - 50%
EA037: Ass Field Screening Analysis (QC Lot: 913757)									
EW1702296-002	CHA101_0.5	EA037: pH (F)	----	0.1	pH Unit	6.7	6.6	0.00	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	5.4	5.3	0.00	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 906299)									
ES1712314-018	Anonymous	EA055: Moisture Content	----	1	%	23.3	22.5	3.67	0% - 20%
ES1712314-029	Anonymous	EA055: Moisture Content	----	1	%	11.1	11.1	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 906300)									
EW1702296-008	CHA104_0.1	EA055: Moisture Content	----	1	%	24.6	24.4	0.755	0% - 20%
ED007: Exchangeable Cations (QC Lot: 916550)									
ES1712314-003	Anonymous	ED007: Calcium/Magnesium Ratio	----	0.1	-	0.3	0.3	0.00	No Limit
		ED007: Magnesium/Potassium Ratio	----	0.1	-	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Calcium Percent	----	0.1	%	27.5	27.2	1.06	0% - 20%
		ED007: Exchangeable Magnesium Percent	----	0.1	%	70.5	70.8	0.445	0% - 20%
		ED007: Exchangeable Potassium Percent	----	0.1	%	1.9	1.9	0.00	0% - 50%
		ED007: Exchangeable Sodium Percent	----	0.1	%	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Calcium	----	0.1	meq/100g	0.3	0.3	0.00	No Limit
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	0.9	0.9	0.00	No Limit
		ED007: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	1.2	1.2	0.00	0% - 50%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED007: Exchangeable Cations (QC Lot: 916550) - continued									
ES1712314-003	Anonymous	ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
EW1702296-001	CHA101_0.1	ED007: Calcium/Magnesium Ratio	----	0.1	-	2.1	2.1	0.00	0% - 20%
		ED007: Magnesium/Potassium Ratio	----	0.1	-	7.5	7.4	0.00	0% - 20%
		ED007: Exchangeable Calcium Percent	----	0.1	%	64.5	64.5	0.00	0% - 20%
		ED007: Exchangeable Magnesium Percent	----	0.1	%	30.6	30.6	0.00	0% - 20%
		ED007: Exchangeable Potassium Percent	----	0.1	%	4.1	4.1	0.00	0% - 20%
		ED007: Exchangeable Sodium Percent	----	0.1	%	0.8	0.8	0.00	No Limit
		ED007: Exchangeable Calcium	----	0.1	meq/100g	7.7	7.7	0.00	0% - 20%
		ED007: Exchangeable Magnesium	----	0.1	meq/100g	3.7	3.6	0.00	0% - 20%
		ED007: Exchangeable Potassium	----	0.1	meq/100g	0.5	0.5	0.00	No Limit
		ED007: Exchangeable Sodium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
		ED007: Cation Exchange Capacity	----	0.1	meq/100g	12.0	12.0	0.00	0% - 20%
		ED007: Exchangeable Aluminium	----	0.1	meq/100g	<0.1	<0.1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 908067)									
ES1712597-001	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.00	No Limit
ES1712597-010	Anonymous	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 908069)									
EW1702296-010	CHA105_0.1	ED045G: Chloride	16887-00-6	10	mg/kg	<10	<10	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 912703)									
ES1712784-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	9	26.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	17	49.2	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	17	20	16.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	16	39.6	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	11	11	0.00	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	19800	21600	8.44	0% - 20%
EW1702051-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	12	44.2	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	10	0.00	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	84	94	11.3	0% - 50%
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	780	630	20.7	0% - 50%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 912704)									
ES1712784-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EW1702051-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP004: Organic Matter (QC Lot: 913088)									
ES1712874-003	Anonymous	EP004: Organic Matter	----	0.5	%	<0.5	<0.5	0.00	No Limit
		EP004: Total Organic Carbon	----	0.5	%	<0.5	<0.5	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 905130)									
ES1712528-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 905129)									
ES1712528-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 905129)									
ES1712528-001	Anonymous	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 905129) - continued									
ES1712528-001	Anonymous	EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit		
EP074A: Monocyclic Aromatic Hydrocarbons (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074B: Oxygenated Compounds (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	<5	0.00	No Limit
		EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	<5	0.00	No Limit
EP074C: Sulfonated Compounds (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074D: Fumigants (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074E: Halogenated Aliphatic Compounds (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: 1.1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloromethane	74-87-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Bromomethane	74-83-9	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Chloroethane	75-00-3	5	mg/kg	<5	<5	0.00	No Limit
		EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	<5	0.00	No Limit
EP074F: Halogenated Aromatic Compounds (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: 1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074G: Trihalomethanes (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP074G: Trihalomethanes (QC Lot: 907316) - continued									
EW1702296-001	CHA101_0.1	EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP074H: Naphthalene (QC Lot: 907316)									
EW1702296-001	CHA101_0.1	EP074: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 905127)									
EW1702296-006	CHA103_0.1	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1712528-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			205-82-3						
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 905127) - continued									
ES1712528-001	Anonymous	EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 905128)									
EW1702296-006	CHA103_0.1	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1712528-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 907317)									
EW1702296-001	CHA101_0.1	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 912503)									
EB1710628-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1712874-003	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	22	19	14.7	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 905128)									
EW1702296-006	CHA103_0.1	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1712528-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 907317)									
EW1702296-001	CHA101_0.1	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 912503)									
EB1710628-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1712874-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	58	50	14.0	No Limit
EP080: BTEXN (QC Lot: 907317)									
EW1702296-001	CHA101_0.1	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 912503)									



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 912503) - continued									
EB1710628-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1712874-003	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 910442)									
EW1702292-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.014	0.013	0.00	No Limit
ME1700714-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.035	0.037	5.70	No Limit

EG035T: Total Recoverable Mercury by FIMS (QC Lot: 908076)									
ES1712440-015	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
ES1712473-008	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

EP080/071: Total Petroleum Hydrocarbons (QC Lot: 908882)									
ES1712477-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1712500-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 908882)									
ES1712477-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 908882) - continued									
ES1712500-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 908882)									
ES1712477-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
ES1712500-003	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

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 Spike (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.

Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
	Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
		LCS	Low	High
Result				
<1	1412 µS/cm	92.5	92	108
<0.1	1 meq/100g	101	76	122
<0.1	1.67 meq/100g	98.2	76	118
<0.1	0.51 meq/100g	107	80	120
<0.1	0.87 meq/100g	107	80	120
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<0.1	----	----	----	----
<10	50 mg/kg	102	75	125
<10	5000 mg/kg	89.6	79	117
<10	50 mg/kg	102	75	125
<10	5000 mg/kg	89.6	79	117
<5	21.7 mg/kg	102	86	126
<50	----	----	----	----
<1	4.64 mg/kg	102	83	113
<2	43.9 mg/kg	106	76	128
<5	32 mg/kg	98.3	86	120
<50	8400 mg/kg	92.1	70	130
<5	40 mg/kg	102	80	114
<2	55 mg/kg	109	87	123
<5	5.37 mg/kg	104	75	131
<5	60.8 mg/kg	115	80	122
<0.1	2.57 mg/kg	74.4	70	105



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP004: Organic Matter (QCLot: 913088) - continued								
EP004: Organic Matter	----	0.5	%	<0.5	2.53 %	97.9	82	98
EP004: Total Organic Carbon	----	0.5	%	<0.5	1.46 %	97.8	81	99
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 905130)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	84.0	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 905129)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	104	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	101	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	106	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.2	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	78.2	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	90.6	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	66	116
EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.0	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	85.7	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	69	115
EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	101	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	100.0	62	124
EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	86.9	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	99.1	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	80.4	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 905129)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	82.8	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	98.3	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	83.4	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	92.6	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	85.8	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	85.8	64	122

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 905129) - continued								
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.6	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	90.2	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.4	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.0	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	102	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	68.8	41	123
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 907316)								
EP074: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	111	71	121
EP074: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	115	65	131
EP074: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	104	72	114
EP074: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	104	70	116
	106-42-3							
EP074: Styrene	100-42-5	0.5	mg/kg	<0.5	1 mg/kg	95.1	67	113
EP074: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	105	75	115
EP074: Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	1 mg/kg	102	65	117
EP074: n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	1 mg/kg	99.6	66	122
EP074: 1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	1 mg/kg	99.6	68	118
EP074: sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	1 mg/kg	101	69	119
EP074: 1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	1 mg/kg	97.9	69	117
EP074: tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	1 mg/kg	103	69	115
EP074: p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	1 mg/kg	98.9	66	118
EP074: n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	1 mg/kg	91.1	59	125
EP074B: Oxygenated Compounds (QCLot: 907316)								
EP074: Vinyl Acetate	108-05-4	5	mg/kg	<5	10 mg/kg	30.6	30	156
EP074: 2-Butanone (MEK)	78-93-3	5	mg/kg	<5	10 mg/kg	102	58	136
EP074: 4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg	<5	10 mg/kg	98.5	62	132
EP074: 2-Hexanone (MBK)	591-78-6	5	mg/kg	<5	10 mg/kg	96.3	54	136
EP074C: Sulfonated Compounds (QCLot: 907316)								
EP074: Carbon disulfide	75-15-0	0.5	mg/kg	<0.5	1 mg/kg	81.9	54	126
EP074D: Fumigants (QCLot: 907316)								
EP074: 2,2-Dichloropropane	594-20-7	0.5	mg/kg	<0.5	1 mg/kg	102	60	126
EP074: 1,2-Dichloropropane	78-87-5	0.5	mg/kg	<0.5	1 mg/kg	107	68	124
EP074: cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg	<0.5	1 mg/kg	85.8	51	119
EP074: trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg	<0.5	1 mg/kg	84.6	52	114
EP074: 1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg	<0.5	1 mg/kg	91.9	63	115
EP074E: Halogenated Aliphatic Compounds (QCLot: 907316)								

Method Blank (MB) Report

Spike

Spike Recovery (%)

Recovery Limits (%)

Result

Concentration

LCS

Low

High

EP074: Dichlorodifluoromethane	75-71-8	5	mg/kg	<5	10 mg/kg	64.7	30	148
EP074: Chloromethane	74-87-3	5	mg/kg	<5	10 mg/kg	97.2	41	141
EP074: Vinyl chloride	75-01-4	5	mg/kg	<5	10 mg/kg	101	43	147
EP074: Bromomethane	74-83-9	5	mg/kg	<5	10 mg/kg	105	47	141
EP074: Chloroethane	75-00-3	5	mg/kg	<5	10 mg/kg	110	49	143
EP074: Trichlorofluoromethane	75-69-4	5	mg/kg	<5	10 mg/kg	118	49	135
EP074: 1,1-Dichloroethene	75-35-4	0.5	mg/kg	<0.5	1 mg/kg	103	54	126
EP074: Iodomethane	74-88-4	0.5	mg/kg	<0.5	1 mg/kg	84.0	43	129
EP074: trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	1 mg/kg	112	64	120
EP074: 1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	1 mg/kg	106	67	125
EP074: cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	1 mg/kg	108	69	121
EP074: 1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	1 mg/kg	100	65	117
EP074: 1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	1 mg/kg	107	65	123
EP074: Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	1 mg/kg	94.7	59	125
EP074: 1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	1 mg/kg	106	65	125
EP074: Trichloroethene	79-01-6	0.5	mg/kg	<0.5	1 mg/kg	108	70	118
EP074: Dibromomethane	74-95-3	0.5	mg/kg	<0.5	1 mg/kg	94.3	68	118
EP074: 1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	1 mg/kg	103	64	126
EP074: 1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	1 mg/kg	105	68	122
EP074: Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	1 mg/kg	110	67	143
EP074: 1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	1 mg/kg	87.8	62	122
EP074: trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	1 mg/kg	86.2	54	128
EP074: cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	1 mg/kg	82.0	55	129
EP074: 1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	1 mg/kg	90.0	65	121
EP074: 1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	1 mg/kg	102	61	125
EP074: Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	1 mg/kg	59.3	20	134
EP074: 1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	1 mg/kg	77.8	53	129
EP074: Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	1 mg/kg	100	50	128

EP074: Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	1 mg/kg	108	68	116
EP074: Bromobenzene	108-86-1	0.5	mg/kg	<0.5	1 mg/kg	99.4	70	114
EP074: 2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	1 mg/kg	103	68	122
EP074: 4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	1 mg/kg	99.2	67	123
EP074: 1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	1 mg/kg	98.4	70	116
EP074: 1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	1 mg/kg	99.8	67	117
EP074: 1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	1 mg/kg	100	70	114
EP074: 1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	1 mg/kg	85.4	48	122
EP074: 1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	1 mg/kg	94.2	52	122

EP074G: Trihalomethanes (QCLot: 907316)



Sub-Matrix: **SOIL**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
							Low	High
CAS Number	LOR	Unit						
EP074G: Trihalomethanes (QCLot: 907316) - continued								
EP074: Chloroform	67-66-3	0.5	mg/kg	<0.5	1 mg/kg	105	66	124
EP074: Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	1 mg/kg	88.2	61	121
EP074: Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	1 mg/kg	82.4	63	121
EP074: Bromoform	75-25-2	0.5	mg/kg	<0.5	1 mg/kg	83.6	60	126
EP074H: Naphthalene (QCLot: 907316)								
EP074: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	104	67	129
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 905127)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	84.8	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	82.2	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	82.0	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	84.3	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	80.7	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	77.2	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	80.5	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	84.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	80.4	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	82.0	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	6 mg/kg	82.2	68	116
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	82.4	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	80.6	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	80.8	61	121
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	75.9	62	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	83.7	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 905128)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.7	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	101	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	97.0	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 907317)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	110	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 912503)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	112	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 905128)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	98.9	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	89.7	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 907317)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	106	68	128



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 912503)									
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	113	68	128	
EP080: BTEXN (QCLot: 907317)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	109	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	120	67	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	106	65	117	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	106	66	118	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	68	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.6	63	119	
EP080: BTEXN (QCLot: 912503)									
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	109	62	116	
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	97.7	67	121	
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	93.8	65	117	
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	95.2	66	118	
	106-42-3								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	98.0	68	120	
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.3	63	119	
Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 910442)									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	82	114	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	84	112	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.0	86	116	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.7	83	118	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.7	85	115	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	90.5	84	116	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.2	79	117	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 908076)									
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.2	77	111	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 905104)									
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	77.5	50	94	
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	80.0	64	114	
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	83.2	62	113	
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	75.0	64	115	
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	69.8	63	116	
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	86.6	64	116	
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	86.4	64	118	



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 905104) - continued								
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	92.9	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	69.9	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	77.6	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	1	µg/L	<1.0	5 µg/L	74.6	62	119
	205-82-3							
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	80.1	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	72.5	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	72.6	60	118
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	77.5	61	117
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	70.4	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 905103)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	95.2	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	100	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	104	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 908882)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	88.2	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 905103)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	101	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	99.8	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	102	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 908882)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	88.6	75	127
EP080: BTEXN (QCLot: 908882)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	93.7	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	95.9	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	92.0	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	89.2	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	94.8	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	95.4	70	120

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) LowHigh	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number				
ED045G: Chloride by Discrete Analyser (QCLot: 908067)							
ES1712597-001	Anonymous	ED045G: Chloride	16887-00-6	1250 mg/kg	102	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 908069)							
EW1702296-010	CHA105_0.1	ED045G: Chloride	16887-00-6	1250 mg/kg	108	70	130
EG005T: Total Metals by ICP-AES (QCLot: 912703)							
ES1712784-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	94.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.3	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	97.2	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.7	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	100	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 912704)							
ES1712784-003	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	89.8	70	130
EP004: Organic Matter (QCLot: 913088)							
ES1712874-003	Anonymous	EP004: Organic Matter	----	4.58 %	95.6	70	130
		EP004: Total Organic Carbon	----	2.66 %	95.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 905130)							
ES1712528-001	Anonymous	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	92.0	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 905129)							
ES1712528-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	96.4	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	98.1	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	92.3	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	101	70	130
		EP068: Endrin	72-20-8	2 mg/kg	92.8	70	130
		EP068: 4,4`-DDT	50-29-3	2 mg/kg	93.4	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 905129)							
ES1712528-001	Anonymous	EP068: Diazinon	333-41-5	0.5 mg/kg	107	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	105	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	104	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	102	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	103	70	130
EP074A: Monocyclic Aromatic Hydrocarbons (QCLot: 907316)							
EW1702296-001	CHA101_0.1	EP074: Benzene	71-43-2	2.5 mg/kg	88.8	70	130
		EP074: Toluene	108-88-3	2.5 mg/kg	92.8	70	130
EP074E: Halogenated Aliphatic Compounds (QCLot: 907316)							
EW1702296-001	CHA101_0.1	EP074: 1,1-Dichloroethene	75-35-4	2.5 mg/kg	72.4	70	130



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP074E: Halogenated Aliphatic Compounds (QCLot: 907316) - continued							
EW1702296-001	CHA101_0.1	EP074: Trichloroethene	79-01-6	2.5 mg/kg	76.0	70	130
EP074F: Halogenated Aromatic Compounds (QCLot: 907316)							
EW1702296-001	CHA101_0.1	EP074: Chlorobenzene	108-90-7	2.5 mg/kg	92.8	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 905127)							
ES1712528-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.5	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 905128)							
ES1712528-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	89.6	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	108	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	122	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 907317)							
EW1702296-001	CHA101_0.1	EP080: C6 - C9 Fraction	----	32.5 mg/kg	104	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 912503)							
EB1710628-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	112	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 905128)							
ES1712528-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	95.7	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	116	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	115	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 907317)							
EW1702296-001	CHA101_0.1	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	100	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 912503)							
EB1710628-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	70	130
EP080: BTEXN (QCLot: 907317)							
EW1702296-001	CHA101_0.1	EP080: Benzene	71-43-2	2.5 mg/kg	87.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	93.4	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.2	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	92.1	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	89.3	70	130
	EP080: Naphthalene	91-20-3	2.5 mg/kg	75.5	70	130	
EP080: BTEXN (QCLot: 912503)							
EB1710628-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	109	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	95.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	98.6	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	99.6	70	130
			106-42-3				



Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080: BTEXN (QCLot: 912503) - continued							
EB1710628-001	Anonymous	EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	92.6	70	130
Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 910442)							
EW1702292-004	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	108	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	111	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.2	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	103	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	102	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	98.2	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	108	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 908076)							
ES1712440-037	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	83.1	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 908882)							
ES1712477-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	88.9	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 908882)							
ES1712477-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	86.7	70	130
EP080: BTEXN (QCLot: 908882)							
ES1712477-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	77.3	70	130
		EP080: Toluene	108-88-3	25 µg/L	72.6	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	79.5	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	74.3	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	79.5	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	94.8	70	130

CERTIFICATE OF ANALYSIS

Work Order : **EW1702296**

Amendment : **1**

Client : **CARDNO (NSW/ACT)**

Contact : Mitch Blencowe

Address : PO Box 1285 Level 1, 47 Burelli Street
Wollongong 2500

Telephone : +61 02 9496 7700

Project : 8201714201-001-600

Order number : ----

C-O-C number : ----

Sampler : Mitch Blencowe

Site : ----

Quote number : EN/024/16

No. of samples received : 18

No. of samples analysed : 18

Page : 1 of 33

Laboratory : Environmental Division NSW South Coast

Contact : Glenn Davies

Address : 1/19 Ralph Black Dr, North Wollongong 2500
4/13 Geary Pl, North Nowra 2541
Australia NSW

Telephone : 02 42253125

Date Samples Received : 23-May-2017 15:43

Date Analysis Commenced : 24-May-2017

Issue Date : 30-Jun-2017 10:02



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

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

This Certificate of Analysis contains the following information:

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

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

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Dianne Blane	Laboratory Coordinator (2IC)	Newcastle - Inorganics, Mayfield West, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Gerrad Morgan	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Acid Sulphate Soils, Stafford, QLD
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

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

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

- EA150H: Soil particle density results fell outside the scope of AS1289.3.6.3. Results should be scrutinised accordingly.
- Amendment (30/06/2017): This report has been amended as a result of a request to change sample identification numbers (IDs) received by ALS from Mitch Blencowe on 30/06/2017. All analysis results are as per the previous report.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR.
Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenzo(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- ED007 and ED008: When Exchangeable Al is reported from these methods, it should be noted that Rayment & Lyons (2011) suggests Exchange Acidity by 1M KCl - Method 15G1 (ED005) is a more suitable method for the determination of exchange acidity (H+ + Al3+).
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.



- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
 - EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.
-

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005	
				Result	Result	Result	Result	Result	
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit	5.1	----	5.4	----	----	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	16	----	15	----	----	
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg	52	----	49	----	----	
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit	----	6.7	----	7.4	7.7	
ø pH (Fox)	----	0.1	pH Unit	----	5.4	----	5.6	5.7	
ø Reaction Rate	----	1	-	----	2	----	2	2	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	21.9	----	22.3	----	----	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	22	----	24	----	----	
EA152: Soil Particle Density									
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.32	----	2.29	----	----	
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg	No	----	No	----	----	
Asbestos Type	1332-21-4	-	--	-	----	-	----	----	
Sample weight (dry)	----	0.01	g	427	----	473	----	----	
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	----	G.MORGAN	----	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	7.7	----	14.2	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	3.7	----	7.0	----	----	
Exchangeable Potassium	----	0.1	meq/100g	0.5	----	0.3	----	----	
Exchangeable Sodium	----	0.1	meq/100g	<0.1	----	0.3	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	12.0	----	21.8	----	----	
Exchangeable Aluminium	----	0.1	meq/100g	<0.1	----	<0.1	----	----	
Exchangeable Sodium Percent	----	0.1	%	0.8	----	1.2	----	----	
Exchangeable Magnesium Percent	----	0.1	%	30.6	----	32.1	----	----	
Exchangeable Potassium Percent	----	0.1	%	4.1	----	1.6	----	----	
Exchangeable Calcium Percent	----	0.1	%	64.5	----	65.0	----	----	
Calcium/Magnesium Ratio	----	0.1	-	2.1	----	2.0	----	----	
Magnesium/Potassium Ratio	----	0.1	-	7.5	----	20.1	----	----	
ED045G: Chloride by Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
					Result	Result	Result	Result	Result
ED045G: Chloride by Discrete Analyser - Continued									
Chloride	16887-00-6	10	mg/kg		<10	----	20	----	----
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	----
Iron	7439-89-6	0.005	%		4.06	----	3.95	----	----
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	----
Arsenic	7440-38-2	5	mg/kg		<5	----	<5	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	----
Chromium	7440-47-3	2	mg/kg		25	----	23	----	----
Copper	7440-50-8	5	mg/kg		100	----	78	----	----
Lead	7439-92-1	5	mg/kg		17	----	10	----	----
Nickel	7440-02-0	2	mg/kg		12	----	11	----	----
Zinc	7440-66-6	5	mg/kg		80	----	59	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	<0.1	----	----
EP004: Organic Matter									
Organic Matter	----	0.5	%		5.5	----	5.5	----	----
Total Organic Carbon	----	0.5	%		3.2	----	3.2	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	----
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	<0.05	----	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
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	----	----
Styrene	100-42-5	0.5	mg/kg		<0.5	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	<0.5	----	----
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	<0.5	----	----
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	<0.5	----	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	<0.5	----	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	<0.5	----	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	<0.5	----	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	<0.5	----	----
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	<5	----	----
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	<5	----	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	<5	----	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	<5	----	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	<0.5	----	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	<0.5	----	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	<0.5	----	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	<5	----	----
Chloromethane	74-87-3	5	mg/kg		<5	----	<5	----	----
Vinyl chloride	75-01-4	5	mg/kg		<5	----	<5	----	----
Bromomethane	74-83-9	5	mg/kg		<5	----	<5	----	----
Chloroethane	75-00-3	5	mg/kg		<5	----	<5	----	----
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	<5	----	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	<0.5	----	----
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	<0.5	----	----
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	<0.5	----	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	<0.5	----	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	<0.5	----	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	<0.5	----	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	<0.5	----	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	<0.5	----	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	<0.5	----	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	<0.5	----	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	0.6	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	1.2	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - 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	----	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	----	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	----	
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	----	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	----	----	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	----	----	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	----	----	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	----	----	
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	----	----	
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	----	----	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	129	----	108	----	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	114	----	102	----	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	99.7	----	90.7	----	----	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%	89.7	----	87.7	----	----	
Toluene-D8	2037-26-5	0.5	%	84.8	----	89.2	----	----	
4-Bromofluorobenzene	460-00-4	0.5	%	91.8	----	89.9	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	87.6	----	86.3	----	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	85.0	----	82.6	----	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	77.2	----	74.8	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	88.5	----	87.6	----	----	
Anthracene-d10	1719-06-8	0.5	%	83.0	----	83.0	----	----	
4-Terphenyl-d14	1718-51-0	0.5	%	93.2	----	91.8	----	----	
EP080S: TPH(V)/BTEX Surrogates									



Analytical Results

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

Client sample ID

				CHA101_0.1	CHA101_0.5	CHA102_0.1	CHA102_0.5	CHA102_0.9
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-001	EW1702296-002	EW1702296-003	EW1702296-004	EW1702296-005
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	89.7	----	87.5	----	----
Toluene-D8	2037-26-5	0.2	%	79.2	----	83.2	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	73.0	----	74.6	----	----

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID		CHA103_0.1		CHA103_0.6		CHA104_0.1		CHA104_0.3		CHA105_0.1	
Client sampling date / time				22-May-2017 00:00		22-May-2017 00:00		22-May-2017 00:00		22-May-2017 00:00		22-May-2017 00:00		22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-006		EW1702296-007		EW1702296-008		EW1702296-009		EW1702296-010			
				Result		Result		Result		Result		Result			
EA001: pH in soil using 0.01M CaCl extract															
pH (CaCl2)	----	0.1	pH Unit	5.2		----		5.1		----		5.2			
EA010: Conductivity															
Electrical Conductivity @ 25°C	----	1	µS/cm	13		----		12		----		14			
EA014 Total Soluble Salts															
Total Soluble Salts	----	5	mg/kg	43		----		40		----		44			
EA037: Ass Field Screening Analysis															
ø pH (F)	----	0.1	pH Unit	----		7.0		----		6.6		----			
ø pH (Fox)	----	0.1	pH Unit	----		5.5		----		4.9		----			
ø Reaction Rate	----	1	-	----		2		----		3		----			
EA055: Moisture Content															
Moisture Content (dried @ 103°C)	----	1	%	22.8		----		24.6		----		20.2			
EA150: Soil Classification based on Particle Size															
Clay (<2 µm)	----	1	%	27		----		26		----		24			
EA152: Soil Particle Density															
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	2.41		----		2.30		----		2.35			
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples															
Asbestos Detected	1332-21-4	0.1	g/kg	No		----		No		----		No			
Asbestos Type	1332-21-4	-	--	-		----		-		----		-			
Sample weight (dry)	----	0.01	g	460		----		508		----		410			
APPROVED IDENTIFIER:	----	-	--	G.MORGAN		----		G.MORGAN		----		G.MORGAN			
ED007: Exchangeable Cations															
Exchangeable Calcium	----	0.1	meq/100g	10.2		----		14.0		----		12.2			
Exchangeable Magnesium	----	0.1	meq/100g	4.2		----		4.9		----		4.8			
Exchangeable Potassium	----	0.1	meq/100g	0.3		----		0.4		----		0.2			
Exchangeable Sodium	----	0.1	meq/100g	<0.1		----		0.1		----		0.1			
Cation Exchange Capacity	----	0.1	meq/100g	14.7		----		19.5		----		17.4			
Exchangeable Aluminium	----	0.1	meq/100g	<0.1		----		<0.1		----		<0.1			
Exchangeable Sodium Percent	----	0.1	%	0.6		----		0.6		----		0.8			
Exchangeable Magnesium Percent	----	0.1	%	28.4		----		25.4		----		27.7			
Exchangeable Potassium Percent	----	0.1	%	1.9		----		2.1		----		1.4			
Exchangeable Calcium Percent	----	0.1	%	69.1		----		71.9		----		70.2			
Calcium/Magnesium Ratio	----	0.1	-	2.4		----		2.8		----		2.5			
Magnesium/Potassium Ratio	----	0.1	-	15.0		----		11.8		----		20.5			
ED045G: Chloride by Discrete Analyser															



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
					Result	Result	Result	Result	Result
ED045G: Chloride by Discrete Analyser - Continued									
Chloride	16887-00-6	10	mg/kg		<10	----	20	----	<10
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		<50	----	<50	----	<50
Iron	7439-89-6	0.005	%		3.83	----	4.56	----	3.95
Selenium	7782-49-2	5	mg/kg		<5	----	<5	----	<5
Arsenic	7440-38-2	5	mg/kg		<5	----	6	----	<5
Cadmium	7440-43-9	1	mg/kg		<1	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg		21	----	22	----	28
Copper	7440-50-8	5	mg/kg		55	----	46	----	29
Lead	7439-92-1	5	mg/kg		23	----	16	----	19
Nickel	7440-02-0	2	mg/kg		10	----	11	----	10
Zinc	7440-66-6	5	mg/kg		70	----	75	----	67
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP004: Organic Matter									
Organic Matter	----	0.5	%		4.8	----	5.7	----	5.9
Total Organic Carbon	----	0.5	%		2.8	----	3.3	----	3.4
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		<0.1	----	<0.1	----	<0.1
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	<0.05	----	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg		<0.05	----	<0.05	----	<0.05



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP074A: Monocyclic Aromatic Hydrocarbons								
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
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
Styrene	100-42-5	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
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	----	<5	----	<5
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	----	<5	----	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	----	<5	----	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	----	<5	----	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1,2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	----	<5	----	<5
Chloromethane	74-87-3	5	mg/kg		<5	----	<5	----	<5
Vinyl chloride	75-01-4	5	mg/kg		<5	----	<5	----	<5
Bromomethane	74-83-9	5	mg/kg		<5	----	<5	----	<5
Chloroethane	75-00-3	5	mg/kg		<5	----	<5	----	<5
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	----	<5	----	<5
1,1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Iodomethane	74-88-4	0.5	mg/kg		<0.5	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1-Dichloroethane	75-34-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dichloroethane	107-06-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Trichloroethene	79-01-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Dibromomethane	74-95-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,3-Dichloropropane	142-28-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Bromobenzene	108-86-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg	<0.5	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Bromoform	75-25-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	----	<1	----	<1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	<0.5	----	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	0.6	----	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	1.2	----	1.2
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg		<50	----	<50	----	<50
C15 - C28 Fraction	----	100	mg/kg		<100	----	<100	----	<100
C29 - C36 Fraction	----	100	mg/kg		<100	----	<100	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	<50	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	<10	----	<10

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	----	<50	
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	<100	
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	<100	
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	<50	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	<50	----	<50	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	----	<0.2	
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5	
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	----	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	120	----	111	----	125	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	107	----	105	----	118	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	102	----	96.9	----	103	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%	88.9	----	89.4	----	88.5	
Toluene-D8	2037-26-5	0.5	%	93.4	----	85.4	----	86.7	
4-Bromofluorobenzene	460-00-4	0.5	%	96.9	----	85.1	----	84.2	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	85.6	----	87.8	----	88.0	
2-Chlorophenol-D4	93951-73-6	0.5	%	82.5	----	86.1	----	85.0	
2,4,6-Tribromophenol	118-79-6	0.5	%	75.6	----	76.7	----	78.8	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	85.1	----	88.8	----	89.4	
Anthracene-d10	1719-06-8	0.5	%	81.6	----	84.1	----	85.4	
4-Terphenyl-d14	1718-51-0	0.5	%	89.5	----	94.0	----	97.3	
EP080S: TPH(V)/BTEX Surrogates									



Analytical Results

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

Client sample ID

				CHA103_0.1	CHA103_0.6	CHA104_0.1	CHA104_0.3	CHA105_0.1
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-006	EW1702296-007	EW1702296-008	EW1702296-009	EW1702296-010
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	88.8	----	90.3	----	89.6
Toluene-D8	2037-26-5	0.2	%	87.1	----	103	----	104
4-Bromofluorobenzene	460-00-4	0.2	%	80.8	----	98.4	----	96.6

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016	
				Result	Result	Result	Result	Result	
EA001: pH in soil using 0.01M CaCl extract									
pH (CaCl2)	----	0.1	pH Unit	----	5.9	----	----	----	
EA010: Conductivity									
Electrical Conductivity @ 25°C	----	1	µS/cm	----	25	----	13	----	
EA014 Total Soluble Salts									
Total Soluble Salts	----	5	mg/kg	----	81	----	43	----	
EA037: Ass Field Screening Analysis									
ø pH (F)	----	0.1	pH Unit	6.6	----	6.8	----	----	
ø pH (Fox)	----	0.1	pH Unit	5.9	----	5.5	----	----	
ø Reaction Rate	----	1	-	2	----	2	----	----	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%	----	20.5	----	24.3	2.3	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	----	25	----	----	----	
EA152: Soil Particle Density									
ø Soil Particle Density (Clay/Silt/Sand)	----	0.01	g/cm3	----	2.35	----	----	----	
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples									
Asbestos Detected	1332-21-4	0.1	g/kg	----	No	----	----	----	
Asbestos Type	1332-21-4	-	--	----	-	----	----	----	
Sample weight (dry)	----	0.01	g	----	403	----	----	----	
APPROVED IDENTIFIER:	----	-	--	----	G.MORGAN	----	----	----	
ED007: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	12.4	----	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	----	7.6	----	----	----	
Exchangeable Potassium	----	0.1	meq/100g	----	0.2	----	----	----	
Exchangeable Sodium	----	0.1	meq/100g	----	0.4	----	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	----	20.5	----	----	----	
Exchangeable Aluminium	----	0.1	meq/100g	----	<0.1	----	----	----	
Exchangeable Sodium Percent	----	0.1	%	----	1.7	----	----	----	
Exchangeable Magnesium Percent	----	0.1	%	----	37.1	----	----	----	
Exchangeable Potassium Percent	----	0.1	%	----	0.8	----	----	----	
Exchangeable Calcium Percent	----	0.1	%	----	60.3	----	----	----	
Calcium/Magnesium Ratio	----	0.1	-	----	1.6	----	----	----	
Magnesium/Potassium Ratio	----	0.1	-	----	43.1	----	----	----	
ED045G: Chloride by Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
					Result	Result	Result	Result	Result
ED045G: Chloride by Discrete Analyser - Continued									
Chloride	16887-00-6	10	mg/kg		----	20	----	20	----
EG005T: Total Metals by ICP-AES									
Boron	7440-42-8	50	mg/kg		----	<50	----	<50	----
Iron	7439-89-6	0.005	%		----	3.99	----	----	----
Selenium	7782-49-2	5	mg/kg		----	<5	----	<5	----
Arsenic	7440-38-2	5	mg/kg		----	<5	----	7	----
Cadmium	7440-43-9	1	mg/kg		----	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg		----	29	----	24	----
Copper	7440-50-8	5	mg/kg		----	24	----	48	----
Lead	7439-92-1	5	mg/kg		----	14	----	18	----
Nickel	7440-02-0	2	mg/kg		----	10	----	12	----
Zinc	7440-66-6	5	mg/kg		----	51	----	81	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	<0.1	----	<0.1	----
EP004: Organic Matter									
Organic Matter	----	0.5	%		----	5.5	----	----	----
Total Organic Carbon	----	0.5	%		----	3.2	----	----	----
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls	----	0.1	mg/kg		----	<0.1	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg		----	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg		----	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg		----	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg		----	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	<0.05	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg		----	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg		----	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg		----	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg		----	<0.05	----	<0.05	----
4,4'-DDE	72-55-9	0.05	mg/kg		----	<0.05	----	<0.05	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	<0.05	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	----	<0.05	----
EP074A: Monocyclic Aromatic Hydrocarbons								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
					Result	Result	Result	Result	Result
EP074A: Monocyclic Aromatic Hydrocarbons - Continued									
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	----
Styrene	100-42-5	0.5	mg/kg		----	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg		----	<0.5	----	<0.5	----
Isopropylbenzene	98-82-8	0.5	mg/kg		----	<0.5	----	<0.5	----
n-Propylbenzene	103-65-1	0.5	mg/kg		----	<0.5	----	<0.5	----
1,3,5-Trimethylbenzene	108-67-8	0.5	mg/kg		----	<0.5	----	<0.5	----
sec-Butylbenzene	135-98-8	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2,4-Trimethylbenzene	95-63-6	0.5	mg/kg		----	<0.5	----	<0.5	----
tert-Butylbenzene	98-06-6	0.5	mg/kg		----	<0.5	----	<0.5	----
p-Isopropyltoluene	99-87-6	0.5	mg/kg		----	<0.5	----	<0.5	----
n-Butylbenzene	104-51-8	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		----	<5	----	<5	----
2-Butanone (MEK)	78-93-3	5	mg/kg		----	<5	----	<5	----
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		----	<5	----	<5	----
2-Hexanone (MBK)	591-78-6	5	mg/kg		----	<5	----	<5	----
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074D: Fumigants									
2,2-Dichloropropane	594-20-7	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2-Dichloropropane	78-87-5	0.5	mg/kg		----	<0.5	----	<0.5	----
cis-1,3-Dichloropropylene	10061-01-5	0.5	mg/kg		----	<0.5	----	<0.5	----
trans-1,3-Dichloropropylene	10061-02-6	0.5	mg/kg		----	<0.5	----	<0.5	----
1,2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		----	<5	----	<5	----
Chloromethane	74-87-3	5	mg/kg		----	<5	----	<5	----
Vinyl chloride	75-01-4	5	mg/kg		----	<5	----	<5	----
Bromomethane	74-83-9	5	mg/kg		----	<5	----	<5	----
Chloroethane	75-00-3	5	mg/kg		----	<5	----	<5	----
Trichlorofluoromethane	75-69-4	5	mg/kg		----	<5	----	<5	----
1,1-Dichloroethene	75-35-4	0.5	mg/kg		----	<0.5	----	<0.5	----
Iodomethane	74-88-4	0.5	mg/kg		----	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
				Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued								
trans-1,2-Dichloroethene	156-60-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1-Dichloroethane	75-34-3	0.5	mg/kg	----	<0.5	----	<0.5	----
cis-1,2-Dichloroethene	156-59-2	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1,1-Trichloroethane	71-55-6	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1-Dichloropropylene	563-58-6	0.5	mg/kg	----	<0.5	----	<0.5	----
Carbon Tetrachloride	56-23-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dichloroethane	107-06-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Trichloroethene	79-01-6	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibromomethane	74-95-3	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1,2-Trichloroethane	79-00-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,3-Dichloropropane	142-28-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Tetrachloroethene	127-18-4	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1,1,2-Tetrachloroethane	630-20-6	0.5	mg/kg	----	<0.5	----	<0.5	----
trans-1,4-Dichloro-2-butene	110-57-6	0.5	mg/kg	----	<0.5	----	<0.5	----
cis-1,4-Dichloro-2-butene	1476-11-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,1,2,2-Tetrachloroethane	79-34-5	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2,3-Trichloropropane	96-18-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Pentachloroethane	76-01-7	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Hexachlorobutadiene	87-68-3	0.5	mg/kg	----	<0.5	----	<0.5	----
EP074F: Halogenated Aromatic Compounds								
Chlorobenzene	108-90-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Bromobenzene	108-86-1	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Chlorotoluene	95-49-8	0.5	mg/kg	----	<0.5	----	<0.5	----
4-Chlorotoluene	106-43-4	0.5	mg/kg	----	<0.5	----	<0.5	----
1,3-Dichlorobenzene	541-73-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1,4-Dichlorobenzene	106-46-7	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2-Dichlorobenzene	95-50-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2,4-Trichlorobenzene	120-82-1	0.5	mg/kg	----	<0.5	----	<0.5	----
1,2,3-Trichlorobenzene	87-61-6	0.5	mg/kg	----	<0.5	----	<0.5	----
EP074G: Trihalomethanes								
Chloroform	67-66-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Bromodichloromethane	75-27-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibromochloromethane	124-48-1	0.5	mg/kg	----	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit		EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
					Result	Result	Result	Result	Result
EP074G: Trihalomethanes - Continued									
Bromoform	75-25-2	0.5	mg/kg		----	<0.5	----	<0.5	----
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		----	<1	----	<1	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		----	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		----	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		----	<0.5	----	<0.5	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5	----	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5	----	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		----	<0.5	----	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		----	<0.5	----	<0.5	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		----	0.6	----	0.6	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		----	1.2	----	1.2	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		----	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg		----	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg		----	<100	----	<100	----
C29 - C36 Fraction	----	100	mg/kg		----	<100	----	<100	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		----	<50	----	<50	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		----	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		----	<10	----	<10	----

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	
Compound	CAS Number	LOR	Unit	EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016	
				Result	Result	Result	Result	Result	
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - 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	----	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	----	<50	----	
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	<0.5	<0.5	
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	----	<0.2	<0.2	
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	----	<0.5	<0.5	
Naphthalene	91-20-3	1	mg/kg	----	<1	----	<1	<1	
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%	----	119	----	121	----	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%	----	107	----	112	----	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%	----	94.9	----	99.9	----	
EP074S: VOC Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.5	%	----	88.0	----	92.3	----	
Toluene-D8	2037-26-5	0.5	%	----	87.3	----	87.7	----	
4-Bromofluorobenzene	460-00-4	0.5	%	----	85.6	----	84.9	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	----	84.4	----	80.5	----	
2-Chlorophenol-D4	93951-73-6	0.5	%	----	80.3	----	76.2	----	
2,4,6-Tribromophenol	118-79-6	0.5	%	----	76.7	----	75.7	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	----	85.4	----	82.3	----	
Anthracene-d10	1719-06-8	0.5	%	----	84.1	----	81.3	----	
4-Terphenyl-d14	1718-51-0	0.5	%	----	93.2	----	91.1	----	
EP080S: TPH(V)/BTEX Surrogates									



Analytical Results

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

Client sample ID

				CHA105_0.4	CHA106_0.1	CHA106_0.6	QC101	BLANK
Client sampling date / time				22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00	22-May-2017 00:00
Compound	CAS Number	LOR	Unit	EW1702296-011	EW1702296-012	EW1702296-013	EW1702296-014	EW1702296-016
				Result	Result	Result	Result	Result
EP080S: TPH(V)/BTEX Surrogates - Continued								
1,2-Dichloroethane-D4	17060-07-0	0.2	%	----	88.5	----	92.9	102
Toluene-D8	2037-26-5	0.2	%	----	105	----	105	99.5
4-Bromofluorobenzene	460-00-4	0.2	%	----	98.6	----	97.4	92.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SPIKE	TSC	----	----	----
Client sampling date / time					22-May-2017 00:00	22-May-2017 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EW1702296-017	EW1702296-018	-----	-----	-----
					Result	Result	----	----	----
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1	%		6.8	7.3	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		55	67	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		65	79	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		33	41	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		0.4	0.4	----	----	----
Toluene	108-88-3	0.5	mg/kg		14.4	17.2	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		2.0	2.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		10.4	12.3	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		4.4	5.3	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		31.6	37.7	----	----	----
^ Total Xylenes	1330-20-7	0.5	mg/kg		14.8	17.6	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		102	105	----	----	----
Toluene-D8	2037-26-5	0.2	%		93.6	100	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		85.8	92.7	----	----	----



Analytical Results

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

Client sample ID

				QC301	----	----	----	----
Client sampling date / time				22-May-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EW1702296-015	-----	-----	-----	-----
				Result	----	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	----	----	----	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1	µg/L	<1.0	----	----	----	----
Benzo(a)anthracene	56-55-3	1	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QC301	----	----	----	----
Client sampling date / time					22-May-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EW1702296-015	-----	-----	-----	-----
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1	%		23.4	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1	%		47.9	----	----	----	----
2,4,6-Tribromophenol	118-79-6	1	%		40.1	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1	%		59.0	----	----	----	----
Anthracene-d10	1719-06-8	1	%		87.7	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%		73.8	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		103	----	----	----	----
Toluene-D8	2037-26-5	2	%		93.4	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		93.8	----	----	----	----



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	CHA101_0.1 - 22-May-2017 00:00	Mid brown clay soil.
EA200: Description	CHA102_0.1 - 22-May-2017 00:00	Mid brown sandy soil.
EA200: Description	CHA103_0.1 - 22-May-2017 00:00	Mid brown sandy soil.
EA200: Description	CHA104_0.1 - 22-May-2017 00:00	Mid brown clay soil.
EA200: Description	CHA105_0.1 - 22-May-2017 00:00	Mid brown sandy soil.
EA200: Description	CHA106_0.1 - 22-May-2017 00:00	Mid brown sandy soil.



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP074S: VOC Surrogates			
1,2-Dichloroethane-D4	17060-07-0	64	130
Toluene-D8	2037-26-5	66	136
4-Bromofluorobenzene	460-00-4	60	122
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2,4,6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Certificate of Analysis

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Mitch Blencowe

Report 546937-S
Project name SOIL ANALYSIS
Project ID 8201714201
Received Date May 19, 2017

Client Sample ID			QC200
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My20695
Date Sampled			May 17, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	108
Volatile Organics			
1.1-Dichloroethane	0.5	mg/kg	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5

Client Sample ID			QC200
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My20695
Date Sampled			May 17, 2017
Test/Reference	LOR	Unit	
Volatile Organics			
Benzene	0.1	mg/kg	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5
Bromoform	0.5	mg/kg	< 0.5
Bromomethane	0.5	mg/kg	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5
Chloroethane	0.5	mg/kg	< 0.5
Chloroform	0.5	mg/kg	< 0.5
Chloromethane	0.5	mg/kg	< 0.5
cis-1,2-Dichloroethene	0.5	mg/kg	< 0.5
cis-1,3-Dichloropropene	0.5	mg/kg	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1
Iodomethane	0.5	mg/kg	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5
o-Xylene	0.1	mg/kg	< 0.1
Styrene	0.5	mg/kg	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5
Toluene	0.1	mg/kg	< 0.1
trans-1,2-Dichloroethene	0.5	mg/kg	< 0.5
trans-1,3-Dichloropropene	0.5	mg/kg	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5
Xylenes - Total	0.3	mg/kg	< 0.3
Fluorobenzene (surr.)	1	%	114
4-Bromofluorobenzene (surr.)	1	%	108
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5

Client Sample ID			QC200
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My20695
Date Sampled			May 17, 2017
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	82
p-Terphenyl-d14 (surr.)	1	%	68
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05
α-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
β-BHC	0.05	mg/kg	< 0.05
δ-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
γ-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	1	mg/kg	< 1
Dibutylchloroendate (surr.)	1	%	136
Tetrachloro-m-xylene (surr.)	1	%	107
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2

Client Sample ID			QC200
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My20695
Date Sampled			May 17, 2017
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	86
Polychlorinated Biphenyls			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5
Total PCB*	0.5	mg/kg	< 0.5
Dibutylchloroendate (surr.)	1	%	136
Tetrachloro-m-xylene (surr.)	1	%	107
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	4.6
Boron	10	mg/kg	< 10
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	27
Copper	5	mg/kg	24
Lead	5	mg/kg	14
Mercury	0.1	mg/kg	0.2
Nickel	5	mg/kg	8.7
Selenium	2	mg/kg	4.6
Zinc	5	mg/kg	55

Client Sample ID			QC200
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My20695
Date Sampled			May 17, 2017
Test/Reference	LOR	Unit	
% Moisture	1	%	17

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	May 24, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 24, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 24, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 24, 2017	14 Day
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	May 24, 2017	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2140 PAH and Phenols in Soils by GCMS	Sydney	May 24, 2017	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	May 24, 2017	14 Day
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS	Sydney	May 24, 2017	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	May 24, 2017	28 Days
Metals M8 - Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS	Sydney	May 24, 2017	28 Day
Heavy Metals - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Sydney	May 24, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	May 19, 2017	14 Day

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065
Project Name: SOIL ANALYSIS
Project ID: 8201714201

Order No.:
Report #: 546937
Phone: 02 9496 7822
Fax: 02 9499 3902

Received: May 19, 2017 1:17 PM
Due: May 26, 2017
Priority: 5 Day
Contact Name: Mitch Blencowe

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Boron	Selenium	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 18217																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	QC200	May 17, 2017		Soil	S17-My20695	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples 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. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 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, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1,2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1,3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	104			70-130	Pass	
TRH C10-C14	%	105			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
o-Xylene	%	110			70-130	Pass	
Xylenes - Total	%	110			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	100			70-130	Pass	
1.1.1-Trichloroethane	%	115			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	91			70-130	Pass	
1.1.2-Trichloroethane	%	104			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	89			70-130	Pass	
1.2-Dibromoethane	%	99			70-130	Pass	
1.2-Dichlorobenzene	%	109			70-130	Pass	
1.2-Dichloroethane	%	108			70-130	Pass	
1.2-Dichloropropane	%	104			70-130	Pass	
1.2.3-Trichloropropane	%	100			70-130	Pass	
1.2.4-Trimethylbenzene	%	106			70-130	Pass	
1.3-Dichlorobenzene	%	109			70-130	Pass	
1.3-Dichloropropane	%	102			70-130	Pass	
1.3.5-Trimethylbenzene	%	103			70-130	Pass	
1.4-Dichlorobenzene	%	108			70-130	Pass	
2-Butanone (MEK)	%	106			70-130	Pass	
2-Propanone (Acetone)	%	74			70-130	Pass	
4-Chlorotoluene	%	106			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	119			70-130	Pass	
Bromobenzene	%	105			70-130	Pass	
Bromochloromethane	%	74			70-130	Pass	
Bromodichloromethane	%	95			70-130	Pass	
Bromoform	%	73			70-130	Pass	
Bromomethane	%	81			70-130	Pass	
Carbon Tetrachloride	%	105			70-130	Pass	
Chlorobenzene	%	95			70-130	Pass	
Chloroethane	%	101			70-130	Pass	
Chloroform	%	118			70-130	Pass	
Chloromethane	%	126			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
cis-1.2-Dichloroethene	%	99			70-130	Pass	
cis-1.3-Dichloropropene	%	94			70-130	Pass	
Dibromochloromethane	%	88			70-130	Pass	
Dibromomethane	%	100			70-130	Pass	
Dichlorodifluoromethane	%	119			70-130	Pass	
Isopropyl benzene (Cumene)	%	89			70-130	Pass	
Styrene	%	96			70-130	Pass	
Tetrachloroethene	%	101			70-130	Pass	
trans-1.2-Dichloroethene	%	95			70-130	Pass	
trans-1.3-Dichloropropene	%	94			70-130	Pass	
Trichloroethene	%	104			70-130	Pass	
Vinyl chloride	%	111			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	114			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	102			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	100			70-130	Pass	
Benz(a)anthracene	%	97			70-130	Pass	
Benzo(a)pyrene	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	%	95			70-130	Pass	
Benzo(g,h,i)perylene	%	104			70-130	Pass	
Benzo(k)fluoranthene	%	121			70-130	Pass	
Chrysene	%	118			70-130	Pass	
Dibenz(a,h)anthracene	%	105			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	104			70-130	Pass	
Naphthalene	%	110			70-130	Pass	
Phenanthrene	%	95			70-130	Pass	
Pyrene	%	106			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	117			70-130	Pass	
4.4'-DDD	%	125			70-130	Pass	
4.4'-DDE	%	104			70-130	Pass	
4.4'-DDT	%	76			70-130	Pass	
α-BHC	%	112			70-130	Pass	
Aldrin	%	112			70-130	Pass	
β-BHC	%	113			70-130	Pass	
δ-BHC	%	125			70-130	Pass	
Dieldrin	%	118			70-130	Pass	
Endosulfan I	%	112			70-130	Pass	
Endosulfan II	%	116			70-130	Pass	
Endosulfan sulphate	%	118			70-130	Pass	
Endrin	%	110			70-130	Pass	
Endrin aldehyde	%	101			70-130	Pass	
Endrin ketone	%	98			70-130	Pass	
γ-BHC (Lindane)	%	100			70-130	Pass	
Heptachlor	%	101			70-130	Pass	
Heptachlor epoxide	%	73			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Hexachlorobenzene			%	110			70-130	Pass	
Methoxychlor			%	91			70-130	Pass	
Toxaphene			%	118			70-130	Pass	
LCS - % Recovery									
Organophosphorus Pesticides									
Dimethoate		%	82				70-130	Pass	
Ethion		%	78				70-130	Pass	
Fenitrothion		%	76				70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls									
Aroclor-1260		%	72				70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
TRH >C10-C16		%	116				70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic		%	96				70-130	Pass	
Boron		%	99				70-130	Pass	
Cadmium		%	100				70-130	Pass	
Chromium		%	90				70-130	Pass	
Copper		%	97				70-130	Pass	
Lead		%	113				70-130	Pass	
Mercury		%	117				70-130	Pass	
Nickel		%	92				70-130	Pass	
Selenium		%	88				70-130	Pass	
Zinc		%	95				70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-My20695	CP	%	90			70-130	Pass	
TRH C10-C14	S17-My20449	NCP	%	103			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-My20695	CP	%	89			70-130	Pass	
Toluene	S17-My20695	CP	%	86			70-130	Pass	
Ethylbenzene	S17-My20695	CP	%	85			70-130	Pass	
m&p-Xylenes	S17-My20695	CP	%	85			70-130	Pass	
o-Xylene	S17-My20695	CP	%	82			70-130	Pass	
Xylenes - Total	S17-My20695	CP	%	84			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethane	S17-My25639	NCP	%	101			70-130	Pass	
1.1.1-Trichloroethane	S17-My25639	NCP	%	113			70-130	Pass	
1.1.1.2-Tetrachloroethane	S17-My25639	NCP	%	91			70-130	Pass	
1.1.2-Trichloroethane	S17-My25639	NCP	%	85			70-130	Pass	
1.1.2.2-Tetrachloroethane	S17-My25639	NCP	%	91			70-130	Pass	
1.2-Dibromoethane	S17-My25639	NCP	%	79			70-130	Pass	
1.2-Dichlorobenzene	S17-My25639	NCP	%	96			70-130	Pass	
1.2-Dichloroethane	S17-My25639	NCP	%	88			70-130	Pass	
1.2-Dichloropropane	S17-My25639	NCP	%	85			70-130	Pass	
1.2.3-Trichloropropane	S17-My25639	NCP	%	94			70-130	Pass	
1.2.4-Trimethylbenzene	S17-My25639	NCP	%	92			70-130	Pass	
1.3-Dichlorobenzene	S17-My25639	NCP	%	95			70-130	Pass	
1.3-Dichloropropane	S17-My25639	NCP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3.5-Trimethylbenzene	S17-My25639	NCP	%	90			70-130	Pass	
1.4-Dichlorobenzene	S17-My25639	NCP	%	95			70-130	Pass	
2-Butanone (MEK)	S17-My25639	NCP	%	110			70-130	Pass	
2-Propanone (Acetone)	S17-My25639	NCP	%	73			70-130	Pass	
4-Chlorotoluene	S17-My25639	NCP	%	92			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My25639	NCP	%	96			70-130	Pass	
Bromobenzene	S17-My25639	NCP	%	95			70-130	Pass	
Bromochloromethane	S17-My25639	NCP	%	114			70-130	Pass	
Bromodichloromethane	S17-My25639	NCP	%	79			70-130	Pass	
Bromoform	S17-My25639	NCP	%	73			70-130	Pass	
Bromomethane	S17-My25639	NCP	%	79			70-130	Pass	
Carbon Tetrachloride	S17-My25639	NCP	%	102			70-130	Pass	
Chlorobenzene	S17-My25639	NCP	%	93			70-130	Pass	
Chloroethane	S17-My25639	NCP	%	91			70-130	Pass	
Chloroform	S17-My25639	NCP	%	117			70-130	Pass	
Chloromethane	S17-My25639	NCP	%	109			70-130	Pass	
cis-1.2-Dichloroethene	S17-My25639	NCP	%	97			70-130	Pass	
cis-1.3-Dichloropropene	S17-My25639	NCP	%	75			70-130	Pass	
Dibromochloromethane	S17-My25639	NCP	%	70			70-130	Pass	
Dibromomethane	S17-My25639	NCP	%	82			70-130	Pass	
Dichlorodifluoromethane	S17-My25639	NCP	%	82			70-130	Pass	
Isopropyl benzene (Cumene)	S17-My25639	NCP	%	85			70-130	Pass	
Styrene	S17-My25639	NCP	%	91			70-130	Pass	
Tetrachloroethene	S17-My25639	NCP	%	77			70-130	Pass	
trans-1.2-Dichloroethene	S17-My25639	NCP	%	88			70-130	Pass	
trans-1.3-Dichloropropene	S17-My25639	NCP	%	76			70-130	Pass	
Trichloroethene	S17-My25639	NCP	%	84			70-130	Pass	
Vinyl chloride	S17-My25639	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My20695	CP	%	73			70-130	Pass	
TRH C6-C10	S17-My20695	CP	%	89			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-My16883	NCP	%	98			70-130	Pass	
Acenaphthylene	S17-My16883	NCP	%	95			70-130	Pass	
Anthracene	S17-My16883	NCP	%	96			70-130	Pass	
Benz(a)anthracene	S17-My16883	NCP	%	71			70-130	Pass	
Benzo(a)pyrene	S17-My19245	NCP	%	117			70-130	Pass	
Benzo(b&j)fluoranthene	S17-My19245	NCP	%	96			70-130	Pass	
Benzo(g,h,i)perylene	S17-My19245	NCP	%	119			70-130	Pass	
Benzo(k)fluoranthene	S17-My19245	NCP	%	123			70-130	Pass	
Chrysene	S17-My16883	NCP	%	74			70-130	Pass	
Dibenz(a,h)anthracene	S17-My16883	NCP	%	96			70-130	Pass	
Fluoranthene	S17-My19245	NCP	%	109			70-130	Pass	
Fluorene	S17-My16883	NCP	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-My16883	NCP	%	77			70-130	Pass	
Naphthalene	S17-My16883	NCP	%	105			70-130	Pass	
Phenanthrene	S17-My16883	NCP	%	87			70-130	Pass	
Pyrene	S17-My19245	NCP	%	106			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S17-My25629	NCP	%	113			70-130	Pass	
4.4'-DDD	S17-My25629	NCP	%	129			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4.4'-DDE	S17-My25629	NCP	%	103			70-130	Pass	
4.4'-DDT	S17-My25629	NCP	%	91			70-130	Pass	
a-BHC	S17-My25629	NCP	%	108			70-130	Pass	
Aldrin	S17-My25629	NCP	%	108			70-130	Pass	
b-BHC	S17-My25629	NCP	%	102			70-130	Pass	
d-BHC	S17-My25629	NCP	%	115			70-130	Pass	
Dieldrin	S17-My25629	NCP	%	115			70-130	Pass	
Endosulfan I	S17-My25629	NCP	%	109			70-130	Pass	
Endosulfan II	S17-My25629	NCP	%	114			70-130	Pass	
Endosulfan sulphate	S17-My25629	NCP	%	111			70-130	Pass	
Endrin	S17-My25629	NCP	%	112			70-130	Pass	
Endrin aldehyde	S17-My25629	NCP	%	93			70-130	Pass	
Endrin ketone	S17-My25629	NCP	%	105			70-130	Pass	
g-BHC (Lindane)	S17-My25629	NCP	%	96			70-130	Pass	
Heptachlor	S17-My25629	NCP	%	101			70-130	Pass	
Heptachlor epoxide	S17-My25629	NCP	%	116			70-130	Pass	
Hexachlorobenzene	S17-My10443	NCP	%	116			70-130	Pass	
Methoxychlor	S17-My25629	NCP	%	99			70-130	Pass	
Toxaphene	S17-My22692	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S17-My25649	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-My20449	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S17-My17038	NCP	%	94			70-130	Pass	
Boron	S17-My17038	NCP	%	109			70-130	Pass	
Cadmium	S17-My17038	NCP	%	95			70-130	Pass	
Chromium	S17-My17038	NCP	%	90			70-130	Pass	
Copper	S17-My17038	NCP	%	97			70-130	Pass	
Lead	S17-My17038	NCP	%	108			70-130	Pass	
Mercury	S17-My17038	NCP	%	111			70-130	Pass	
Nickel	S17-My17038	NCP	%	92			70-130	Pass	
Selenium	S17-My17038	NCP	%	85			70-130	Pass	
Zinc	S17-My17038	NCP	%	94			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My25638	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S17-My20448	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S17-My20448	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S17-My20448	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-My25638	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-My25638	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-My25638	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-My25638	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-My25638	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-My25638	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate								
Volatile Organics				Result 1	Result 2	RPD		
1.1-Dichloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.1-Dichloroethene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.1.1-Trichloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.1.1.2-Tetrachloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.1.2-Trichloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.1.2.2-Tetrachloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2-Dibromoethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2-Dichlorobenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2-Dichloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2-Dichloropropane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2.3-Trichloropropane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.2.4-Trimethylbenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.3-Dichlorobenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.3-Dichloropropane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.3.5-Trimethylbenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.4-Dichlorobenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2-Butanone (MEK)	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2-Propanone (Acetone)	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
4-Chlorotoluene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
4-Methyl-2-pentanone (MIBK)	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Allyl chloride	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromobenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromochloromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromodichloromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromoform	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Bromomethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Carbon disulfide	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Carbon Tetrachloride	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chlorobenzene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloroethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloroform	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chloromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1.2-Dichloroethene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
cis-1.3-Dichloropropene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromochloromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibromomethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dichlorodifluoromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Iodomethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Isopropyl benzene (Cumene)	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Methylene Chloride	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Styrene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Tetrachloroethene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1.2-Dichloroethene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1.3-Dichloropropene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichloroethene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichlorofluoromethane	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Vinyl chloride	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S17-My25638	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S17-My25638	NCP	mg/kg	< 20	< 20	<1	30%	Pass

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S17-My16882	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S17-My20695	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
α-BHC	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
β-BHC	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
δ-BHC	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
γ-BHC (Lindane)	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S17-My20695	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S17-My20695	CP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	S17-My20695	CP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass

Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Ethion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethyl parathion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfthion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	S17-My20695	CP	mg/kg	< 2	< 2	<1	30%	Pass
Naled	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Omethoate	S17-My20695	CP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tetrachlorvinphos	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	S17-My20695	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S17-My20695	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S17-My20695	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Total PCB*	S17-My22691	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S17-My20448	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S17-My20448	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S17-My20448	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S17-My22934	NCP	mg/kg	14	16	10	30%	Pass
Boron	S17-My22934	NCP	mg/kg	11	10	13	30%	Pass
Cadmium	S17-My22934	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S17-My22934	NCP	mg/kg	34	34	2.0	30%	Pass
Copper	S17-My22934	NCP	mg/kg	38	38	2.0	30%	Pass
Lead	S17-My22934	NCP	mg/kg	1700	2000	15	30%	Pass
Mercury	S17-My22934	NCP	mg/kg	0.1	0.1	10	30%	Pass
Nickel	S17-My22934	NCP	mg/kg	32	35	8.0	30%	Pass
Selenium	S17-My22934	NCP	mg/kg	4.4	4.2	5.0	30%	Pass
Zinc	S17-My22934	NCP	mg/kg	570	550	4.0	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S17-My15916	NCP	%	17	17	1.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Company Name:	Cardno (NSW/ACT) Pty Ltd	Order No.:		Received:	May 19, 2017 1:17 PM
Address:	Level 9, 203 Pacific Highway	Report #:	546937	Due:	May 26, 2017
	St Leonards	Phone:	02 9496 7822	Priority:	5 Day
	NSW 2065	Fax:	02 9499 3902	Contact Name:	Mitch Blencowe
Project Name:	SOIL ANALYSIS				
Project ID:	8201714201				
Eurofins mgt Analytical Services Manager : Nibha Vaidya					

Sample Detail						Total Recoverable Hydrocarbons
Moisture Set						
Volatile Organics						
BTEX						
Metals M8						
Polychlorinated Biphenyls						
Organophosphorus Pesticides						
Organochlorine Pesticides						
Polycyclic Aromatic Hydrocarbons						
Selenium						
Boron						
Melbourne Laboratory - NATA Site # 1254 & 14271						
Sydney Laboratory - NATA Site # 18217						X
Brisbane Laboratory - NATA Site # 20794						
Perth Laboratory - NATA Site # 18217						
External Laboratory						
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID	
1	QC200	May 17, 2017		Soil	S17-My20695	X
Test Counts						1

Sample Receipt Advice

Company name: **Cardno (NSW/ACT) Pty Ltd**

Contact name: **Mitch Blencowe**

Project name: **SOIL ANALYSIS**

Project ID: **8201714201**

COC number: **Not provided**

Turn around time: **5 Day**

Date/Time received: **May 19, 2017 1:17 PM**

Eurofins | mgt reference: **546937**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Mitch Blencowe - mitch.blencowe@cardno.com.au.

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: * Asbestos to be tested from 2 block / ASS to be tested from second ziplock bag
* pH clay content etc. to be tested from 10- / contaminants to be tested from 10- container.

[illegible]

V = VOA VM KCl Preserved VB = VOA VM Sodium Bisphosphate Preserved VS = VOA VM Saline Preserved AV = Airfree Unpreserved Vial SQ = Saline Preserved Artery Glass, H = HCl preserved Plastic, HS = HCl preserved Plastic, SP = Saline Preserved Plastic, F = Formaldehyde Preserved Glass,

286915

COC NSW

From: Helen Simpson <helen.simpson@alsglobal.com>
Sent: Monday, 22 May 2017 11:10 AM
To: COC NSW
Subject: RE: Cardno Split Sample

Hi Ursula,

Our S-16 suite is for TRH/BTEX/PAH/OC/OP/PCB and 8 metals

Kind regards,

Helen Simpson
Sample Admin, Environmental
Sydney



T +61 2 8784 8555 **D** +61 2 8784 8535
F +61 2 8784 8500
helen.simpson@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164

We are keen for your feedback! Please click here for your 1 question survey

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EnviroMail™ 105 – Anionic Surfactants as MBAS vs MBAS screens, plus new method Quality Improvements and Miniaturisation

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From: COCNSW@Eurofins.com [<mailto:COCNSW@Eurofins.com>]
Sent: Friday, 19 May 2017 7:53 PM
To: Helen Simpson <helen.simpson@alsglobal.com>
Subject: Cardno Split Sample

Hi there I have attached a COC we received with a sample.
Could you please confirm what analysis is in "S-16"?
Regards,
Ursula Long

ALS Group: Click [here](#) to report this email as spam.

The information contained in this email is confidential. If the reader is not the intended recipient then you

Certificate of Analysis

Cardno (NSW/ACT) Pty Ltd
Level 9, 203 Pacific Highway
St Leonards
NSW 2065



NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Attention: Mitch Blencowe

Report 547473-S
Project name 8201714201-001-600
Project ID 8201714201-001-600
Received Date May 24, 2017

Client Sample ID			QC201
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My24408
Date Sampled			May 22, 2017
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	118
Volatile Organics			
1.1-Dichloroethane	0.5	mg/kg	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5

Client Sample ID			QC201
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My24408
Date Sampled			May 22, 2017
Test/Reference	LOR	Unit	
Volatile Organics			
Benzene	0.1	mg/kg	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5
Bromoform	0.5	mg/kg	< 0.5
Bromomethane	0.5	mg/kg	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5
Chloroethane	0.5	mg/kg	< 0.5
Chloroform	0.5	mg/kg	< 0.5
Chloromethane	0.5	mg/kg	< 0.5
cis-1,2-Dichloroethene	0.5	mg/kg	< 0.5
cis-1,3-Dichloropropene	0.5	mg/kg	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1
Iodomethane	0.5	mg/kg	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5
o-Xylene	0.1	mg/kg	< 0.1
Styrene	0.5	mg/kg	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5
Toluene	0.1	mg/kg	< 0.1
trans-1,2-Dichloroethene	0.5	mg/kg	< 0.5
trans-1,3-Dichloropropene	0.5	mg/kg	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5
Xylenes - Total	0.3	mg/kg	< 0.3
Fluorobenzene (surr.)	1	%	95
4-Bromofluorobenzene (surr.)	1	%	118
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5

Client Sample ID			QC201
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My24408
Date Sampled			May 22, 2017
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90
p-Terphenyl-d14 (surr.)	1	%	72
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4,4'-DDD	0.05	mg/kg	< 0.05
4,4'-DDE	0.05	mg/kg	< 0.05
4,4'-DDT	0.05	mg/kg	< 0.05
α-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
β-BHC	0.05	mg/kg	< 0.05
δ-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
γ-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	1	mg/kg	< 1
Dibutylchloroendate (surr.)	1	%	97
Tetrachloro-m-xylene (surr.)	1	%	103
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2

Client Sample ID			QC201
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My24408
Date Sampled			May 22, 2017
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	85
Polychlorinated Biphenyls			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5
Total PCB*	0.5	mg/kg	< 0.5
Dibutylchlorendate (surr.)	1	%	97
Tetrachloro-m-xylene (surr.)	1	%	103
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	5.7
Boron	10	mg/kg	< 10
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	20
Copper	5	mg/kg	40
Lead	5	mg/kg	17
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	9.5
Selenium	2	mg/kg	< 2
Zinc	5	mg/kg	64

Client Sample ID			QC201
Sample Matrix			Soil
Eurofins mgt Sample No.			S17-My24408
Date Sampled			May 22, 2017
Test/Reference	LOR	Unit	
% Moisture	1	%	24

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: TRH C6-C36 - LTM-ORG-2010	Sydney	May 26, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 26, 2017	14 Day
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 26, 2017	14 Day
BTEX - Method: TRH C6-C40 - LTM-ORG-2010	Sydney	May 26, 2017	14 Day
Volatile Organics - Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices	Sydney	May 26, 2017	7 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2140 PAH and Phenols in Soils by GCMS	Sydney	May 26, 2017	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	May 31, 2017	14 Day
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS	Sydney	May 26, 2017	14 Day
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water	Sydney	May 31, 2017	28 Days
Metals M8 - Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS	Sydney	May 26, 2017	28 Day
Heavy Metals - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Sydney	May 26, 2017	180 Day
% Moisture - Method: LTM-GEN-7080 Moisture	Sydney	May 24, 2017	14 Day

Company Name: Cardno (NSW/ACT) Pty Ltd
Address: Level 9, 203 Pacific Highway
St Leonards
NSW 2065
Project Name: 8201714201-001-600
Project ID: 8201714201-001-600

Order No.:
Report #: 547473
Phone: 02 9496 7822
Fax: 02 9499 3902

Received: May 24, 2017 4:20 PM
Due: May 31, 2017
Priority: 5 Day
Contact Name: Mitch Blencowe

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Boron	Selenium	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organophosphorus Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271																
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																
Perth Laboratory - NATA Site # 18217																
External Laboratory																
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID											
1	QC201	May 22, 2017		Soil	S17-My24408	X	X	X	X	X	X	X	X	X	X	X
Test Counts						1	1	1	1	1	1	1	1	1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples 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. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 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, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1,2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1,3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.05			0.05	Pass	
α-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
β-BHC	mg/kg	< 0.05			0.05	Pass	
δ-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
γ-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Selenium	mg/kg	< 2			2	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	120			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	97			70-130	Pass	
Toluene	%	95			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
o-Xylene	%	94			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	120			70-130	Pass	
1.1-Dichloroethene	%	119			70-130	Pass	
1.1.1-Trichloroethane	%	119			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	113			70-130	Pass	
1.1.2-Trichloroethane	%	114			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	109			70-130	Pass	
1.2-Dibromoethane	%	115			70-130	Pass	
1.2-Dichlorobenzene	%	121			70-130	Pass	
1.2-Dichloroethane	%	116			70-130	Pass	
1.2-Dichloropropane	%	115			70-130	Pass	
1.2.3-Trichloropropane	%	114			70-130	Pass	
1.2.4-Trimethylbenzene	%	124			70-130	Pass	
1.3-Dichlorobenzene	%	125			70-130	Pass	
1.3-Dichloropropane	%	115			70-130	Pass	
1.3.5-Trimethylbenzene	%	124			70-130	Pass	
1.4-Dichlorobenzene	%	124			70-130	Pass	
2-Butanone (MEK)	%	100			70-130	Pass	
2-Propanone (Acetone)	%	103			70-130	Pass	
4-Chlorotoluene	%	121			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	114			70-130	Pass	
Allyl chloride	%	113			70-130	Pass	
Bromobenzene	%	119			70-130	Pass	
Bromochloromethane	%	103			70-130	Pass	
Bromodichloromethane	%	113			70-130	Pass	
Bromoform	%	110			70-130	Pass	
Bromomethane	%	91			70-130	Pass	
Carbon disulfide	%	121			70-130	Pass	
Carbon Tetrachloride	%	116			70-130	Pass	
Chlorobenzene	%	117			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloroethane	%	100			70-130	Pass	
Chloroform	%	115			70-130	Pass	
Chloromethane	%	122			70-130	Pass	
cis-1.2-Dichloroethene	%	116			70-130	Pass	
cis-1.3-Dichloropropene	%	117			70-130	Pass	
Dibromochloromethane	%	116			70-130	Pass	
Dibromomethane	%	113			70-130	Pass	
Dichlorodifluoromethane	%	111			70-130	Pass	
Iodomethane	%	107			70-130	Pass	
Isopropyl benzene (Cumene)	%	117			70-130	Pass	
Methylene Chloride	%	102			70-130	Pass	
Styrene	%	118			70-130	Pass	
Tetrachloroethene	%	122			70-130	Pass	
trans-1.2-Dichloroethene	%	121			70-130	Pass	
trans-1.3-Dichloropropene	%	119			70-130	Pass	
Trichloroethene	%	121			70-130	Pass	
Trichlorofluoromethane	%	116			70-130	Pass	
Vinyl chloride	%	112			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	79			70-130	Pass	
Acenaphthylene	%	81			70-130	Pass	
Anthracene	%	84			70-130	Pass	
Benz(a)anthracene	%	80			70-130	Pass	
Benzo(a)pyrene	%	85			70-130	Pass	
Benzo(b&j)fluoranthene	%	83			70-130	Pass	
Benzo(g,h,i)perylene	%	70			70-130	Pass	
Benzo(k)fluoranthene	%	92			70-130	Pass	
Chrysene	%	90			70-130	Pass	
Dibenz(a,h)anthracene	%	72			70-130	Pass	
Fluoranthene	%	83			70-130	Pass	
Fluorene	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
Phenanthrene	%	82			70-130	Pass	
Pyrene	%	83			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	90			70-130	Pass	
4.4'-DDD	%	106			70-130	Pass	
4.4'-DDE	%	97			70-130	Pass	
4.4'-DDT	%	114			70-130	Pass	
a-BHC	%	96			70-130	Pass	
Aldrin	%	87			70-130	Pass	
b-BHC	%	84			70-130	Pass	
d-BHC	%	100			70-130	Pass	
Dieldrin	%	94			70-130	Pass	
Endosulfan I	%	91			70-130	Pass	
Endosulfan II	%	97			70-130	Pass	
Endosulfan sulphate	%	99			70-130	Pass	

Test				Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin				%	86			70-130	Pass	
Endrin aldehyde				%	91			70-130	Pass	
Endrin ketone				%	73			70-130	Pass	
g-BHC (Lindane)				%	78			70-130	Pass	
Heptachlor				%	70			70-130	Pass	
Heptachlor epoxide				%	100			70-130	Pass	
Hexachlorobenzene				%	104			70-130	Pass	
Methoxychlor				%	114			70-130	Pass	
Toxaphene				%	99			70-130	Pass	
LCS - % Recovery										
Organophosphorus Pesticides										
Ethion		%		110				70-130	Pass	
Fenitrothion		%		87				70-130	Pass	
LCS - % Recovery										
Polychlorinated Biphenyls										
Aroclor-1260		%		93				70-130	Pass	
LCS - % Recovery										
Total Recoverable Hydrocarbons - 2013 NEPM Fractions										
TRH >C10-C16		%		123				70-130	Pass	
LCS - % Recovery										
Heavy Metals										
Arsenic		%		96				70-130	Pass	
Boron		%		79				70-130	Pass	
Cadmium		%		99				70-130	Pass	
Chromium		%		92				70-130	Pass	
Copper		%		96				70-130	Pass	
Lead		%		98				70-130	Pass	
Mercury		%		99				70-130	Pass	
Nickel		%		92				70-130	Pass	
Selenium		%		90				70-130	Pass	
Zinc		%		90				70-130	Pass	
Test		Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery										
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					Result 1					
TRH C6-C9		S17-My24239	NCP	%	71			70-130	Pass	
TRH C10-C14		S17-My24316	NCP	%	111			70-130	Pass	
Spike - % Recovery										
BTEX					Result 1					
Benzene		S17-My27249	NCP	%	127			70-130	Pass	
Toluene		S17-My27249	NCP	%	129			70-130	Pass	
Ethylbenzene		S17-My27249	NCP	%	130			70-130	Pass	
m&p-Xylenes		S17-My27249	NCP	%	122			70-130	Pass	
o-Xylene		S17-My27249	NCP	%	124			70-130	Pass	
Xylenes - Total		S17-My27249	NCP	%	123			70-130	Pass	
Spike - % Recovery										
Volatile Organics					Result 1					
1.1-Dichloroethane		S17-My27249	NCP	%	122			70-130	Pass	
1.1-Dichloroethene		S17-My27249	NCP	%	112			70-130	Pass	
1.1.1-Trichloroethane		S17-My27249	NCP	%	124			70-130	Pass	
1.1.1.2-Tetrachloroethane		S17-My27249	NCP	%	120			70-130	Pass	
1.1.2-Trichloroethane		S17-My27249	NCP	%	126			70-130	Pass	
1.1.2.2-Tetrachloroethane		S17-My27249	NCP	%	139			70-130	Fail	Q08
1.2-Dibromoethane		S17-My27249	NCP	%	123			70-130	Pass	
1.2-Dichlorobenzene		S17-Mv27249	NCP	%	125			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichloroethane	S17-My27249	NCP	%	123			70-130	Pass	
1.2-Dichloropropane	S17-My27249	NCP	%	123			70-130	Pass	
1.2.3-Trichloropropane	S17-My27249	NCP	%	124			70-130	Pass	
1.2.4-Trimethylbenzene	S17-My27249	NCP	%	107			70-130	Pass	
1.3-Dichlorobenzene	S17-My27249	NCP	%	122			70-130	Pass	
1.3-Dichloropropane	S17-My27249	NCP	%	122			70-130	Pass	
1.3.5-Trimethylbenzene	S17-My24189	NCP	%	116			70-130	Pass	
1.4-Dichlorobenzene	S17-My27249	NCP	%	124			70-130	Pass	
2-Butanone (MEK)	S17-My27249	NCP	%	105			70-130	Pass	
2-Propanone (Acetone)	S17-My24189	NCP	%	122			70-130	Pass	
4-Chlorotoluene	S17-My27249	NCP	%	124			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My24189	NCP	%	120			70-130	Pass	
Allyl chloride	S17-My27249	NCP	%	119			70-130	Pass	
Bromobenzene	S17-My27249	NCP	%	120			70-130	Pass	
Bromochloromethane	S17-My27249	NCP	%	120			70-130	Pass	
Bromodichloromethane	S17-My27249	NCP	%	125			70-130	Pass	
Bromoform	S17-My27249	NCP	%	115			70-130	Pass	
Bromomethane	S17-My27249	NCP	%	103			70-130	Pass	
Carbon disulfide	S17-My27249	NCP	%	108			70-130	Pass	
Carbon Tetrachloride	S17-My27249	NCP	%	123			70-130	Pass	
Chlorobenzene	S17-My27249	NCP	%	115			70-130	Pass	
Chloroethane	S17-My27249	NCP	%	104			70-130	Pass	
Chloroform	S17-My27249	NCP	%	126			70-130	Pass	
Chloromethane	S17-My27249	NCP	%	107			70-130	Pass	
cis-1.2-Dichloroethene	S17-My27249	NCP	%	126			70-130	Pass	
cis-1.3-Dichloropropene	S17-My27249	NCP	%	125			70-130	Pass	
Dibromochloromethane	S17-My27249	NCP	%	122			70-130	Pass	
Dibromomethane	S17-My27249	NCP	%	121			70-130	Pass	
Dichlorodifluoromethane	S17-My27249	NCP	%	101			70-130	Pass	
Iodomethane	S17-My27249	NCP	%	117			70-130	Pass	
Isopropyl benzene (Cumene)	S17-My27249	NCP	%	123			70-130	Pass	
Methylene Chloride	S17-My27249	NCP	%	105			70-130	Pass	
Styrene	S17-My27249	NCP	%	124			70-130	Pass	
Tetrachloroethene	S17-My27249	NCP	%	127			70-130	Pass	
trans-1.2-Dichloroethene	S17-My27249	NCP	%	121			70-130	Pass	
trans-1.3-Dichloropropene	S17-My27249	NCP	%	123			70-130	Pass	
Trichloroethene	S17-My27249	NCP	%	124			70-130	Pass	
Trichlorofluoromethane	S17-My27249	NCP	%	105			70-130	Pass	
Vinyl chloride	S17-My27249	NCP	%	120			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My27249	NCP	%	124			70-130	Pass	
TRH C6-C10	S17-My24239	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-My27152	NCP	%	102			70-130	Pass	
Acenaphthylene	S17-My27152	NCP	%	105			70-130	Pass	
Anthracene	S17-My27152	NCP	%	107			70-130	Pass	
Benz(a)anthracene	S17-My27152	NCP	%	107			70-130	Pass	
Benzo(a)pyrene	S17-My27152	NCP	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	S17-My27152	NCP	%	102			70-130	Pass	
Benzo(g,h,i)perylene	S17-My27152	NCP	%	94			70-130	Pass	
Benzo(k)fluoranthene	S17-My27152	NCP	%	121			70-130	Pass	
Chrysene	S17-My27152	NCP	%	114			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibenz(a,h)anthracene	S17-My27152	NCP	%	90			70-130	Pass	
Fluoranthene	S17-My27152	NCP	%	109			70-130	Pass	
Fluorene	S17-My27152	NCP	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-My27152	NCP	%	100			70-130	Pass	
Naphthalene	S17-My27152	NCP	%	106			70-130	Pass	
Phenanthrene	S17-My27152	NCP	%	104			70-130	Pass	
Pyrene	S17-My27152	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S17-My24239	NCP	%	101			70-130	Pass	
4.4'-DDD	S17-My29145	NCP	%	122			70-130	Pass	
4.4'-DDE	S17-My24239	NCP	%	106			70-130	Pass	
4.4'-DDT	S17-My29145	NCP	%	75			70-130	Pass	
a-BHC	S17-My24239	NCP	%	111			70-130	Pass	
Aldrin	S17-My24239	NCP	%	89			70-130	Pass	
b-BHC	S17-My24239	NCP	%	103			70-130	Pass	
d-BHC	S17-My24239	NCP	%	116			70-130	Pass	
Dieldrin	S17-My24239	NCP	%	109			70-130	Pass	
Endosulfan I	S17-My24239	NCP	%	100			70-130	Pass	
Endosulfan II	S17-My24239	NCP	%	115			70-130	Pass	
Endosulfan sulphate	S17-My24239	NCP	%	113			70-130	Pass	
Endrin	S17-My24239	NCP	%	109			70-130	Pass	
Endrin aldehyde	S17-My24239	NCP	%	98			70-130	Pass	
Endrin ketone	S17-My24239	NCP	%	86			70-130	Pass	
g-BHC (Lindane)	S17-My24239	NCP	%	85			70-130	Pass	
Heptachlor	S17-My24239	NCP	%	77			70-130	Pass	
Heptachlor epoxide	S17-My24239	NCP	%	108			70-130	Pass	
Methoxychlor	S17-My29145	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Ethion	S17-My26695	NCP	%	101			70-130	Pass	
Fenitrothion	S17-My26695	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S17-My26695	NCP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-My24316	NCP	%	116			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S17-My25778	NCP	%	89			70-130	Pass	
Boron	S17-My27152	NCP	%	75			70-130	Pass	
Cadmium	S17-My25778	NCP	%	97			70-130	Pass	
Chromium	S17-My25778	NCP	%	71			70-130	Pass	
Copper	S17-My25778	NCP	%	77			70-130	Pass	
Lead	S17-My23443	NCP	%	98			70-130	Pass	
Mercury	S17-My25778	NCP	%	105			70-130	Pass	
Nickel	S17-My25778	NCP	%	80			70-130	Pass	
Selenium	S17-My25778	NCP	%	82			70-130	Pass	
Zinc	S17-My25985	NCP	%	113			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My27248	NCP	mg/kg	39	64	48	30%	Fail	Q15
TRH C10-C14	S17-My27151	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S17-My27151	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S17-My27151	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-My27248	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-My27248	NCP	mg/kg	0.4	0.4	82	30%	Fail	Q15
Ethylbenzene	S17-My27248	NCP	mg/kg	1.9	1.9	61	30%	Fail	Q02
m&p-Xylenes	S17-My27248	NCP	mg/kg	7.4	7.4	55	30%	Fail	Q02
o-Xylene	S17-My27248	NCP	mg/kg	1.6	1.6	62	30%	Fail	Q02
Xylenes - Total	S17-My27248	NCP	mg/kg	9.1	9.1	56	30%	Fail	Q02
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S17-My27248	NCP	mg/kg	8.4	8.4	40	30%	Fail	Q15
1.3-Dichlorobenzene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S17-My27248	NCP	mg/kg	2.6	2.6	42	30%	Fail	Q15
1.4-Dichlorobenzene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Volatile Organics				Result 1	Result 2	RPD		
Isopropyl benzene (Cumene)	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Methylene Chloride	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Styrene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Tetrachloroethene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1,2-Dichloroethene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
trans-1,3-Dichloropropene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichloroethene	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Trichlorofluoromethane	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Vinyl chloride	S17-My27248	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S17-My27248	NCP	mg/kg	3.7	3.7	16	30%	Pass
TRH C6-C10	S17-My27248	NCP	mg/kg	67	96	35	30%	Fail
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S17-My27151	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	S17-My24236	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
4,4'-DDD	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-BHC	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S17-My24236	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S17-My24236	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Toxaphene	S17-My24236	NCP	mg/kg	< 1	< 1	<1	30%	Pass

Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	S17-My26694	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethyl parathion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfthion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	S17-My26694	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Naled	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Omethoate	S17-My26694	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tetrachlorvinphos	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	S17-My26694	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1221	S17-My24236	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S17-My24236	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S17-My27151	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S17-My27151	NCP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S17-My27151	NCP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Arsenic	S17-My23194	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	S17-My24408	CP	mg/kg	< 10	< 10	<1	30%	Pass
Cadmium	S17-My23189	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S17-My23194	NCP	mg/kg	< 5	5.0	7.0	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Copper	S17-My23194	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	S17-My23194	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Mercury	S17-My23194	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Nickel	S17-My23194	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Selenium	S17-My24408	CP	mg/kg	< 2	< 2	<1	30%	Pass
Zinc	S17-My23194	NCP	mg/kg	< 5	< 5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
% Moisture	S17-My16882	NCP	%	16	17	2.0	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)



Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please [click here](#).

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Company Name:	Cardno (NSW/ACT) Pty Ltd	Order No.:		Received:	May 24, 2017 4:20 PM
Address:	Level 9, 203 Pacific Highway	Report #:	547473	Due:	May 31, 2017
	St Leonards	Phone:	02 9496 7822	Priority:	5 Day
	NSW 2065	Fax:	02 9499 3902	Contact Name:	Mitch Blencowe
Project Name:	8201714201-001-600				
Project ID:	8201714201-001-600				
Eurofins mgt Analytical Services Manager : Nibha Vaidya					

[illegible]

Sample Receipt Advice

Company name: **Cardno (NSW/ACT) Pty Ltd**
Contact name: **MITCH BLENCOWE**
Project name: **8201714201-001-600**
Project ID: **8201714201-001-600**
COC number: **Not provided**
Turn around time: **5 Day**
Date/Time received: **May 24, 2017 4:20 PM**
Eurofins | mgt reference: **547473**

Sample information

- ☒ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☒ All samples have been received as described on the above COC.
- ☒ COC has been completed correctly.
- ☒ Attempt to chill was evident.
- ☒ Appropriately preserved sample containers have been used.
- ☒ All samples were received in good condition.
- ☒ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☒ Appropriate sample containers have been used.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to MITCH BLENCOWE - mitch.blencowe@cardno.com.au.

CHAIN OF CUSTODY

Environmental Division
Wollongong
Work Order Reference
EW1702296



Telephone : 02 42253125

APPENDIX

G

DATA QUALITY OBJECTIVES AND QA/QC EVALUATION

Tallawarra Concept
Approval Modification



E-1 Data Quality Objectives

The NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd Edition)*, which is endorsed by the NSW EPA under s105 of the *Contaminated Land Management Act 1997*, requires that Data Quality Objectives (DQOs) are to be adopted for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) *Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations*.

The DQOs for the site investigation, as detailed within NSW EPA (2006), are summarised in **Table E-1**.

Table E-1: Data Quality Objectives

DQO Step	Discussion
Step 1: State the Problem	The investigation areas form two portions of the proposed Tallawarra Lands development, the Central and Northern Precinct. To determine the potential risks before, during and after construction of the development, a soil investigation is required.
Step 2: Identify the decision / goal of the study	- Are there CoPC concentrations detectable in the soil associated with current and historic activities at the site? - Is there any existing data and is this data valid? - What are the standard laboratory limits of reporting (LOR) for CoPC in the sample media being assessed? - Are there any CoPC impacts within the boundaries of the investigation above laboratory limits of reporting (LOR) for the CoPCs? - Has the extent of the CoPC impacts to soil been identified and determined? - Is the investigation approach scientifically suitable and defensible? The decision statement is as follows: Based on the data available, identify whether further assessment, risk assessment or other management measures are required.
Step 3: Identify the information inputs	- Site history - Previous analytical data. - Results of analysis undertaken as part of this assessment. - Visual observations of the site and soil being sampled.
Step 4: Define the boundaries of the study	The boundaries of the study are: - Lateral - the sampling of soil and groundwater is limited to the lateral extent of the Site as illustrated in the figures provided in Appendix A. - Vertical – the sampling of soil is limited to up to 2 m bgl. - Temporal - the temporal boundary is the current sampling between May and July 2017.
Step 5: Develop the analytical approach	The investigation program is detailed in Section 4, with the decision rules: - If the laboratory quality assurance/ quality control data are within the acceptable ranges, the data will be considered suitable for use. - If the CoPCs are reported above the laboratory detection limit in one or more samples, then calculation and review of the following will be used to screen the potential risk: 95% upper confidence limit (UCL) of the arithmetic average for that sample type, then compared against the adopted criteria. - the standard deviation of the data is less than 50% of the adopted criteria. - the maximum concentration is less than 250% of the adopted criteria - If the CoPC are reported below the laboratory detection limit in all samples, then it will be considered that there is no evidence of a potential complete source-pathway-receptor linkage and that further assessment or risk assessment is not required. The decision on the acceptance of the analytical data will be made on the basis of the Data Quality Indicators (DQI) which are included in Table E-2, below.
Step 6: Specify performance or acceptance criteria	In accordance with the relevant guidelines as endorsed under the <i>Contaminated Land Management Act 1997</i>, specific limits for this project are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate indicators of data quality, and standard procedures for field sampling and handling. This step also examines the certainty of conclusive statements based on the available new site data collected and includes the following points to quantify tolerable limits:

DQO Step	Discussion
	1. A decision can be made based on a certainty assumption of 95% confidence in any given data set. A limit on the decision error will be 5% that a conclusive statement may be a false positive or false negative. A decision error in the context of the decision rule presented above would lead to either underestimation or overestimation of the risk level associated with a particular sampling area. Decision errors may include: 1. Sampling errors may occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site. To address this: a. The sampling plan outlined minimum numbers of samples proposed to be collected from each media, as summarised in Section 3.2. As such, there may be limitations in the data if aspects of the sampling plan cannot be implemented. Some examples of this scenario include but are not limited to: i) Restrictions in borehole depth due to drilling refusal. ii) Proposed samples are not collected due to access being restricted to a given location. 2. Limitations in ability to acquire useful and representative information from the data collected. The data are proposed to be collected from multiple locations and sample media. Some examples of this scenario include but are not limited to: a. Soil samples not being obtained from groundwater wells or at the depth where groundwater is encountered. 3. Measurement errors can occur during sample collection, handling, preparation, analysis and data reduction. To address this the following measures are proposed: b. Field staff to follow a standard procedure when undertaking samples, including decontamination of tools, removal of adhered soil to avoid false positives in results, collection of representative samples and use of appropriate sample containers and preservation methods. c. Laboratories to follow a standard procedure when preparing samples for analysis and undertaking analysis. d. Laboratories to report quality assurance/ quality control data for comparison with the DQIs established for the project
Step 7: Develop the plan for obtaining data.	The work plan is designed to meet the project objectives in Section 1.2 and the DQOs outlined above. The work plan will be optimised based on the ground conditions encountered during the field program.

E-2 Data Quality Indicators

The following Data Quality Indicators (DQIs), referenced in Step 6 in **Table E-1**, have been adopted in accordance with the NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd Edition)*. The DQIs outlined in **Table E-2** assist with decisions regarding the contamination status of the site, including the quality of the laboratory data obtained.

Table E-2: Data Quality Indicators

Data Quality Indicator	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	All samples
Soil bore and test pit logs complete and correct	All samples	All samples
Suitably qualified and experience sampler	All samples	All samples
Appropriate lab methods and limits of reporting (LORs)	All samples	All samples
Chain of custodies (COCs) completed appropriately	All samples	All samples
Sample holding times complied with	All samples	All samples

Proposed/critical locations sampled	-	Proposed/critical locations sampled
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Climatic conditions (temp, rain etc) recorded and influence on samples quantified (if required)	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	All Samples
Samples homogenous	All samples	All Samples
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts detected and assessed
Samples extracted and analysed within holding times	All samples	-
Precision		
Blind duplicates (intra-laboratory duplicates)	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Split duplicates (inter-laboratory duplicates)	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit RPD Result <10 × LOR
Accuracy (Bias)		
Trip blanks	1 per sampling event	COPCs<LOR
Trip spikes	1 per sampling event	70-130%
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%
Method blanks	1 per 20 samples	<LOR

E-3 Quality Control / Quality Assurance

Quality Assurance/Quality Control (QA/QC) procedures were implemented to ensure the precision accuracy, representativeness, completeness and comparability of all data gathered. The QA/QC procedures included:

- Equipment calibration to ensure field measurements obtained are accurate;
- Equipment decontamination to prevent cross contamination;
- The completion of a log for each soil bore;
- Use of appropriate measures (i.e. gloves) to prevent cross contamination;

- Collection and analysis of duplicate samples for QA/QC purposes;
- Correct sample preservation;
- Sample transport with Chain of Custody (COC) documentation; and
- Laboratory analysis in accordance with NATA accredited methods.

Table E-3 details the QA/QC procedures and sample collection details undertaken through the soil elements of the investigation. **Table E-4** summarises the number of QA/QC samples collected during this investigation. Copies of all the COCs, along with the Sample Receipt Notifications (SRNs), Interpretive QA/QC Reports are provided in **Appendix J**.

Table E-3: Field QA/QC Method Validation

Requirement	Yes/No	Comments
Equipment calibration	Yes	Calibration certificates are presented in Appendix C .
Equipment decontamination	Yes	Sampling was completed using a gloved hand that were disposed of following collection of each sample. Decontamination of equipment was therefore not required.
Soil logging	Yes	All soil bores, test pits and soil samples were logged in accordance with the Unified Soil Classification System. Geological logs are provided in Appendix B .
Sample collection	Yes	Samples were collected using disposable nitrile gloves and placed directly into Teflon lined sample jars provided by the laboratory. A clean pair of gloves was used for each new sample being collected to limit the possibility of cross-contamination.
Sample identification	Yes	All samples were marked with a unique identifier including project number, sample location, depth and date.
QA/QC sample collection	Yes	Two soil duplicate samples were collected for intra-lab QA/QC purposes with a further two triplicate soil samples collected to monitor the quality of the field practices for sample collection. Cardno based the investigation around a rate of one duplicate sample per 20 primary samples or one per day, as the requirement for duplicate sample collection.
Sample preservation	Yes	Samples were placed in a chilled esky filled with ice for storage and transport to the laboratory.
COC documentation	Yes	A COC form was completed by Cardno detailing sample identification, collection date, sampler and laboratory analysis required. The COC form was signed off and returned to Cardno by the laboratory staff upon receipt of all the samples. COC forms and Sample Receipt Notification (SRN) are provided in Appendix C . The SRN indicates that the samples were received at the laboratory intact and chilled and within the required holding times.
NATA accredited methods	Yes	The NATA accredited ALS Laboratory analysed the samples in accordance with NATA accredited methods. Inter-lab QA/QC samples were analysed at Eurofins. Analytical methods used are indicated in the stamped laboratory results provided in Appendix D .

Table E-4: Field QA/QC Collection Summary

Investigation Element	Date	Sample Type and Number of Samples					
		Primary	Duplicate	Split (Triplicate)	Trip blank	Field blank	Trip spike
Soil	May and July 2017	34	2	2	3	-	3

E-4 Relative Percentage Difference Determination

Laboratory results for duplicate and triplicate samples are assessed using a determination of the Relative Percentage Difference (RPD). Where a primary sample and a duplicate sample are compared, the RPD provides an indication of the reproducibility of the results, which incorporates the sampling method. Where a

primary sample and a split sample are compared, the RPD provides an indication of the accuracy of the primary laboratory results as compared to the secondary laboratory result.

The calculation used to determine the RPD is:

$$RPD = \frac{(Co - Cs)}{\left(\frac{Co + Cs}{2}\right)} \times 100$$

Where:

Co = Concentration of the original sample

Cs = Concentration of the duplicate sample

In calculating the RPD values the following protocols were adopted:

- > Where both concentrations are above laboratory reporting limits the RPD formula is used;
- > Where both concentrations are below the laboratory reporting limits, no RPD is calculated; and
- > Where one or both sample concentrations are reported to be less than ten times (<10x) the laboratory reporting limit, the RPD is calculated but is not assessed against the adopted criterion.

In accordance with the Australian Standard 4482.1-2005 (Standards Australia, 2005), Cardno adopts an RPD acceptance criterion up to 50% of the mean concentration of the analyte. It should be noted that variations might be higher for organic analysis, due to the volatile nature of the components, and for low concentrations of analytes.

The adopted criterion will not apply to RPDs where one of both concentrations are less than 10 times the reporting limit, as this criterion would otherwise overestimate the significance of minor variations in concentrations at or near the laboratory reporting limit. Large RPDs returned for low concentrations of analytes near the reporting limit is not as indicative of a significant difference in the results as a small RPD is for larger concentrations.

This approach is employed by NATA accredited laboratories when assessing internal duplicate sample RPDs. This approach acknowledges that concentrations at or around the reporting limit are too low for an accurate evaluation of the significance of the RPD.

This approach has been adopted when assessing the relevance (compliance) of RPDs during this investigation. RPDs will be calculated for sample sets where one or both concentrations are less than 10 times the reporting limit for discussion purposes, but will not be assessed as a pass or fail in relation to the criterion.

A list of primary samples for the duplicate and triplicate soil samples is provided in **Table E-5** with a summary of the RPD results is presented in **Appendix E-5**.

Table E-5: Soil RPD Results

Primary	Duplicate	Triplicate
<i>Soils</i>		
CTP103_0.1	QC100	QC200
CHA104_0.1	QC101	QC201

E-5 Laboratory QC and QCI Report Summary

The laboratory selected for undertaking the analysis ([Insert Laboratory]) is NATA accredited for the analysis required, and undertook certain QA/QC requirements to demonstrate the suitability of the data that is obtained. The laboratory is required to undertake and report internal laboratory Quality Control (QC) procedures for all chemical analysis undertaken. The QC testing is required to include:

- > Laboratory duplicate sample analysis at the rate of one duplicate analysis per ten samples;
- > Method blank at the rate of one method blank analysis per 20 samples;

- > Laboratory control sample at the rate of one laboratory control sample analysis per 20 samples; and
- > Spike recovery analysis at the rate of one spike recovery analysis per 20 samples.

Compliance with the laboratory QA/QC requirements and non-conformance details are discussed in the internal Laboratory QA/QC reports included with the certificates of analysis in **Appendix D**.

The QA/QC Report received by ALS Laboratory (in **Appendix D**) highlights outliers flagged in the Quality Control Report and Holding Time breaches and breaches in the Frequency of Quality Control Samples. Review of the QA/QC documentation provided by ALS Laboratory, indicates that several outliers existed which are summarised in **Table E-6**.

Table E-6: Laboratory QA/QC outlier summary

	QC Sample ID	Analyte	Description
<i>Outliers: Quality Control Samples</i>			
Method Blanks	N/A	N/A	N/A
Duplicates	N/A	N/A	N/A
Laboratory Control Samples	N/A	N/A	N/A
Matrix Spikes	N/A	N/A	N/A
Regular Sample Surrogates	N/A	N/A	N/A
<i>Outliers: Analysis Holding Time Compliance</i>			
N/A			
<i>Frequency of Quality Control Samples</i>			
SOIL			
• Batch EW170277: two laboratory duplicate and two matrix spike frequencies were below the expected rate for this batch • Batch EW1702296: two laboratory duplicate and two matrix spike frequencies were below the expected rate for this batch • Batch ES1717236: four laboratory duplicate frequencies were below the expected rate for this batch			
<i>Field Duplicate / Triplicate RPD</i>			
The RPD calculations between parent/duplicate/triplicate indicate that unacceptable RPDs did not occur during the assessment.			
<i>Trip Blanks</i>			
All trip blanks reported contaminant concentrations below the LOR with the exception of Trip Blank_7/07/17, which reported a concentration of Chromium of 3 mg/kg. It is not known what caused the detection of chromium in the trip blank prepared on 7/07/17. The two plausible potential causes are cross contamination occurring during preparation of the blank sample by ALS or cross contamination during soil sampling and sample transportation. The maximum concentration of chromium reported during the assessment was relatively low with a concentration of 32 mg/kg in sample CTP101_0.1. The soil results indicate that the concentrations of chromium are not above adopted screening criteria and as such the detection of chromium in the trip blank sample is not considered significant and does not compromise the integrity of the data.			
<i>Trip Spikes</i>			
Each trip spike submitted for analysis during the assessment reported spike recoveries within the acceptable range.			

Cardno concludes that the data reported by the NATA accredited ALS Laboratory as presented in this assessment is suitable for interpretative purposes and to make conclusions/recommendations regarding site contamination.

