



16 December 2013

DSI - DETAILED SITE INVESTIGATION

Former Port Kembla Primary School, Military Road, Port Kembla, NSW



REPORT

Submitted to:

Port Kembla Copper Pty Ltd
Military Road
PORT KEMBLA, NSW 2505

Report Number. 137623028-003-R-Rev0

Distribution:

5 Copies - Port Kembla Copper Pty Ltd
1 Copy - Golder Associates Pty Ltd Associates





Executive Summary

Introduction

Golder Associates Pty Ltd (Golder) was engaged by Port Kembla Copper Pty Ltd (PKC) to complete a Detailed Site Investigation (DSI) at the former Port Kembla Primary School, located on Military Road, Port Kembla, New South Wales (the site). The objective of the DSI was to assess for the presence and extent of the soil and groundwater contamination resulting from historical activities which occurred at the site and surrounding properties. PKC wishes to support divest the site for potential future mixed business and medium density residential land use.

Scope of work

The scope of work completed as part of the DSI consisted of the following tasks:

- Collection of soil samples from 30 (grid based) locations on site and two locations off site. The purpose of the off-site sampling was to assess background soil quality and support development of site specific ecological assessment criteria for soil.
- Installation of four shallow monitoring wells and sampling groundwater from two existing deep monitoring wells installed on site.
- Analysis of the chemicals of interest for the site identified during a preceding Phase 1 environmental site assessment for the property (Golder, November 2012), which included a suite of organic and inorganic chemicals.

Results

Soil

- The investigation indicates the site is underlain by a generally thin layer of fill material, typically consisting of silty clay and sandy clay. Coal washery reject was reported to be present in approximately one-third of the locations, whilst asbestos was positively identified at seven locations, situated in the northern and central portions of the site.
- Natural soils typically comprising gravelly silty clay and clay underlie the fill, under which is volcanic bedrock generally encountered at approximately 1 mbgl.
- The concentrations of the chemicals of interest were not reported greater than the limits of reporting and/or health investigations levels adopted for the proposed mixed business and medium density residential land use. Nutrients reported at concentrations greater than the limit of reporting are considered to represent ambient background soil conditions.
- The concentrations of arsenic (3 samples), copper (22 samples) and zinc (7 samples) exceeded the adopted ecological investigation levels (EILs).
- The concentrations of total recoverable hydrocarbons (TRH) F3 ($>C_{16} - C_{34}$) in samples from test pits TP25 and TP28 located near to the Electrolytic Street were greater than the residential ecological screening levels (ESLs).
- Asbestos containing material was detected in samples collected from the test pits TP10, TP11, TP12A, TP15, TP16A, TP16B and TP20 – located in the central and northern portion of the site. Analysis indicated that one sample (TP10_0.0_0.1) had a concentration of non-friable asbestos above the investigation value for residential B (0.04%) and commercial/industrial D (0.05% w/w) land use scenarios.



- The presence of the chemicals of interest greater than the ecological assessment criteria, asbestos and general fill material may require future management in residential portions of the site (if redeveloped for this purpose), which could include on site retention (eg placement under road reserves/pavements) and management through the implementation of an environmental management plan (EMP).

Groundwater

- Shallow monitoring wells were installed near locations where water seepage was reported during soil investigations. However, groundwater did not accumulate in these wells and consequently were not sampled. This tends to suggest that any shallow groundwater under the site (including that observed by Golder (November 2012)) is likely to be perched, of limited extent, potentially ephemeral and will therefore have limited potential uses.
- Groundwater levels in two deep (fractured rock) monitoring wells installed at the site ranged from 0.450 (D4) to 1.70 (D1) m below top of casing (btoc). Inferred groundwater flow based on previous investigations is towards the north (URS, 2007). Since the site is located on a ridge and is likely to represent a recharge zone and groundwater divide, groundwater movement in other directions (including south towards Coomaditchy Lagoon) is also possible.
- The concentrations of the chemicals of interest were not reported greater than the limit of reporting or investigation levels, with the exception of:
 - Copper and zinc, which are greater than the adopted marine ecosystems criteria.
 - Chromium, copper, lead, nickel and zinc, which are greater than the adopted freshwater ecosystems criteria.

The concentrations of these chemicals of interest are likely to represent ambient background groundwater quality, given the industrial history of the region, the similarity in the concentrations of metals in soils on site and at background soil sample locations, and the location of the site in a recharge zone. On this basis, management of groundwater under the site is not considered to be required.



Table of Contents

1.0	INTRODUCTION.....	1
1.1	Background and Previous Investigations.....	1
1.2	Objectives.....	2
1.3	Scope of Work.....	2
1.3.1	Stage 1 - Test Pit and Off-site Hand Auger Soil Sampling.....	2
1.3.2	Stage 2 – Bore holes and Monitoring Well Installation.....	3
2.0	SITE DESCRIPTION.....	4
2.1	Site Location.....	4
2.2	Surrounding Land Use.....	4
2.3	Site History.....	4
2.4	Topography.....	5
2.5	Geology and Hydrogeology.....	5
2.6	Previous Site Investigations.....	6
2.6.1	Graeme Waller & Associates (August 1996), Environmental Lead Assessment, Port Kembla Public School.....	6
2.6.2	Port Kembla Copper (October 2000), Port Kembla Community Soil Monitoring Programme Post Establishment Soil Plot Report.....	6
2.6.3	Graham Brooks and Associates (February 2002), Heritage Assessment, Port Kembla Public School.....	6
2.6.4	Port Kembla Copper (July 2002), Internal Memorandum, Old Port Kembla Primary School Soil Assessment.....	7
2.6.5	Zweep & Connolly (2002), Valuation and Acquisition Report on Commercial Development Property at Military Road, Port Kembla, 2505.....	7
2.6.6	URS (February 2006), Soil and Groundwater Investigation, Port Kembla Copper Smelter Facility, Port Kembla, NSW.....	8
2.6.7	URS (November 2007), Groundwater Monitoring Port Kembla Copper, May 2007 Round.....	8
2.6.8	Golder (November 2012), Phase 1 Environmental Site Assessment – Former Port Kembla Primary School.....	8
2.7	Site Areas and Chemicals of Potential Concern.....	9
3.0	FIELD INVESTIGATIONS.....	10
3.2	Sampling Plan and Methodology.....	10
3.2.1	Soil Sampling.....	10



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

3.2.2	Groundwater Sampling	12
3.3	Analytical Program.....	13
3.3.1	Soil	13
3.3.2	Groundwater	14
4.0	ASSESSMENT CRITERIA.....	14
4.1	General.....	14
4.2	Soil Investigation Levels	15
4.2.1	Canadian Guideline for TPH fractions.....	15
4.2.2	Health Investigation Levels (HILs)	15
4.2.3	Asbestos Health Screening Levels	16
4.2.4	Ecological Based Guidelines.....	16
4.2.4.1	General.....	16
4.2.4.2	Ecological Screening Levels (ESLs)	16
4.2.4.3	Ecological Investigation Levels (EILs)	16
4.2.5	Management Limits.....	17
4.3	Summary	18
4.3.1	Proposed Soil Investigation Levels	19
4.4	Groundwater Investigation Levels.....	21
4.4.1	General	21
4.4.2	Human Health Based Assessment.....	21
4.4.3	Ecological Based Assessment Criteria.....	21
4.4.4	Proposed Groundwater Investigation Levels.....	21
5.0	INVESTIGATION RESULTS.....	23
5.1	Subsurface Observations	23
5.2	Field Screening.....	23
5.2.1	Field Screening for Volatile Organic Compounds	23
5.3	Soil Analytical Results	23
5.3.1	Adopted Health Investigation Levels.....	23
5.3.2	Adopted Ecological Investigation Levels	25
5.3.3	Adopted Management Investigation Levels	26
5.3.4	Adopted Asbestos Investigation Levels.....	26
5.4	Groundwater Investigation Results	26
5.4.1	Groundwater Conditions and Flow	26



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

5.4.2	Groundwater Chemical Analytical Results	27
6.0	QUALITY ASSURANCE AND QUALITY CONTROL.....	29
6.1	Quality Assurance (QA) Program	29
6.2	Quality Control (QC) Program	29
6.3	Quality of Analytical Data Results.....	30
6.4	Quality of Analytical Data Results.....	30
6.5	Data Validation Results	30
7.0	DISCUSSION AND CONCLUSIONS.....	32
8.0	LIMITATIONS AND USE OF THIS REPORT	34
9.0	REFERENCES.....	35

FIGURES

Figure 1 – Site Location

Figure 2 – Test Pit and Groundwater Monitoring Well Locations

Figure 3 – Locations with Asbestos Detected

TABLES

Table 1: Summary of Site Details.....	4
Table 2: Site Geological and Hydrogeological Information.....	5
Table 3: Areas and Chemicals of Potential Concern	9
Table 4: Soil Sampling Scope	10
Table 5: Groundwater Sampling Scope	12
Table 6: Monitoring Well Location Selection Rationale.	13
Table 7: Soil Analytical Program	14
Table 8: Groundwater Analysis Programme.....	14
Table 9: Ambient Background Concentrations (ABC)	17
Table 10: Soil Properties Used in ACL Calculation	17
Table 11: Proposed Soil Investigation Levels (in mg/kg).....	19
Table 12: Proposed Groundwater Investigation Levels (µg/L)	22
Table 13: Canadian Investigation Levels for Petroleum Hydrocarbons in Coarse Grained Soils	24



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

APPENDICES

APPENDIX A

Sampling & Analytical Quality Plan

APPENDIX B

Site Photographs

APPENDIX C

Test Pit and Bore hole Logs

APPENDIX D

Tables of Analytical Results

APPENDIX E

Laboratory Certificates of Analysis and Data Validation

APPENDIX F

Calibration Certificates

APPENDIX G

Limitations



1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) was engaged by Port Kembla Copper Pty Ltd (PKC) to complete a Detailed Site Investigation (DSI) of the former Port Kembla Primary School, located on Military Road, Port Kembla, New South Wales (the site). The site location is shown in **Figure 1** attached.

The objective of the DSI was to assess for the presence of the soil and groundwater contamination resulting from historical activities which occurred at the site and surrounding properties. The DSI was completed in accordance with our proposal (ref. P27623114_L_Rev0, dated 1 November 2012) and Golder Sampling, Analysis and Quality Plan, (SAQP), dated 20 June 2013, (attached as **Appendix A**).

Golder understands PKC is seeking to divest the property for potential mixed business and medium residential land use.

1.1 Background and Previous Investigations

The site is approximately 2.2 hectares in area and predominantly open space, with grass cover across the south eastern and north western ends. The central portion of the site (where the previous remaining former school building was located - now demolished) is paved with concrete. Bitumen basketball and netball courts are located immediately to the north, north-west and north east of the former main school building. Concrete foundations of various demolished school buildings are located in the south eastern and north eastern portions of the site.

Golder previously completed a Phase 1 Environmental Site Assessment (ESA) (Report 127623035-001-R-Rev0, November 2012) for the site. The results of this study indicated the following in relation to the site condition:

- The site is located adjacent to heavy industrial, commercial and residential land of Port Kembla.
- The site was used as a school from 1916 until 2002, when it was purchased by PKC and left as vacant land forming a buffer between the site and surrounding properties.
- All except one of the former school buildings were demolished by PKC (the main school building was heritage listed and was retained). The heritage building was damaged by fire in 2012 and subsequently demolished in 2013 (during the DSI).
- Asbestos cement sheeting was used in the former site buildings. Suspected asbestos cement fragments were present on the ground surface near the remaining building (identified prior to fire damage and subsequent demolition of this structure).
- Lead based paints and polychlorinated biphenyl (PCB) containing light fittings and switches may have been used in the site buildings – based on the known age of the property.
- Parts of the site appear to have been filled using slag and coal washery reject (CWR). The chemical nature and extent of the fill is not known.
- Previous investigations reported lead and copper in shallow soil (depths less than 1 m below ground level) at concentrations greater than the adopted investigation levels for residential and open space land uses.
- The site is reported to be habitat to Green and Golden Bell Frogs (*Litoria aurea*) a species listed as endangered.
- Selected heavy metals (copper, nickel and zinc) were detected at concentrations above the respective ANZECC/ARMCANZ (2000) marine 95% trigger levels in groundwater samples collected from two existing, on-site, groundwater monitoring wells (D1 and D4) which were installed in 2005 (URS, 2006). The well locations shown in the attached **Figure 2**

On the basis of the information gathered during this Phase 1 ESA, Golder concluded the following:

- Impacted soils previously reported at the site may be associated with the following historical activities:



- On-site – filling of land, use of asbestos containing materials (ACM) in site buildings and possible use of lead containing paint.
- Off-site – fallout from neighbouring industrial sites.
- The nature and extent of impacts have not been delineated, and
- An intrusive (soil and groundwater) assessment was required to:
 - Assess the nature and extent of impacts (if present) at the site.
 - Develop management/remedial measures (if required) to make the land suitable for its intended future land use.

1.2 Objectives

The objectives of the DSI included the following:

- Assess the nature and extent (if present) of contamination to soil and groundwater resulting from the potentially contaminating activities identified in the Phase 1 ESA.
- Assess the suitability of the site for potential future mixed business and medium density residential land use.
- Obtain sufficient information to develop remediation and/or management measures (if required) to render the site suitable for the proposed future uses.

1.3 Scope of Work

The DSI was completed in general accordance with the SAQP (**Appendix A**), which describes the approach and rationale applied to the works.

Fieldwork was completed in two stages (Stages 1 and 2) – the timing and scope of which are described in the following sections.

1.3.1 Stage 1 - Test Pit and Off-site Hand Auger Soil Sampling

- Excavation of 24 test pits (TP01 – TP16, TP20 and TP24 – TP30) using a small excavator on 25 – 27 June 2013;
- The test pits were located on an approximately 30 m x 30 m grid with the purpose being to broadly characterise shallow soils / fill under the unsealed areas of the site. Some of the locations also targeted potential point sources of contamination, including the periphery of building areas (where lead paint and asbestos containing materials may have been used) and a former septic tank.
- Soil samples were collected from each test pit at the following indicative depth intervals:
 - Surface to 0.25 mbgl (near surface sampling), 0.5 mbgl, 1 mbgl and at every metre thereafter (and/or where evidence of contamination was noted through field observations).
- Two background soil sample locations were collected using a hand auger on nearby vacant residential lots for the purpose of measuring Ambient Background Concentrations (ABC) for calculation of ecological investigation levels (EILs) in accordance with the National Environment Protection (Assessment of Site Contamination) Measure as amended 2013 (ASC NEPM); and
- Sampling locations were backfilled with the soil cuttings generated.



1.3.2 Stage 2 – Bore holes and Monitoring Well Installation

- Drilling of six bore holes (BH01 to BH06) on 9 and 10 October 2013 using a small drilling rig fitted with push tube augers.
- The boreholes were located on an approximate 30 m grid in the sealed areas of the site (at and surrounding the former main building) where test pitting was not possible.
- Four monitoring wells (MW1 – MW4) were installed.
- Soil cuttings from drilling activities were stored in secure, sealed and appropriately labelled buckets on-site for subsequent treatment and disposal by PKC;
- Groundwater monitoring well construction was carried out according to Golder protocols and Minimum Construction Requirements for Water Bores in Australia (ARMCANZ, 2003). Bore licences were registered with the Department of Primary Industries, Office of Water, in accordance with the *Water Management (General) Regulation 2011*;
- The monitoring wells were proposed to be developed one week after installation, but were dry. Accordingly, groundwater samples were not collected from the four new shallow wells. However, the two existing deep wells located on-site (D1 and D4) were sampled during July 2013.



2.0 SITE DESCRIPTION

Characteristics of the site are presented in the following sections based on information presented in the Phase 1 ESA (Golder, 2012) conducted for the site.

Photographs taken during the DSI are included in **Appendix B**.

2.1 Site Location

The location of the site is shown in **Figure 1**. **Table 1** presents a summary of the site identification details.

Table 1: Summary of Site Details

Site Name	Former Port Kembla Primary School
Street Address	Military Road
City, State, Postal Code	Port Kembla, NSW, 2505
Country	Australia
Legal Description	Lot 1 in Deposited Plan 811699 at Port Kembla, Local Government Area Wollongong, Parish of Wollongong, County of Camden.
Ownership	Port Kembla Copper Pty Ltd
Zoning	B4 – Mixed Use
Local Environmental Plan	Wollongong Local Environmental Plan 2009
Land Area	2.19 hectares

The site is approximately trapezoidal in shape and covered with grass in the south eastern and north western portions. The central portion of the site (surrounding the recently demolished school building) is paved with concrete. Bitumen basketball and netball courts are located immediately to the north, north-west and north east of the former building. The site now is vacant and fenced from public access.

2.2 Surrounding Land Use

The main land uses surrounding the site are summarised below:

- North: Electrolytic Street, beyond which is the former PKC smelter and refinery and other heavy industrial sites;
- North east: Reservoir Street, beyond which is MM Kembla Pty Ltd (heavy industry);
- East: Marne Street, beyond which is residential land;
- South: Military Road, beyond which is residential land; and
- West: Military Road, beyond which is residential and commercial/light industrial land. A BP petrol station is located approximately 100 m west of the site.

The site is located approximately 900 m south of Port Kembla Outer Harbour, 750 m north east of Coomaditchy Lagoon and 700 m west of the Tasman Sea.

2.3 Site History

The current Certificate of Title for the site indicates that the site is owned by Port Kembla Copper Pty Ltd.

The site was used as a primary school from 1916 until 2002.

A review of historical aerial photographs for the site indicates the land use surrounding the site has remained relatively constant since 1951, consisting of:

- North and north east – heavy industry.
- East and south – residential.



- West and north-west – residential and commercial.

Historical quarrying and filling appears to have occurred approximately 200 m east of the site. A detailed review of the site history is included in the Phase 1 ESA (Golder, November 2012).

2.4 Topography

The building that remained until 2013, and recently demolished during this investigation (**Figure 2**), was located on the crest of a hill, with the ground surface sloping down from the building in every direction. The steepest slopes are towards the north and south east. The topographic map (10m contour interval, (1990) Soil Landscape Series 1:100,000 Sheet of Wollongong – Port Hacking 9029-9129) of the area indicates that the elevation of the site ranges from 20m Australian Height Datum (AHD) at the northern tip of the site to 30m AHD in the southern portion of the site. The topographic map indicates that the site exists on the northern end of a ridge line that runs from the north-west to south-east.

Retaining structures/embankments border the site along Electrolytic, Reservoir and Marne Streets. The site is approximately 3 m higher than Electrolytic Street in the north and approximately 1.8 m higher near the intersection of Electrolytic and Reservoir Streets. The site is approximately 2 m higher than the adjacent ground level along Marne Street.

2.5 Geology and Hydrogeology

Geological and hydrogeological information for the site and/or surrounding area (250 m) is summarised in **Table 2**.

Table 2: Site Geological and Hydrogeological Information

Geology	The Geological Survey of N.S.W. Department of Mineral Resources (1985) Geological Series 1:100,000 Sheet of Wollongong – Port Hacking 9029-9129 maps the geology underlying the site as the Dapto Latite, described as melanocratic, coarse grained and porphyritic Latite. A URS Australia Pty Limited (URS) (February 2006) soil and groundwater investigation at the site intersected the Dapto Latite under the site at depths ranging from 4.4 mbgl (monitoring well D1) to 5.2 mbgl (monitoring well D4). Weathered Dapto Latite was observed to crop out in several areas surrounding the school, including: ■ Adjacent to Military Road (near the former school building); ■ At the intersection of Marne Street and Military Road (in the grass verge next to the foot path); ■ Near the intersection of Reservoir Street and Marne Street (in the grass verge next to the foot path); and ■ Near the intersection of Electrolytic Street and Military Road (near the western corner of the site). The materials overlying bedrock were reported by URS (February 2006) as fill or possible fill to between 0.8 m bgl (metres below ground level) in monitoring well D1 and 0.5 m bgl in monitoring well D4, overlying natural clay and silt soils. According to Graeme Waller and Associates (August, 1996), possible slag and CWR were present in the western corner of the site. Also, slag and CWR were observed during the site walkover on 8 June 2012, at the ground surface in the northern and western portions of the site as part of the Phase 1 ESA (Golder, 2012).
Approximate Depth to Groundwater	Two groundwater monitoring wells (D1 and D4 - see Figure 2) were installed at the site (URS, 2006) and form part of the groundwater



	monitoring network for the adjacent PKC smelter and refinery. During the July 2011 monitoring round the water level in these wells were recorded as 3.80 mbgl (D1) and 5.90 mbgl (D4) (Golder, 2011). Groundwater elevations at these wells were 29.67 mAHD (D1) and 25.51 mAHD (D4). Both of the wells are installed in bedrock. Shallow (possibly perched) groundwater was observed seeping from the northern embankment of the site onto Electrolytic Street during the Phase 1 ESA (Golder, November 2012).
Inferred Groundwater Flow Direction	The site is located at the crest of a hill and is likely to form a local recharge area and groundwater divide. Groundwater in the Dapto Latite is known to move north towards Port Kembla Harbour (Golder, 2011) and may also move southwest toward Coomaditchy Lagoon. Possible perched groundwater appears to be moving north towards Electrolytic Street, based on observed seeps from the retaining wall along this site boundary. Perched water (if present) could also move in other directions away from the topographic high located on the central southern portion of the site.

2.6 Previous Site Investigations

Seven reports obtained from PKC provided information on the condition of the site – in particular the potential for contamination at the site. A summary of the scope of works and outcomes of these investigations are presented in the following sections.

2.6.1 Graeme Waller & Associates (August 1996), Environmental Lead Assessment, Port Kembla Public School

Graeme Waller and Associates conducted an assessment of lead in the surficial soils of the Port Kembla Public School. The report was submitted to the NSW Department of School Education and identified potential sources of lead impacts as airborne particulate fallout from both motor vehicle emissions and industrial sources, and from lead based paints.

Many of the soil samples collected across the site were described as containing fused black material (possible slag), black grit, and black shale (possible CWR). The samples with the highest concentrations of lead generally coincided with the presence of these materials in the soil.

2.6.2 Port Kembla Copper (October 2000), Port Kembla Community Soil Monitoring Programme Post Establishment Soil Plot Report

PKC undertook an investigation into the long term impacts of lead emissions from the smelting and refining operations on soil quality with the Port Kembla area. The investigation included establishment of 12 soil monitoring plots of imported virgin excavated natural material (VENM) soil of known chemical composition that was capped with turf. This report outlines the initial placement of the soil plots (one of which is situated within the site) and the initial baseline analysis of the soil. The results of subsequent sampling (if conducted) were not able to be located in PKC's archives.

2.6.3 Graham Brooks and Associates (February 2002), Heritage Assessment, Port Kembla Public School

Graham Brooks and Associates prepared a heritage assessment for PKC prior to their purchase of the site. The assessment outlined the historical context of the former Port Kembla Primary School and provided an assessment of heritage significance of the site and buildings that were present on the site. The assessment identified that the first school building was constructed in 1916 (after the Electrolytic Refining and Smelting (ER&S) company began operations in Port Kembla in 1907 (Wollongong Council Website)). An extension to the northern portion of this was indicated to have occurred in 1931. Construction of the former infants school building commenced in 1952, with the building being opened in 1953.



A description is provided of the 1916 building as being “covered with an asbestos slate roof” and two sheds that existed along the Electrolytic Street and Reservoir Street boundaries are described as having corrugated asbestos roofing.

2.6.4 Port Kembla Copper (July 2002), Internal Memorandum, Old Port Kembla Primary School Soil Assessment

PKC completed a soil assessment at the site in June 2002, with samples collected from six areas of the site. Soil samples were collected from 0-50 mm and 100-150 mm below ground level at five locations within each of the six areas (total of 60 samples). The soil samples were analysed for arsenic, cadmium, chromium, copper, nickel, lead and zinc.

The results of the soil analyses are summarised as follows:

- Arsenic concentrations were less than the site adopted investigation levels for arsenic including the NEPM¹ HIL²-A, HIL-D, HIL-E and HIL-F. Concentrations of arsenic in four soil samples exceeded the NEPC (1999) arsenic EIL³;
- Cadmium concentrations were less than the site adopted investigation levels for cadmium including the HIL-A, HIL-D, HIL-E and HIL-F. Concentrations of cadmium in nine soil samples exceeded the NEPC (1999) cadmium EIL;
- Chromium concentrations were less than the site adopted investigation levels for chromium including the HIL-A, HIL-D, HIL-E and HIL-F and EIL;
- Nickel concentrations were less than the site adopted investigation levels for nickel including the HIL-A, HIL-D, HIL-E and HIL-F and EIL;
- Zinc concentrations were less than the site adopted investigation levels for zinc including the HIL-A, HIL-D, HIL-E and HIL-F. Concentrations of zinc in 18 soil samples exceeded the NEPC (1999) zinc EIL;
- Copper:
 - 17 soil concentrations exceeding HIL-A,
 - One soil concentration exceeding HIL-D,
 - Five soil concentrations exceeding HIL-E,
 - No soil concentrations exceeding HIL-F, and
 - 55 soil concentrations exceeding EIL.
- Lead:
 - 10 soil concentrations exceeding HIL-A,
 - No soil concentrations exceeding HIL-D,
 - Two soil concentrations exceeding HIL-E,
 - No soil concentrations exceeding HIL-F, and
 - Two soil concentrations exceeding EIL.

2.6.5 Zweep & Connolly (2002), Valuation and Acquisition Report on Commercial Development Property at Military Road, Port Kembla, 2505

Zweep & Connolly prepared a valuation report for the site in 2002. The report identified potential impacts at the site related to filling and fallout from the adjacent PKC copper smelter.

¹ NEPM classification as per previous NEPM (NEPC, 1999)

² HIL - Health Investigation Level

³ EIL - Ecological Investigation Level



2.6.6 URS (February 2006), Soil and Groundwater Investigation, Port Kembla Copper Smelter Facility, Port Kembla, NSW

URS was engaged by PKC to undertake a soil and groundwater investigation of the PKC smelter and refinery site located to the north. These works were commissioned in response to the smelter and refinery site being declared as presenting a potential significant risk of harm by the NSW EPA⁴ on 13 February 2004. The “chemicals of interest” identified in the declaration were arsenic, cadmium copper lead manganese sulfate and zinc and groundwater acidity.

Two monitoring wells (D1 and D4) were installed within the former Port Kembla Primary School (refer to **Figure 2**) as part of the URS investigation. These wells were originally installed to assess (background) groundwater quality up gradient of the PKC smelter and refinery.

Soil samples collected during installation of the two monitoring wells at the site (D1 (1-1.5m and 4.2-8m) and D4 (1.5-2m and 5.4-8m)) both contained concentrations of copper greater than the site adopted EIL, and sample D4 5.4-8 contained copper at a concentration in excess of the site adopted HIL-A copper concentrations, but was less than the HIL- D, HIL-E and HIL-F copper concentrations. The concentrations of other metals in the samples collected from D1 and D4 were less than the respective adopted HIL and EIL criteria.

Groundwater sampled from monitoring well D4 did not contain concentrations of the “chemicals of interest” greater than the respective ANZECC/AMCANZ (2000) marine 95% trigger values, with the exception of copper (0.01 mg/L) and zinc (0.024 mg/L). Well D1 was dry and not able to be sampled.

2.6.7 URS (November 2007), Groundwater Monitoring Port Kembla Copper, May 2007 Round

URS was engaged by PKC to conduct a round of groundwater monitoring at all accessible monitoring wells located on and surrounding the PKC smelter and refinery. The chemicals of potential concern (COPC) in groundwater were identified as arsenic, cadmium, copper, lead, manganese, nickel, and zinc.

Groundwater samples were collected from on-site monitoring wells D1 and D4 during this round of monitoring. The concentrations of the COPC were less than the respective ANZECC/AMCANZ (2000) marine 95% trigger values, with the exception of the following:

- Monitoring well D1 - copper (0.03 mg/L) and zinc (0.032 mg/L)
- Monitoring well D4 - copper (0.117 mg/L), nickel (0.09 mg/L) and zinc (0.078 mg/L).

2.6.8 Golder (November 2012), Phase 1 Environmental Site Assessment – Former Port Kembla Primary School

Golder was retained by PKC to conduct a Phase I ESA of the former Port Kembla Primary School (Golder, November 2012). The Phase 1 ESA included a review of historical aerial photographs, certificates of title, local topography, geology and hydrogeology, local council, EPA and Dangerous Goods records and walkover of the site and surrounding properties. On the basis of the information gathered during this investigation, Golder concluded impacted soils previously reported at the Site (refer to above sections) may be associated with the following historical activities:

- On Site – filling of land, use of asbestos materials and possible use of lead paint.
- Off Site – fallout from neighbouring industrial sites.

Golder (November 2012) recommended an intrusive investigation to:

- Assess the nature and extent of potential impacts to soil and groundwater under the site

⁴ At the time of the declaration the NSW EPA was also known as the NSW Department of Environment and Conservation (DEC), but the NSW EPA was still the regulatory body under the CLM Act 1997.



- Develop management/remedial measures (if required) to make the land suitable for its intended future land use
- Assess whether a notification should be made to the NSW EPA of the presence of contamination at the Site in accordance with the Guidelines on the Duty to Report Contamination under the Contaminated Land Management (CLM) Act 1997.

2.7 Site Areas and Chemicals of Potential Concern

Table 3 below presents a summary of the site areas of potential concern and respective chemicals of potential concern (COPC) as presented in the Phase 1 ESA (Golder, 2012).

Table 3: Areas and Chemicals of Potential Concern

Key Areas of Interest	Chemicals of Potential Concern
On-Site	
Areas filled with slag and CWR (predominantly northern and western portions, but may be under large areas of the site)	Metals, combustible materials and ammonia
Suspected asbestos containing materials comprising cement fragments observed on the concrete hard stand, south of the site building (since demolished)	Asbestos
Surficial soil impacts from historical fallout of airborne deposits from nearby industrial activities	Metals
Lead paint residue - in soil surrounding (demolished and remaining buildings)	Lead
Mounded/stockpiled soil of unknown composition	Unknown
Areas of demolished buildings/demolition works	Asbestos and lead
Seepage water in northern portion of site near Electrolytic Street	Metals and ammonia
Septic tank	Nutrients, metals, organic compounds
Off-Site	
Petrol Station on Church Street	TPH ⁵ , BTEX ⁶ , PAH ⁷ and lead
Former quarry 200 m east of the site	Unknown
Port Kembla Copper	Metals ⁸

It is noted that since the site is located on the crest of a hill and forms a local high point, contaminants associated with surrounding properties (ie off site locations identified in Table 3, above) are considered unlikely to impact upon soil, groundwater or surface water quality at the site.

⁵ Petroleum Hydrocarbons measured as Total Petroleum Hydrocarbons (TPH)

⁶ BTEX measured as Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX)

⁷ PAH measured as Polynuclear Aromatic Hydrocarbons (PAH)

⁸ Metals: arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium & zinc



3.0 FIELD INVESTIGATIONS

3.1 Potential Contamination Sources

Based on the results of the Phase 1 ESA (Golder, November 2012), the on-site areas of potential concern (refer to Section 2.7) were targeted for sampling and included the following:

- Areas filled with slag and CWR, predominantly northern and western portions of the site.
- Suspected asbestos containing cement fragments (observed on concrete hard stand south of former building).
- Surficial soil impacts from historical fallout of airborne deposits from nearby industrial activities.
- Lead containing paint residues in soils surrounding demolished and remaining buildings.
- Mounded/stockpiled soil of unknown composition.
- Areas of demolished buildings/demolition works (main building).
- Seepage water in northern portion of site near Electrolytic Street.
- Septic tank.

3.2 Sampling Plan and Methodology

3.2.1 Soil Sampling

The soil investigation program completed as part of the DSI is outlined below in **Table 4**. Test pits, off site hand augers and bore holes locations are shown in **Figure 2**.

Table 4: Soil Sampling Scope

Activity	Details
Number of Sample Investigation Points	30 sampling points on site were investigated including 24 test pits and 6 bore holes. The number of sample locations is consistent with those recommended in the Sampling Design Guidelines (NSW EPA, 1995).
Test Pitting (First Stage of Works)	A total of 24 test pit locations were excavated using an excavator during 25 - 27 June 2013. The test pits continued to a minimum of 0.3 m into the natural soil profile, with the exception of TP16 (which was terminated due to the presence of asbestos fill). The locations and elevations of the test pits were recorded using a Global Position System (GPS).
Off-site Hand Auger (First Stage of Works)	Two background soil samples were collected using a hand auger on 27 June 2013 at nearby vacant residential lots (OL1 and OL2). The depths of these bore holes was 0.5mbgl and 0.7 mbgl, respectively.
Soil Bores (Second Stage of Works)	Six bore holes were drilled on site using a Geoprobe rig on 9 and 10 October 2013. All bore holes were cleared using hand auger to a depth of 0.6 mbgl and drilled to a minimum of 1.1 m into the natural soil profile. The locations and elevations of the soil bores were recorded using a GPS.
Soil Bores Drilled and Target Depth	The six bore holes were advanced to maximum depth of 2.6 mbgl and generally terminated on weathered bedrock. Groundwater was not evident in the soil bores, with the exception of BH4 (where water seepage was observed at 0.5 mbgl). Bore hole BH4 was converted to shallow monitoring well (MW04), whilst monitoring wells were also installed (into boreholes) next to the following test pits, all of which



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

Activity	Details
	had evidence of water seepage when excavated during the first stage of field works: TP 20 (MW1), TP26 (MW2) and TP27 (MW3). Bore holes were drilled using a truck mounted drill rig with solid stem augers. Push tubes were used to collect the soil samples
Soil Sampling (Tests pits, hand augers (off-site) and bore holes)	Soil samples were collected at the surface (directly below ground surface level) and at approximately 0.5 m intervals thereafter and/or where evidence of contamination were noted through field observations. Based upon field observations and PID screening, up to two samples per location were nominated for laboratory analysis. This included samples of natural soils underlying the fill soil profile. Soil samples were collected from soil profiles suspected to contain asbestos containing materials, including TP3, TP7, TP10, TP11, TP12, TP12A, TP15, TP16A, TP16B and TP20.
Decontamination	Soil sampling equipment was decontaminated between each sampling event using a contaminant-free detergent (Decon 90), followed by a rinse by potable water between each location. All drilling equipment was decontaminated prior to and on completion of each sampling location. The drilling rig was also decontaminated on completion of the works.
Field Records	All bore holes were logged in accordance with AS1726-1993 and the United Soil Classification System (USCS). Odours were recorded by the Golder site supervisor during the collection of soil samples. The sample descriptions, sample numbers, results of all field measurements, were recorded in the field logs and are attached as Appendix C.
Sample Preservation	Samples were placed in tightly packed laboratory supplied containers to minimise headspace. Soil samples were clearly labelled with unique sample identification numbers and stored in a chilled cooler box prior to dispatch under chain-of-custody (COC) procedures to NATA accredited laboratories (ALS Laboratory Group (ALS) for primary samples and quality control samples and Enviro Lab (ELS) for inter-duplicate samples), accredited for the selected analysis.
Disposal of Soil Cuttings	Sampling locations were backfilled with the soil cuttings, where possible. The soil cuttings from drilling was, however, stored in sealed and appropriately labelled buckets and disposed of by PKC (in accordance with NSW EPA requirements).
Sample Analysis	Samples were tracked in the field and laboratory using COCs. Samples were analysed for the following analytes by ALS: Metals (10 metals): Up to 2 primary samples per location TRH / BTEX / PAH/ Phenols / OCPs⁹: 1 primary sample per location Ammonia as N¹⁰: 1 primary sample per location Total N +TKN+NO2+NO3+NH3+Total Phosphorus¹¹ (2 locations around the septic tank area): Up to 2 primary samples per location Asbestos (concrete hard stand south of building and demolished building areas

⁹ OCPs measured as Organochlorine Pesticides (OCPs)

¹⁰, ¹¹ Nutrients



Activity	Details
	and demolition fill): 10 primary samples collected, which were greater than the 8 proposed in the Golder (2013) SAQP. 15 samples of natural and fill materials collected from the site were analysed for pH, cation exchange capacity and particle size distribution for purpose of establishing relevant site EILs. The samples collected from off-site locations were analysed for metals (10 metals).
Quality Control (QC) samples	Three field duplicates (analysed by ALS Laboratory) and three field triplicates (analysed by ELS Laboratory) were collected as part of the soil sampling program. These samples were analysed for the same analytes as the primary samples. Three rinsate blanks and three trip blanks were collected over a 3 day sampling program. The rinsate and trip blanks were analysed in accordance with recommendation provided in Golder (2013) SAQP.

3.2.2 Groundwater Sampling

The groundwater investigation program completed as part of the DSI is outlined below in **Table 5**. Sample locations are shown in **Figure 2**.

Table 5: Groundwater Sampling Scope

Activity	Details
Well Construction	Four monitoring wells were constructed using 50 mm diameter Class 18 uPVC with machine slotted (0.4 mm) screen surrounded by a gravel pack across the targeted groundwater table. The gravel pack (1-2 mm graded washed sand) was placed from the base of the bore hole to 0.1 m above the well screen. Bentonite pellets placed on the top of the sand filter pack (approximately 0.2 m thick). The bentonite was then hydrated to promote sealing and topped with concrete. Wells were fitted with lockable caps and a steel gatic cover finished at ground level.
Well Development	Upon completion, each was proposed to be developed by air lifting, but all four wells were found to be dry.
Well Gauging, Purging and Sampling	Groundwater sampling was proposed one week after well development, using dedicated sampling equipment to avoid cross-contamination. However, as no water was present in shallow monitoring wells MW1 – MW4, sampling of these wells was not possible. Existing deep wells (D1 and D4) were sampled during July 2013.
Decontamination	Decontamination was not required for groundwater purge and sample equipment as all equipment is dedicated. The oil / water interface probe was decontaminated for the two deep wells sampled using Decon 90 solution and rinse by potable and deionised water between each location.
Sample Preservation	Samples were placed in laboratory supplied bottles containing the appropriate preservatives. Samples were stored in an ice chilled cooler-box whilst on site and in transit to the laboratory. Samples collected for metal analysis were filtered in the field, using 0.45 µm filters and preserved with nitric acid.



Activity	Details
Disposal of Purged Groundwater	Purge water and decontamination fluids were drummed on-site in 205 L drums and disposed of by PKC in accordance with NSW EPA requirements.
Well Survey	The newly installed wells were surveyed to metres Australian Height Datum (mAHD) and the easting and northing coordinates locations to Australian Map Grid (AMG). The survey was commissioned by PKC.
Sample Analysis	Samples were tracked in the field and laboratory using COCs. Samples were analysed for the following analytes: Metals (10 metals): two primary samples (D1 and D4) TRH / BTEX / PAH/ Phenols / OCPs: two primary samples (D1 and D4) Ammonia as N, Total N +TKN+NO₂+NO₃+NH₃+Total Phosphorus: two primary samples (D1 and D4)
Quality Control (QC) Samples	One field duplicate and one field triplicate sample were planned to be collected for the groundwater sampling program. QC samples were proposed to be analysed for the same analytes as the primary samples. In addition one rinsate blank and one trip blank were planned to be collected (assuming a one day sampling program). It was proposed that the rinsate blank would be analysed for metals, TRH / BTEX / PAH/ phenols / OCPs and the trip blank would be analysed for TRH (C₆-C₁₀ range) and BTEXN. As only two wells contained groundwater the QC program proposed in the Golder (2013) SAQP was reduced and only a rinsate blank was collected.

Monitoring locations were selected according to the following rationale:

Table 6: Monitoring Well Location Selection Rationale.

Area/Source	Proposed Investigation Strategy	Monitoring Well Location
Filled ground	Based on observations of water seepage during the preceding soil sampling program and site walkover, three monitoring wells were installed near the site boundaries.	MW1 MW2 MW3
Septic tank - potential for leakage or overflow from septic tank.	One groundwater monitoring well was located in the vicinity of the former septic tank in a borehole in which water seepage was observed.	MW4 (BH04)

3.3 Analytical Program

3.3.1 Soil

Soil samples were analysed for site identified COPC. The soil analytical program is summarised in **Table 7** with the soil assessment criteria discussed in Section 4.2



Table 7: Soil Analytical Program

Analyte	Number of Analyses			
	Primary	Duplicate	Triplicate	Total
Heavy metals (As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, Zn) ¹²	64	3	3	70
Benzene, toluene, ethylbenzene and xylene (BTEX)	31	3	3	37
Total Petroleum Hydrocarbon (TPH) and Total Recoverable Hydrocarbons (TRH)	31	3	3	37
Phenols	31	3	3	37
Polycyclic aromatic hydrocarbons (PAHs)	31	3	3	37
Organochlorine pesticides (OCPs)	31	3	3	37
Ammonia as N	31	3	3	37
Total N +TKN+NO ₂ +NO ₃ +NH ₃ +Total Phosphorus	3	- ¹³	-	3
Asbestos (ID in bulk samples)	10	-	-	10
Asbestos (Fibres in soil)	7	-	-	7
pH, cation exchange capacity and particle size distribution	15	-	-	15

Consistent with the SAQP (Golder, 2013), two soil samples per sampling location were analysed for metals, and a minimum one sample per location for TPH, TRH, BTEXN, PAH, OCPs. The soil samples selected for TPH and BTEX analysis were all within the top 1 m in the sandy fill layer.

3.3.2 Groundwater

Groundwater samples were analysed for the COPC. The groundwater analytical program is summarised in **Table 8** with the groundwater assessment criteria discussed in Section 4.4.

Table 8: Groundwater Analysis Programme

Analyte	Number of Analyses		
	Primary	Duplicate ¹⁴	Total
Heavy metals (As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, Zn)	2	-	2
Polycyclic aromatic hydrocarbons (PAHs)	2	-	2
Benzene, toluene, ethylbenzene and xylene (BTEX)	2	-	2
Total Petroleum Hydrocarbon (TPH) and Total Recoverable Hydrocarbons (TRH)	2	-	2
Organochlorine pesticides (OCPs)	2	-	2
Phenolic Compounds	2	-	2
Total N +TKN+NO ₂ +NO ₃ +NH ₃ +Total Phosphorus	2	-	2

4.0 ASSESSMENT CRITERIA

4.1 General

Recently, the *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM)* was amended (NEPC, May 2013). The amended ASC NEPM includes updated risk-based Health Investigation Levels (HIL) for selected organic and inorganic chemicals in soils. It also incorporates the Health Screening Levels (HSLs) for petroleum hydrocarbons in soil, soil vapour and groundwater as well as Ecological Screening Levels (ESLs) for petroleum hydrocarbons in soil and Ecological Investigation Levels (EILs) for selected inorganic and organic chemicals in soil.

The guidelines used for the assessment of environmental data obtained during the DSI are described in the following sections.

¹² As: arsenic, Cd: cadmium, Cr: chromium, Cu: copper, Pb: lead, Mn: manganese, Hg: mercury, Ni: nickel, Se: selenium and Zn: zinc.

¹³ - means not analysed

¹⁴ As only two wells contained water the QC program proposed in the Golder (2013) SAQP was reduced and no samples were collected.



4.2 Soil Investigation Levels

4.2.1 Canadian Guideline for TPH fractions.

The ASC NEPM (NEPC, 2013) Health Screening Levels (HSLs) for petroleum contaminants are based on assumed sources of impact being consistent with typical Australian fuels. These are not considered appropriate to apply to the analytical data at this site where atypical petroleum sources may be present (not drum storage or petrol sources on site). The Canadian Council of Ministers of the Environment (CCME) (2008a) presents screening values for selected petroleum contaminants which are considered appropriate to assess impacts from atypical petroleum sources. The CCME (2008a) provides Tier 1 risk based screening levels for TPH in surface soils that assess both human health and environmental concerns for a variety of land uses. The derivation of the CCME Tier 1 guidelines is broadly consistent with the risk based methodology of the ASC NEPM HSLs including:

- The TPH fractions and toxicological reference concentrations to assess the fractions are based on the TPH Criteria Working Group (TPHCWG) approach using aromatic and sub aliphatic sub fractions (Edwards et al 1997). CCME (2008a) state that the four broad physio chemical fractions used to derive the guidelines (F1: C₆-C₁₀, F2: >C₁₀ to C₁₆, F3: >C₁₆ to C₃₄ and F4: C₃₄₊) address the diversity of TPH impact sources, including various crudes and product admixtures.
- CCME (2008a) recommends that BTEX compounds be subtracted from the F1 fraction in applying the Tier 1 screening values.
- CCME (2008a) recommends that if determinations of target PAH have been made these should be extracted from the appropriate petroleum hydrocarbon fraction (i.e. F2 for naphthalene).
- The land use scenarios include a '*Commercial*' category: where the primary activity is commercial (e.g., shopping mall) and there is free access to all members of the public, including children. The use may include, for example, commercial day-care centres. It does not include operations where food is grown. While this is more conservative than the HIL/ HSL- D which does not include provision of sensitive uses such as childcare centers. As such this is an appropriate and conservative scenario.
- The land use scenario include a '*Residential/Parkland*' category: where the primary activity is residential or recreational activity. The ecologically-based approach assumes parkland is used as a buffer between areas of residency. This is an appropriate and conservative scenario.

The Tier 1 screening levels are based on the most conservative pathway whether it is human health, environment, protection of potable groundwater resources or management limits. The Technical Supplement to these guidelines (CCME 2008b) provides the risk-based screening levels for each pathway, including direct contact (ingestion and dermal contact) and vapour inhalation (indoor) for coarse and fine soil. These two specific pathways (direct contact and vapour inhalation) for coarse grained soils have been selected as relevant as the ecological pathways are assessed through the application of the ESLs provided in the ASC NEPM (NEPC, 2013) and the groundwater on site is not a potable resource.

The soil samples selected for TPH and BTEX analysis were all collected within the surface 1 m in the sandy fill layer and therefore the soil type sand has been selected as the most appropriate.

4.2.2 Health Investigation Levels (HILs)

Health investigation levels (HILs) are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 screening assessment) of the assessment of potential risks to human health from chronic exposure to contaminants. The HILs have been derived for a range of metals and organic substances and are generic to all soil types. The HILs are based on four land use settings including HIL-A (residential with accessible soil), HIL-B (residential with minimal soil access), HIL-C (recreational, public open space) and HIL-D (commercial / industrial).



PKC understand the site is proposed to be developed for mixed business and medium density residential land uses. Accordingly, HILs for the following land use categories have been applied to assessing the soil sample results:

- HIL B (residential with minimal opportunities for soil access, includes high-rise buildings and apartments).
- HIL D (commercial/industrial, includes shops, factories, offices and industrial sites).

4.2.3 Asbestos Health Screening Levels

The amended ASC NEPM (NEPC, 2013) includes Health Screening Levels (HSLs) for asbestos in soil, which are based on scenario-specific likely exposure levels, and adopted from Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA DoH, 2009).

HSLs B and D (for high density residential land use and commercial/industrial land use, respectively) are considered appropriate.

4.2.4 Ecological Based Guidelines

4.2.4.1 General

The amended ASC NEPM (NEPC, 2013) includes updated risk-based Ecological Investigation Levels (EILs) for selected organic and inorganic chemicals in soils. It also incorporates the Ecological Screening Levels (ESLs) for petroleum hydrocarbons in soil.

There are three land use scenarios considered for the EILs/ESLs: areas of ecological significance; urban, residential and public open space; and commercial/ industrial. ESL and EILs have been adopted for the following exposure scenarios:

- The urban residential and public open space exposure scenario. This is equivalent to the combined exposure scenarios of residential A & B, and is therefore considered relevant for the site; and
- The commercial /industrial scenario.

EILs apply principally to the top 2 m of soil and are dependent on various other site specific soil physiochemical properties including grain size, pH and cation exchange capacity.

4.2.4.2 Ecological Screening Levels (ESLs)

The amended ASC NEPM (NEPC, 2013) includes ESLs for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon fractions for assessment of risk to terrestrial ecosystems. ESLs are provided for several land use scenarios and soil types. ESLs are relevant for the root zone in soil which corresponds to the top 2 m of the finished level of a site. As identified above, the ESL for urban residential and for commercial/ industrial land use are applied.

ESLs are provided for coarse and fine soils. Two soil types have been identified on site - sandy fill and natural clay. As all soil samples analysed for TRH and BTEXN were collected from the sandy fill layer, the coarse soil values were applied.

The ESLs selected for the site are provided in the **Table 8** (attached) and summarised in Table 11 below.

4.2.4.3 Ecological Investigation Levels (EILs)

EILs for urban residential and for commercial/ industrial land uses have been applied for the DSI. Under the amended ASC NEPM (NEPC, 2013), a method is provided for the calculation of site specific EILs for zinc, copper, chromium (III) and nickel. Generic EILs are also available for lead, arsenic, and naphthalene. Site specific EILs are calculated using the following formula:

$$\text{EIL} = \text{ACL} + \text{ABC}$$



Where:

ACL = Added Contaminant Limit. The ACL is calculated based on soil specific properties such as pH, cation exchange capacity (CEC) and clay content.

ABC = Ambient Background Concentration, the ABC, is the naturally occurring level of the contaminant at the site. This can be measured by using the concentration of a soil sample collected at a reference site not impacted by the contaminant source. Two locations from nearby vacant residential lots (OL1 and OL2) were selected to provide the ambient back ground concentrations (ABC) (**Figure 2**). Four samples were collected from these locations and analysed for metals, three of the samples reported similar concentrations however one sample (OL2_0.0_0.2) had elevated concentrations of arsenic, copper, lead, manganese and zinc (refer to Table 1 in attached Tables). This sample was not considered to represent the ambient background concentrations and was not included in the EIL calculation. The average metal concentrations from the three remaining samples (OL1_0.1-0.2, OL1_0.3-0.5, OL2_0.3-0.5) were used to determine the ABC. Table 10 (below) shows the results obtained for ABC:

Table 9: Ambient Background Concentrations (ABC)

Contaminant	Units	Average concentration
Zinc	mg/kg	37
Copper	mg/kg	75
Chromium	mg/kg	19.33
Nickel	mg/kg	4.67

Site specific soil characteristics including grain size, pH, cation exchange capacity are required to calculate the ACL. EILs have been calculated separately for the two soil types (sandy fill and natural clay) identified on site. Site soil properties for EILs are summarised in **Table 10** below:

Table 10: Soil Properties Used in ACL Calculation

Soil Property	Units	Average value used in ACL calculation (Sand) –	Average value used in ACL calculation (Clay)
pH	pH Units	5.59	5.83
Clay in soils <2um	% (w/w)	20.50	43.57
Cation Exchange Capacity	Cmol/kg	9.78	20.83

The EILs calculated for the site are provided in the **Table 9** (attached) and are summarised in Table 11 below.

4.2.5 Management Limits

In addition to the HSLs and ESLs, the amended ASC NEPM (NEPC, 2013) also includes 'Management Limits' that are designed to avoid or minimise the potential effects of petroleum hydrocarbons such as:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosive hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.



The Management Limits have also been considered in the DSI. The management limits are provided for coarse and fine soils. As noted previously, however, soil samples analysed for TRH and BTEXN were collected from the site fill materials and as such only sand (coarse) values were applied.

4.3 Summary

A summary of the relevant guidelines for the site are identified in

Table 11 below:



4.3.1 Proposed Soil Investigation Levels

Table 11: Proposed Soil Investigation Levels (in mg/kg)

Analyte	ECOLOGICAL INVESTIGATION LIMITS				MANAGEMENT LIMITS		HEALTH INVESTIGATION LIMITS			
	ESL - Urban residential / coarse	ESL - Industrial / Coarse	EIL - Urban residential - coarse / fine	EIL (Industrial) coarse / fine	Manag. limits Urban Residential	Manag. limits Commercial & Industrial	HIL-B	HIL-D	CCME - Residential - Coarse	CCME - Commercial - Coarse
Benzene	50	75	-	-	-	-	-	-	-	-
Toluene	85	135	-	-	-	-	-	-	-	-
Ethylbenzene	70	165	-	-	-	-	-	-	-	-
Total xylene	105	180	-	-	-	-	-	-	-	-
Naphthalene	-	-	170 / 170	370 / 370	-	-	-	-	-	-
F1	180*	215*	-	-	700	700	-	-	12,000	19,000
F2	120*	170*	-	-	1,000	1,000	-	-	6,800	10,000
F3	300	1,700	-	-	2,500	3,500	-	-	15,000	23,000
F4	2800	3,300	-	-	10,000	10,000	-	-	21,000	RES
Arsenic	-	-	100 / 100	160 / 160	-	-	500	3,000	-	-
Cadmium	-	-	-	-	-	-	150	900	-	-
Chromium (III)	-	-	420 / 420	680 / 680	-	-	-	-	-	-
Chromium (VI)	-	-	-	-	-	-	500	3,600	-	-
Copper	-	-	205 / 355	265 / 355	-	-	30,000	240,000	-	-
Lead	-	-	1,100 / 1,800	1,100 / 1,800	-	-	1,200	1,500	-	-
Mercury	-	-	-	-	-	-	120 ¹ / 30 ²	730 ¹ / 180 ²	-	-
Nickel	-	-	175 / 275	395 / 465	-	-	1,200	6,000	-	-
Zinc	-	-	170 / 370	170 / 370	-	-	60,000	400,000	-	-
Total PAHs	-	-	-	-	-	-	400	4,000	-	-
Benzo[a]pyrene	1.4	1.4	-	-	-	-	-	-	-	-
Carcinogenic PAHs (as B[a]P TEQ)	-	-	-	-	-	-	4	40	-	-



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

Analyte	ECOLOGICAL INVESTIGATION LIMITS				MANAGEMENT LIMITS		HEALTH INVESTIGATION LIMITS			
	ESL - Urban residential / coarse	ESL - Industrial / Coarse	EIL - Urban residential - coarse / fine	EIL (Industrial) coarse / fine	Manag. limits Urban Residential	Manag. limits Commercial & Industrial	HIL-B	HIL-D	CCME - Residential - Coarse	CCME - Commercial - Coarse
Phenol	-	-	-	-	-	-	45,000	240,000	-	-
Pentachlorophenol	-	-	-	-	-	-	130	660	-	-
Aldrin + Dieldrin	-	-	-	-	-	-	10	45	-	-
Chlordane	-	-	-	-	-	-	90	530	-	-
DDT, DDD & DDE	-	-	-	-	-	-	600	3,600	-	-

Notes:

- No guideline available

¹ denotes criteria for inorganic mercury

² denotes criteria for methyl mercury

B(a)P TEQ – Benzo(a)pyrene toxicity equivalency quotient

ESLs are of low reliability except where indicated by * which indicates the ESL is of moderate reliability

TPH:

F1 = C₆-C₁₀

F2 = >C₁₀ – C₁₆

F3 = >C₁₆ – C₃₅

F4 = >C₃₄ – C₄₀



4.4 Groundwater Investigation Levels

4.4.1 General

Assessment of groundwater should consider the risks posed to all potential receptors on and off the site. An evaluation of both the ecological and the human receptors and pathways of exposure is therefore required. Groundwater Investigation Levels (GILs) relevant to this investigation and adopted by the amended ASC NEPM (NEPC, 2013) include:

- Groundwater HSLs for Vapour Intrusion (NEPC, 2013);
- Australian Drinking Water Guidelines (ADWG) (National Health and Medical Research Council (NHMRC) and Natural Resource Management Ministerial Council (NRMMC) 2011); and
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality ANZECC/ARMCANZ (2000).

4.4.2 Human Health Based Assessment

The application of human health based guidelines for groundwater requires an evaluation of exposure scenarios for the different water bearing zones. It is not expected that shallow or deep groundwater under the site and surrounding residential areas would be suitable for extraction and domestic use due to:

- The perched and ephemeral nature of shallow groundwater under the site.
- The generally low yields for groundwater in the deep aquifer.

Accordingly, human exposure to groundwater is likely to only be via the following pathways:

- Incidental exposure to shallow groundwater during excavations.
- Inhalation of vapour from the shallow groundwater may also form a pathway for exposure to future site users.

The amended ASC NEPM (NEPC, 2013) provides groundwater HSLs for inhalation exposures for TPH and BTEXN. The HSLs are not, however, relevant if groundwater is at depths of less than 2 m bgl. Due to the shallow depth the HSLs cannot be applied to the perched water.

Incidental worker exposure to groundwater during site excavations may occur. For the purpose of this investigation, the groundwater data will be assessed relative to the health-based ADWG (2011) criteria with a factor of 10 applied to account for the limited ingestion potential relative to the drinking water exposure assumptions. This is generally consistent with the approach described in the National Health and Medical Research Council (NHMRC, 2008) Guidelines for Managing Risks in Recreational Water, although is likely to represent a conservative assessment of potential risks.

4.4.3 Ecological Based Assessment Criteria

In accordance with the amended ASC NEPM (NEPC, 2013), the Ecological Investigation Levels used to evaluate the groundwater analytical results have been adopted from ANZECC/ARMCANZ (2000). These guidelines provide environmental based trigger values for concentrations of organic and inorganic chemicals in freshwater and marine aquatic environments.

Due to the location of the site and potential down-gradient receptors (Port Kembla Harbour and Coomaditchy Lagoon), trigger levels for marine and freshwater aquatic ecosystems have been adopted. The 95% level of protection has been adopted. This protection level applies to ecosystems that could be classified as slightly-moderately disturbed.

4.4.4 Proposed Groundwater Investigation Levels

The adopted screening levels are listed below in **Table 12** (below).



DSI - DETAILED SITE INVESTIGATION, FORMER PORT KEMBLA PRIMARY SCHOOL, PORT KEMBLA, NSW

Table 12: Proposed Groundwater Investigation Levels (µg/L)

Analyte	Health Investigation Limits	Ecological Investigation Limits	
	10 x NHMRC 2011 Drinking Water	GIL (Marine Waters) – 95% protection	GIL (Marine Waters) – 95% protection
BTEXN			
Benzene	10	700	950
Toluene	8000	-	-
Ethylbenzene	3000	-	-
Total xylenes	6000	-	-
Naphthalene	-	70	16
Metals (mg/L)			
Arsenic*	0.1	-	0.013
Cadmium*	0.02	0.0055	0.0002
Chromium*	0.5	0.0044	0.001
Copper*	20	0.0013	0.0014
Lead*	0.1	0.0044	0.0034
Manganese*	1	-	-
Nickel*	0.2	0.07	0.011
Selenium*	0.1	-	-
Zinc*	-	0.015	0.008
Mercury*	0.01	0.0004	0.0006
Phenols			
Phenol	-	400	320
2-Chlorophenol	3000	-	-
2,4-Dichlorophenol	2000	-	-
2,4,6-Trichlorophenol	200	-	-
Pentachlorophenol	100	22	10
Polycyclic Aromatic Hydrocarbons			
Naphthalene	-	70	16
Benzo[a]pyrene	0.01	-	-
Acidity			
Sulfate as SO ₄ - Turbidimetric	5000	-	-
Nutrients			
Ferrous Iron	-	0.91	-
Nitrite as N	30	-	-
Nitrate as N	500	-	-
Organochlorine Pesticides (OCP)			
Heptachlor	3	-	-
Endrin	-	0.008	0.02
Endosulfan sulfate	300	0.1	0.2
4,4'-DDT	200	-	-
Methoxychlor	3000	-	-
Sum of Aldrin + Dieldrin	3	-	-
Organophosphorus Pesticides (OPP)			
Diazinon	30	-	-
Chlorpyrifos	100	0.009	0.01
Parathion	100	-	-
Ethion	30	-	-
Azinphos Methyl	30	-	-

Notes

- No guideline available

* denotes units for metals are in mg/l



5.0 INVESTIGATION RESULTS

5.1 Subsurface Observations

The majority of the site is underlain by fill materials, with only locations BH1, BH6, TP29 and TP30 (southern site boundary) and TP8 (eastern boundary) intersecting natural soils from the ground surface. The fill was typically less than 0.5 m thick, but was reported to be up to 2 m thick along the southern, north western and northern boundaries of the site (TP5, TP13, TP16, TP20, TP26 and TP27). The fill generally consisted of brown-black, silty clay and sandy clay. Coal washery reject (CWR) fill material was reported at 10 investigation locations (TP03, TP06, TP09, TP11, TP12, TP15, TP16A, TP27, BH02 and BH04), which are predominantly located in the southern portion of the site. Possible slag material was also reported at BH04, whilst fragments of concrete, glass, brick, ceramic pipe, timber and tiles were observed in near surface fill at a small number of locations.

Suspected asbestos containing materials (ACM) were observed in test pits adjoining the Reservoir Street site boundary (locations: TP12A, TP16A and TP16B) located in the northeast of the site, and in the central-southern portion of the site at TP 10, TP11 and TP15. Samples were taken for laboratory confirmation. Test pit locations TP12A, TP16A and TP16B were abandoned due to the presence of suspected ACM.

The natural soil layer underlying the fill (where present) consisted of gravelly silty clay and clay. Soils overlie bedrock which was typically intersected at less than 1 mbgl, but is greater deeper in the central-southern parts of the site (eg at BH1 – BH6, TP14 and TP25) and along Electrolytic Street (at TP26 and TP28).

Fill and natural soils were typically dry to slightly moist, although wet ground and seepage of water was identified at TP20, TP26, TP27 and BH4.

Spoil containing asbestos was disposed of by PKC.

Photographs of test pits and bore holes/well installations are presented in **Appendix B**. Test pit, offsite hand auger and bore hole logs are included in **Appendix C**.

5.2 Field Screening

5.2.1 Field Screening for Volatile Organic Compounds

Soil samples collected during test pitting and drilling were field head space screened for the presence of Volatile Organic Compounds (VOCs) using a field portable photoionisation detector (PID). The PID calibration certificates are provided in **Appendix F**.

Results of PID field headspace screening of soil samples is provided in the bore hole logs located in **Appendix C**. PID readings indicated no evidence of VOC contamination in the soils sampled. All field headspace readings were 0.0 ppm.

5.3 Soil Analytical Results

Soil analytical results are presented in the summary **Tables 1 to 9** attached in **Appendix D**. Laboratory certificates and chain of custody documentation are provided in **Appendix E**.

5.3.1 Adopted Health Investigation Levels

Metals

Total metal concentrations were detected below the site adopted HILs for all soil samples submitted for analysis. A comparison of metals analytical soil results against site adopted HILs is presented in **Table 1 (Appendix D)**.

TRH

Results for TRH F1 (C₆-C₉), F2 (>C₁₀ – C₁₆), F3 (>C₁₆ – C₃₄), and F4 (>C₃₄ – C₄₀) petroleum hydrocarbons were below the limit of detection all the soil samples analysed with the exception of samples collected from test pits TP25 and TP28, located near to the Electrolytic Street site boundary. These results are summarised below:



- F3 (>C₁₆ – C₃₄): Samples TP25_0.0_0.1 (700 mg/kg) and TP28_0.0_0.1 (1,330 mg/kg).

In the absence of Australian health based investigation levels, the reported TRH detections at locations TP25_0.0_0.1 and TP28_0.0_0.1 were compared with the following Canadian investigation levels for petroleum hydrocarbons in coarse-grained surface soils for both the assessment of direct contact/ingestion and vapour inhalation exposure pathways for commercial and residential land use exposure scenarios.

Table 13: Canadian Investigation Levels for Petroleum Hydrocarbons in Coarse Grained Soils

Exposure Pathway	Land Use	TRH (C ₆ -C ₁₀)	TRH (>C ₁₀ -C ₁₆)	TRH (>C ₁₆ -C ₃₄)	TRH (>C ₃₄)
Direct Contact (Ingestion and Dermal Contact)	Residential	12,000 mg/kg	6,800 mg/kg	15,000 mg/kg	21,000
Direct Contact (Ingestion and Dermal Contact)	Commercial	19,000 mg/kg	10,000 mg/kg	23,000 mg/kg	RES
Vapour Inhalation (indoor)	Residential	40 mg/kg	190 mg/kg	N/A	N/A
Vapour Inhalation (indoor)	Commercial	320 mg/kg	1,700 mg/kg	N/A	N/A

Source: CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale Supporting Technical Document, dated January 2008.

N/A – not applicable

RES - Residual petroleum hydrocarbon formation. Calculated value exceeds 30,000 mg/kg and solubility limit for petroleum hydrocarbon fraction.

There were no reported exceedances of the adopted Canadian investigation levels provided in **Table 13**. A comparison of TRH (and BTEXN) analytical soil results with the adopted health screening levels is presented in **Table 2 (Appendix D)**.

BTEXN

Results for BTEXN were below the limit of detection for all the soil samples analysed with the exception of the sample collected from test pit TP28_0.0_0.1 (toluene 0.6 mg/kg and meta & para-xylene 0.5 mg/kg). These concentrations are at or only slightly greater than the limits of reporting. No health criteria are provided in the Canadian investigation levels for toluene and xylene.

PAH

Low concentrations (close to detect concentrations) of PAHs were detected for soil samples collected at sample locations TP10_0.0_0.1, TP25_0.0_0.1, TP28_0.0_0.1 and TP30_0.0_0.1. All PAH concentrations were well below the criteria.

A comparison of PAH soil analytical results with the adopted health-based investigation levels is presented in **Table 3 (Appendix D)**.

OCPs and Phenols

Results for OCPs and phenols were below the limit of detection for all the soil samples analysed.

A comparison of OCPs and phenols soil analytical results with adopted health-based investigation levels is presented in **Table 3 (Appendix D)**.

Nutrients

Results for nutrients were below the detection limit with the exception of Ammonia (1 sample), Total Kjeldahl Nitrogen (TKN) as N (5 samples), Total Nitrogen as N (5 samples) and Total Phosphorus as P (5 samples). No investigation levels were identified for nutrients. However, the following is noted:



- The concentrations of phosphorous are less than ecological investigations level of 2,000 mg/kg provided in the rescinded version of the NEPM (NEPC, 1999).
- The nitrogen in the soils is all in the form of TKN, an organic essentially insoluble form of nitrogen. The samples analysed for nitrogen were collected from (apparently) reworked natural soils at TP20 and TP26, and filled ground (including CWR and slag) near to a suspected for septic tank at BH4. The highest concentrations of TKN were reported in the reworked natural soils, and not in filled ground adjacent to a potential source of nitrogen (septic tank). On this basis, the concentrations of TKN are considered likely to represent natural conditions.

The nutrient soil analytical results are presented in **Table 5 (Appendix D)**.

5.3.2 Adopted Ecological Investigation Levels

Metals

Site specific EILs were calculated for the two types of soil found on site: fill/sand and natural/clay.

Fill/ Sand: In soil samples collected from the fill/ sand soil layer total metal concentrations were detected below the site adopted Ecological Investigation Levels (EILs) for all samples submitted for analysis, with the exception of arsenic (3 samples), copper (22 samples), and zinc (7 samples). These COPC were detected at concentrations above the respective, site adopted, EILs for either urban residential or commercial / industrial land use scenarios. These exceedances are summarised below:

- **Arsenic:** three soil samples had concentrations of arsenic above the EIL for commercial/industrial (160 mg/kg) and urban residential (100 mg/kg) land use, ranging from 166 mg/kg (TP20_0.5_0.6) to 209 mg/kg (TP25_0.9_1.0);
- **Copper:** twenty-one soil samples had concentrations of copper above the EIL for commercial/industrial land use (265 mg/kg) and urban residential land use (205 mg/kg), ranging from 287 mg/kg (TP4_0.0_0.1) to 2,740 mg/kg (TP6_0.2_0.3). One sample (262 mg/kg at TP27_0.0_0.1) also had a concentration of copper above the EIL for urban residential (205 mg/kg) land use, but below the commercial/industrial EIL; and
- **Zinc:** three soil samples had concentrations of zinc above the EIL for urban residential land use (310 mg/kg) and commercial/industrial (455 mg/kg) land use, ranging from 500 mg/kg (TP6_0.2_0.3) to 529 mg/kg (TP8_0.0_0.1). Four samples also had concentrations of zinc above the EIL for urban residential (310 mg/kg) land use, but below the commercial/industrial EIL. Zinc concentrations for these four samples ranged from 369 mg/kg (TP16A_0.2_0.3) to 415 mg/kg (TP30_0.0_0.1).

Natural/Clay: In soil samples collected from the natural/clay layer total metal analysis were detected below the site adopted EILs for all samples, with the exception of copper (3 samples) and zinc (2 samples). These exceedances are summarised below:

- **Copper:** soil concentrations detected above the EIL for commercial/industrial (355 mg/kg) and the EIL for urban residential (355 mg/kg) land use ranged from 436 mg/kg (TP27_0.0_0.1) to 717 mg/kg (TP27_0.5_0.6); and
- **Zinc:** soil concentrations detected above the EIL for commercial/industrial (435 mg/kg) and urban residential (655 mg/kg) land use, ranged from 798 mg/kg (TP27_0.5_0.6) to 1150 mg/kg (TP26_1.5_1.6).

A comparison of the metals analytical soil results with the adopted EILs is presented in **Table 9 (Appendix D)**.

TRH

Results for TRH F1 (C₆-C₉), F2 (>C₁₀ - C₁₆), F3 (>C₁₆ - C₃₄), and F4 (>C₃₄ - C₄₀) petroleum hydrocarbons were below the adopted ESLs for all the soil samples analysed with the exception of samples collected from



test pits TP25 and TP28, located near to the Electrolytic Street site boundary. These results are summarised below:

- F3 ($>C_{16} - C_{34}$): Samples TP25_0.0_0.1 (700 mg/kg) and TP28_0.0_0.1 (1,330 mg/kg) were above the ESL for urban residential land use of 300 mg/kg, but below the ESL for industrial/commercial land use of 1,700 mg/kg.

A comparison of TRH analytical soil results with the adopted ESLs is presented in **Table 8 (Appendix D)**.

BTEXN

Results for BTEXN were below the ESL for all the soil samples analysed. Sample TP28_0.0_0.1 contained detect concentrations of toluene (0.6 mg/kg) and meta-para xylenes (0.5 mg/kg), which were below the respective ESLs for both urban residential and industrial/commercial land use exposure scenarios for both COPC.

A comparison of BTEXN analytical soil results with the adopted ESLs is presented in **Table 8 (Appendix D)**.

5.3.3 Adopted Management Investigation Levels

TRH

Results for TRH F1 ($C_6 - C_9$), F2 ($>C_{10} - C_{16}$), F3 ($>C_{16} - C_{34}$), and F4 ($>C_{34} - C_{40}$) petroleum hydrocarbons were below the adopted Management Limits (MLs) for all the soil samples analysed.

A comparison of TRH analytical soil results against adopted management limits is presented in **Table 8 (Appendix D)**.

5.3.4 Adopted Asbestos Investigation Levels

Asbestos

Suspected asbestos containing materials were observed in test pits during soil sampling (TP12A, TP16A and TP16B). Ten primary soil samples were analysed for asbestos identification in bulk samples. Seven of these samples detected asbestos, within all containing chrysotile (white asbestos), five containing amosite (brown asbestos) and one containing crocidolite (blue asbestos). The seven samples with positive identification of asbestos containing materials were: TP10_0.0_0.1, TP11_0.1_0.2, TP12A_0.1_0.2, TP15_0.0_0.1, TP16A_0.9_1.0, TP16B_0.1_0.2 and TP20_0.5_0.6.

Asbestos quantification analysis was completed by ALS laboratory and results compared against the amended ASC NEPM (NEPC, 2013) health screening levels for the residential B and commercial/industrial D land use scenarios. All the samples analysed for asbestos were below the health screening level (0.001% weight for weight (w/w)) for asbestos fines and fibrous asbestos ($<7\mu\text{m}$). One sample (TP10_0.0_0.1), however, contained 0.10% w/w of non-friable asbestos, which is above the adopted health screening levels for the residential B (0.04% w/w) and commercial/industrial D (0.05% w/w) land use scenarios.

Comparison of the asbestos analytical results with the adopted health screening levels is presented in **Table 6 (Appendix D)**.

5.4 Groundwater Investigation Results

5.4.1 Groundwater Conditions and Flow

The depth to groundwater on 17 July 2013 ranged from 0.450 (D4) to 1.70 (D1) m below top of casing (btoc). Inferred groundwater flow based on previous investigations for the adjacent smelter and refinery (eg URS, 2007) suggests a northerly direction of groundwater movement.

No visual evidence of contamination (e.g. sheen) was observed during groundwater sampling.

Groundwater gauging results are presented in the attached **Table 10** and groundwater quality parameters are presented in the attached **Table 11 (Appendix D)**.



5.4.2 Groundwater Chemical Analytical Results

Groundwater analytical results are presented in **Table 12** included in **Appendix D**. Laboratory certificates and chain of custody sheets are included in **Appendix E**.

Groundwater samples were only able to be collected for analysis from the two existing (deep) wells on site (D1 and D4). The four new shallow wells were dry.

BTEX

Results for BTEX were reported below the respective laboratory limits of detection for both groundwater samples analysed.

TRH

Results for TRH were reported below the respective laboratory limits of detection for both groundwater samples analysed.

Metals

Results for selenium and mercury were reported below the respective laboratory limits of detection for both groundwater samples analysed. Concentrations of other metals analysed were above the respective limits of detection, but below the site adopted GILs, with the exception of the following:

Sample D1

- Reported a concentration of chromium at 0.003 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.001 mg/L;
- Reported a concentration of copper at 0.163 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.0014 mg/L and ANZECC (2000) marine 95% trigger value of 0.0013 mg/L;
- Reported a concentration of lead at 0.004 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.0034 mg/L; and
- Reported a concentration of zinc at 0.105 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.008 mg/L and ANZECC (2000) marine 95% trigger value of 0.015 mg/L.

Sample D4

- Reported a concentration of chromium at 0.003 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.001 mg/L;
- Reported a concentration of copper at 0.062 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.0014 mg/L and ANZECC (2000) marine 95% trigger value of 0.0013 mg/L;
- Reported a concentration of nickel at 0.015 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.0011 mg/L; and
- Reported a concentration of zinc at 0.055 mg/L, above the ANZECC (2000) freshwater 95% trigger value of 0.008 mg/L and ANZECC (2000) marine 95% trigger value of 0.0015 mg/L.

PAH, Phenols & OCPs

Results for PAHs, phenols and OCPs were reported below the respective laboratory limits of detection for both groundwater samples analysed.

Nutrients

Results for nutrients were above the detection limit with the exception of nitrite as N. For both samples concentrations of nitrate as N were below the site adopted investigation limit of 10x NHMRC (2011) ADWG.



Given the apparent absence of impacts in soil and the location of the site in a recharge zone, the concentrations of nutrients in groundwater are likely to represent ambient background groundwater quality.



6.0 QUALITY ASSURANCE AND QUALITY CONTROL

Analytical data validation is the process of assessing whether the data is in compliance with method requirements and project specifications. The primary objective of this process is to ensure that the data of known quality are reported and to identify if data can be used to fulfil the overall project objectives.

The data validation guidelines adopted are based upon the following data validation guidance documents published by the United States Environmental Protection Agency (USEPA) and the National Environment Protection Council (NEPC):

- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (EPA 540-R-10-011, dated January 2010);
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (EPA-540-R-08-01, dated June 2008); and
- NEPC (April 2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, EPHC 2013, Canberra

The process involves the checking of analytical procedure compliance and the assessment of the accuracy and precision of analytical data from a range of quality control measurements, generated from both field sampling and analytical programs.

The specific elements that have been checked and assessed for this project are detailed below and presented in detailed data validation summary sheets presented in **Appendix E**.

6.1 Quality Assurance (QA) Program

The quality assurance elements of the program included a review of:

- Preservation and storage of samples upon collection and during transport to the laboratory;
- Sample holding times;
- Use of appropriate analytical and field sampling procedures;
- Required limits of reporting;
- Frequency of conducting quality control measures; and
- The occurrence of apparently anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

6.2 Quality Control (QC) Program

The quality control elements of the program included a review of the results for:

- Laboratory blanks;
- Laboratory duplicates;
- Field duplicates;
- Field triplicates;
- Laboratory internal standards and calibration blanks;
- Matrix spike results;
- Surrogate recoveries; and



- The Relative Percent Difference (RPD) between duplicate quality control sample results.

6.3 Quality of Analytical Data Results

QC samples collected in the field during the investigation included:

- Three intra-laboratory duplicate soil samples;
- Three inter-laboratory duplicate soil samples;
- Three soil trip blanks (one per day for soil sampling);
- Four rinsate blanks (three collected during soil sampling, one collected during groundwater sampling).

In addition to field QC samples, the laboratory prepared and analysed the following QC samples with each laboratory batch:

- Laboratory duplicates;
- Laboratory blanks;
- Surrogate spikes;
- Matrix spikes; and
- Laboratory control samples.

6.4 Quality of Analytical Data Results

Analytical results for QC data are presented in **Tables 7a and 7b** for soil and **Table 13** for groundwater (**Appendix D**). Detailed laboratory QC data is presented in the analytical reports in **Appendix E**.

6.5 Data Validation Results

Accuracy and precision measurements from the appropriate QC check samples were compared with the analytical DQOs to assess the quality of the analytical data. The primary objective of the data validation process was to ensure that the data reported is suitable to be used to achieve the investigation objectives.

On the basis of the analytical data validation procedure employed, the overall quality of the soil and groundwater analytical data produced is considered to be of an acceptable standard for interpretative use. However, some of the outliers were:

Soil Batch (EW1301886)

- The laboratory duplicate (LD) relative percentage difference (RPD) for arsenic, zinc and total phosphorus as P in samples TP30_0.0-0.1_25/06/13 and TP26_0.5-0.6_25/06/13 exceed laboratory based limits. This is likely due to sample heterogeneity in soil samples. This is not expected to affect the validity of this batch.
- Outside laboratory limits RPD results were observed for total metals and sum of PAHs between the primary/duplicate samples TP25_0.0-0.1 and QC100 and primary/duplicate TP5_0.5-0.6/QC102 respectively. This may be due to the sample heterogeneity. The highest value was used for reporting purpose, as a conservative measure.
- Outside laboratory limits RPD results were observed for total metals and between the primary/triplicates samples TP25_0.0-0.1/QC200, TP8_0.0-0.1/QC201 and TP5_0.5-0.6/QC202 respectively. This may be due to different techniques used for the two laboratories and it is not expected to affect the quality data of this batch. As a conservative measure the highest value was used for reporting purpose.



Soil Batch (ES1322093)

- The LD relative percentage difference (RPD) for manganese in sample BH5-1.0-09/10/13 exceeds laboratory based limits. This is likely due to sample heterogeneity in soil samples. This is not expected to affect the validity of this batch.

Groundwater Batch (ES1316167)

- The matrix spike recovery for ammonia as N, nitrite plus nitrate as N (NO_x) and reactive silica were not determined due to background level greater than or equal to four times spike level.



7.0 DISCUSSION AND CONCLUSIONS

A DSI has been completed at the site with the principal objective of assess for the presence and extent (if any) of the soil and groundwater contamination resulting from historical activities which occurred at the site and surrounding properties. Golder understands the DSI was commissioned by PKC to support the proposed divestment for potential future mixed business and medium density residential land use.

Based on the scope of works completed at the site, the following conclusions are made:

Soil

- The investigation indicates the site is underlain by a generally thin layer of fill material, typically consisting of silty clay and sandy clay. Coal washery reject was reported to be present in approximately one-third of the locations, whilst asbestos was positively identified at seven locations, situated in the northern and central portions of the site.
- Natural soils typically comprising gravelly silty clay and clay underlie the fill, under which is volcanic bedrock generally encountered at approximately 1 mbgl.
- The concentrations of the chemicals of interest were not reported greater than the limits of reporting and/or health investigations levels adopted for the proposed mixed business and medium density residential land use. Nutrients reported at concentrations greater than the limit of reporting are considered to represent ambient background soil conditions.
- The concentrations of arsenic (3 samples), copper (22 samples) and zinc (7 samples) exceeded the adopted ecological investigation levels (EILs).
- The concentrations of total recoverable hydrocarbons (TRH) F3 ($>C_{16} - C_{34}$) in samples from test pits TP25 and TP28 located near to the Electrolytic Street were greater than the residential ecological screening levels (ESLs).
- Asbestos containing material was detected in samples collected from the test pits TP10, TP11, TP12A, TP15, TP16A, TP16B and TP20 – located in the central and northern portion of the site. Analysis indicated that one sample (TP10_0.0_0.1) had a concentration of non-friable asbestos above the investigation value for residential B (0.04%) and commercial/industrial D (0.05% w/w) land use scenarios.
- The presence of the chemicals of interest greater than the ecological assessment criteria, asbestos and general fill material may require future management in residential portions of the site (if redeveloped for this purpose), which could include on site retention (eg placement under road reserves/pavements) and management through the implementation of an environmental management plan (EMP).

Groundwater

- Shallow monitoring wells were installed near locations where water seepage was reported during soil investigations. However, groundwater did not accumulate in these wells and consequently were not sampled. This tends to suggest that any shallow groundwater under the site (including that observed by Golder (November 2012)) is likely to be perched, of limited extent, potentially ephemeral and therefore have limited potential uses.
- Groundwater levels in two deep (fractured rock) monitoring wells installed at the site ranged from 0.450 (D4) to 1.70 (D1) m below top of casing (btoc). Inferred groundwater flow based on groundwater level measurements and previous investigations is towards the north (URS, 2007). Since the site is located on a ridge and is likely to represent a recharge zone and groundwater divide, groundwater movement in other directions (including south towards Coomaditchy Lagoon) is also possible.
- The concentrations of the chemicals of interest were not reported greater than the limit of reporting or investigation levels, with the exception of:



- Copper and zinc, which are greater than the ANZECC (2000) marine ecosystems criteria.
- Chromium, copper, lead, nickel and zinc, which are greater than the ANZECC (2000) freshwater ecosystems criteria.

The concentrations of these chemicals of interest are likely to represent ambient background groundwater quality, given the industrial history of the region, the similarity in the concentrations of metals in soils on site and at background soil sample locations, and the location of the site in a recharge zone. On this basis, management of groundwater under the site is not considered to be required.



8.0 LIMITATIONS AND USE OF THIS REPORT

Your attention is drawn to the document "Limitations", which is included in **Appendix G** of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.



9.0 REFERENCES

AS 1726—1993, Geotechnical site investigations, Standards Australia.

Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture Resource Management Council of Australia and New Zealand (ARMCANZ) (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality;

CCME (2008a). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons (PHC) in Soil. Dated January 2008. Accessed on 10/10/2013. Accessed at: http://www.ccme.ca/assets/pdf/phc_standard_1.0_e.pdf;

CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons (PHC) in Soil: Scientific Rationale Supporting Technical Document. Dated January 2008. Accessed on 10/10/2013. Accessed at: http://www.ccme.ca/assets/pdf/pn_1399_phc_sr_std_1.2_e.pdf;

Department of Mineral Resources (1985). Geological Survey of N.S.W. *Wollongong – Port Hacking 1:100,000 Geological Series Sheet 9029-9129, Edition 1*;

Edwards, D.A., M.D. Androit, M.A. Amoroso, A.C. Tumme, C.J. Bevan, A. Tveit, L.A. Hayes, SIH. Yongren and D.V. Nakles. 1997. Development of Fraction Specific Reference Doses (RfDs) and Reference Concentrations (RfCs) for Total Petroleum Hydrocarbons (TPH). Volume 4 of the Total Petroleum Hydrocarbon Criteria Working Group Series, Amherst Scientific Publishers, Amherst, MA. 137 p;

Graeme Waller and Associates (August 1996). Environmental Lead Assessment Port Kembla Public School. Golder (2011). Port Kembla Smelter and Refinery Statutory Groundwater Monitoring July 2011;

Graham Brooks and Associates (February 2002) Heritage Assessment Port Kembla Public School February 2002;

Golder (2012). Former Port Kembla Primary School – Phase 1 Environmental Site Assessment;

Golder (2013). Sampling and Analytical Quality Plan – Former Port Kembla Primary School, Military Road, Port Kembla, NSW;

Mance G, Musselwhite C and Brown VM (1984). Proposed Environmental Quality Standards for List II Substances in Water. Arsenic. Technical Report TR 212, Water Research Centre, Medmenham, United Kingdom.

National Health and Medical Research Council (NRMHC) (2011). Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy;

National Health and Medical Research Council (NHMRC) (2008). Guidelines for Managing Risks in Recreational Water;

National Environment Protection Council (NEPC) (1999). National Environment Protection (Assessment of Site Contamination) Measure (NEPM);

NEPC (April 2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999*, EPHC 2013, Canberra;

NSW Department of Environmental and Climate Change (2009). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997;

NSW Environmental Protection Authority (EPA). Sampling Design Guidelines (1995);

NSW Office of Water (2011). Water Management (General) Regulation 2011, commencing 1 September 2011;

Port Kembla Copper (July 2002). Internal Memorandum Old Port Kembla Primary School Soil Assessment;



Port Kembla Copper (October 2000). Port Kembla Community Soil Monitoring Programme Post Establishment Soil Plot Report;

Soil Conservation Service of N.S.W. (1990) Soil Landscape Series 1:100,000 Sheet of Wollongong – Port Hacking 9029-9129.

URS (February 2006) Soil and Groundwater Investigation Port Kembla Copper Smelter Facility, Port Kembla NSW;

URS (November 2007) Groundwater Monitoring Port Kembla Copper May 2007 Round;

USEPA (2010). Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review. Reference: EPA 540-R-10-011, dated January 2010;

USEPA (2008). Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. Reference: EPA-540-R-08-01, dated June 2008, and;

WA DoH 2009a, Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia, Western Australian Department of Health and Western Australian Department of Environment and Conservation, Perth, Australia.

Wollongong City Council (7 June 2012) Planning Certificate (No. 201202446) – Issued under Section 149(2) and 149(5) of the Environmental Planning and Assessment Act 1979;

Zweep & Connolly (2002) Valuation and Acquisition Report on Commercial Development Property at Military Road Port Kembla 2505.



Report Signature Page

CAROLINA OLMOS

Carolina Olmos
Environmental Engineer

Graeme Miller

Graeme Miller
Principal Scientist

CO/GM/co

A.B.N. 64 006 107 857

\\syd1-s-file02\jobs\env\2013\137623028_pkcphase ii primary schoolport kembla, nsw\correspondence out\003_dsi report_primary school\final report\137623028-003-r-rev0_dsi_pkc primary school.docx



FIGURES



PHASE II - ENVIRONMENTAL
SITE ASSESSMENT - FORMER
PORT KEMBLA PRIMARY SCHOOL

PORT KEMBLA COPPER PTY LTD

SITE LOCATION

COPYRIGHT
Base map data copyright MapInfo Australia Pty Ltd



LEGEND

Site Location

0 50 100 200 300 400 500 metres

SCALE (at A4) 1:15,000
Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 137623028
DATE: 19/11/2013
DRAWN: FA
CHECKED: CO

FIGURE 1





PHASE II - ENVIRONMENTAL SITE
ASSESSMENT - FORMER PORT
KEMBLA PRIMARY SCHOOL

PORT KEMBLA COPPER PTY LTD

TEST PIT AND GROUNDWATER
MONITORING WELL LOCATIONS



LEGEND

- Test Pit Locations
- Borehole Location
- Offsite Locations
- New Shallow Monitoring Wells
- Existing Monitoring Wells
- Site Location
- Cadastre

COPYRIGHT

- Imagery Copyright - Service Layer Credits: © 2010 DigitalGlobe
© 2010 GeoEye © 2013 Microsoft Corporation
- Base map data copyright MapInfo Australia Pty Ltd
- Digital Cadastre Database, NSW Department of Lands, 2004

0 10 20 40 60 80 metres

SCALE (at A3) 1:1,500

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 137623028
DATE: 5/11/2013
DRAWN: FA
CHECKED: CO

FIGURE 2



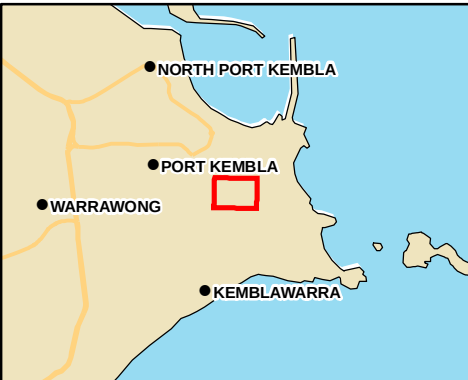
Information contained on this drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty Ltd.



PHASE II - ENVIRONMENTAL SITE
ASSESSMENT - FORMER PORT
KEMBLA PRIMARY SCHOOL

PORT KEMBLA COPPER PTY LTD

LOCATIONS WITH
ASBESTOS DETECTED



LEGEND

- Test Pit Locations
- Borehole Location
- ▲ Offsite Locations
- New Shallow Monitoring Wells
- ✕ Existing Monitoring Wells
- Site Location
- Cadastre

NOTE

Total metal concentrations expressed in mg/kg.

COPYRIGHT

1. Imagery Copyright - Service Layer Credits: © 2010 DigitalGlobe
© 2010 GeoEye © 2013 Microsoft Corporation
2. Base map data copyright MapInfo Australia Pty Ltd
3. Digital Cadastre Database, NSW Department of Lands, 2004



SCALE (at A3) 1:1,500

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 137623028
DATE: 10/12/2013
DRAWN: FA
CHECKED: OB

FIGURE 3



© 2012 DigitalGlobe © 2012 GeoEye State of Michigan



APPENDIX A

Sampling & Analytical Quality Plan



20 June 2013

SAMPLING AND ANALYTICAL QUALITY PLAN

Former Port Kembla Primary School, Military Road, Port Kembla, NSW

Submitted to:
Port Kembla Copper Pty Ltd
Military Road
PORT KEMBLA NSW 2505

REPORT



Report Number. 137623028_001_RevA

Distribution:

1 copy - Port Kembla Copper Pty Ltd
1 copy - Environment Protection Authority
1 copy - Golder Associates Pty Ltd





Table of Contents

1.0 INTRODUCTION.....	1
2.0 SITE INFORMATION.....	1
2.1 Site Location.....	1
2.2 Surrounding Land Use.....	1
2.3 Site History	2
2.4 Topography	2
2.5 Geology and Hydrogeology	2
2.6 Previous Investigations.....	3
2.5 Potential Areas and Chemicals of Interest.....	5
3.0 DATA QUALITY OBJECTIVES, ASSURANCE & QUALITY CONTROL	6
3.1 State the Problem	6
3.2 Identify the Decisions.....	6
3.3 Identify Inputs to the Decision.....	7
3.4 Define the Study Boundaries	7
3.5 Develop a Decision Rule	7
3.6 Specify Limits of Decision Errors	7
3.7 Optimise Design for Obtaining Data	9
4.0 SAMPLING PROGRAM.....	9
4.1 Potential Contamination Sources.....	9
4.2 Soil Sampling Density and Scope.....	10
4.3 Groundwater Sampling Density and Scope	11
5.0 QUALITY ASSURANCE AND QUALITY CONTROL.....	13
5.1 Data Validation Assessment.....	13
5.2 Laboratory Testing Protocols.....	14
5.3 Data Quality Objectives for Sample Analysis.....	14
6.0 ADOPTED SITE ASSESSMENT GUIDELINES	14
6.1 Soil Investigation Levels	14
6.1.1 Health Based Guidelines.....	14
6.1.2 Health Screening Levels (Asbestos)	15
6.1.3 Ecological Based Guidelines.....	15



6.1.4	Management limits	15
6.2	Groundwater Investigation Levels.....	16
6.2.1	Human Health Based Assessment.....	16
6.2.1.1	Perched Water	16
6.2.2	Ecological Based Assessment Criteria – Perched and Deep Groundwater	16
7.0	REFERENCES.....	17

TABLES

Table 1: Summary of Sites Details.....	1
Table 2: Geological and Hydrogeological Information	2
Table 3: Potential Areas and Chemicals of Interest	5
Table 4: Soil sampling Density and Scope	10
Table 5: Groundwater sampling Density and Scope	11
Table 6: Monitoring Well Locations.	12
Table 7: Frequency of Quality Control Samples and Acceptance Criteria.....	13
Table 8::Rationale for Assessing Soil Analytical Results using Soil HSLs for Vapour Intrusion.....	15

FIGURES

Figure 1 – Site Layout

Figure 2 – Proposed sampling locations.



1.0 INTRODUCTION

Golder Associates Pty Ltd (Golder) has prepared this sampling and analysis quality plan (SAQP) for a detailed site investigation (DSI) at the former Port Kembla Primary School, located on Military Road, Port Kembla, NSW (the site). The location and layout of the site is shown on Figure 1 (attached).

Golder understands the purpose of the DSI is to characterise the condition of the site to support divestment for potential future mixed business and residential use.

The SAQP defines the field works to be carried out at the site and presents specific quality assurance and quality control details to be employed during the DSI.

The background information provided in the following sections of the SAQP is taken from the Phase 1 Environmental Site Assessment (ESA) (Golder, 2012) conducted for the property.

2.0 SITE INFORMATION

2.1 Site Location

The location of the Site is shown in Figure 1. Table 1 presents a summary of the Site identification details.

Table 1: Summary of Sites Details

Site Name	Former Port Kembla Primary School
Street Address	Military Road
City, State, Postal Code	Port Kembla, NSW, 2505
Country	Australia
Legal Description	Lot 1 in Deposited Plan 811699 at Port Kembla, Local Government Area Wollongong, Parish of Wollongong, County of Camden.
Ownership	Port Kembla Copper Pty Ltd
Zoning	B4 – Mixed Use
Land Area	2.19 hectares

The Site is approximately trapezoidal in shape and covered with grass in the south eastern and north western portions. The central portion of the Site (surrounding the partially demolished remaining school building) is paved with concrete. Bitumen basketball and netball courts are located immediately to the north, north west and north east of the former building.

2.2 Surrounding Land Use

The main land uses surrounding the Site are summarised below:

- North: Electrolytic Street, beyond which is the former PKC smelter and refinery and other heavy industrial sites.
- North east: Reservoir Street, beyond which is MM Kembla Pty Ltd (heavy industry).
- East: Marne Street, beyond which is residential land.
- South: Military Road, beyond which is residential land.
- West: Military Road, beyond which is residential and commercial/light industrial land. A BP petrol station is located approximately 100 m west of the Site.

The Site is approximately 900 m south of Port Kembla Outer Harbour, 750 m northeast of Coomaditchy Lagoon and 700 m west of the Tasman Sea.



2.3 Site History

The current Certificate of Title indicates the Site is owned by Port Kembla Copper Pty Ltd. The Site was used as a primary school from 1916 until 2002.

A review of aerial photographs indicates the land use surrounding the Site has remained relatively constant since 1951, consisting of:

- North and north east – heavy industry.
- East and south – residential.
- West and north-west – residential and commercial.

Historical quarrying and filling appears to have occurred approximately 200 m east of the Site.

2.4 Topography

The building which remains on Site (see Figure 2) is located on the crest of a hill, with the ground surface sloping down from the building in every direction. The steepest slopes are towards the north and south east. The topographic map (10m contour interval) of the area indicates that the elevation of the Site ranges from 20m AHD at the northern tip of the Site to 30m AHD in the southern portion of the Site. The topographic map indicates that the Site exists on the northern end of a ridgeline that runs from the north-west to south-east.

Retaining structures/embankments border the Site along Electrolytic Street and Reservoir Street. The Site is approximately 3m higher than Electrolytic Street in the north and approximately 1.8m higher near the intersection of Electrolytic and Reservoir Streets. The Site is approximately 2 m higher than the adjacent ground level along Marne Street.

2.5 Geology and Hydrogeology

Geological and hydrogeological information for the Site and/or surrounding area (250 m) is summarised in Table 4.

Table 2: Geological and Hydrogeological Information

Geology	The Geological Survey of N.S.W. Department of Mineral Resources Geological Series 1:100,000 Sheet of Wollongong – Port Hacking 9029-9129 maps the geology underlying the Site as the Dapto Latite, described as melanocratic, coarse grained and porphyritic Latite. URS (February 2006) intersected the Dapto Latite under the Site at depths ranging from 4.4 mbgl (monitoring well D1) to 5.2 mbgl (monitoring well D4). Weathered Dapto Latite was observed to crop out in several areas surrounding the school, including: ■ Adjacent to Military Road (near the school building) ■ At the intersection of Marne Street and Military Road (in the grass verge next to the foot path) ■ Near the intersection of Reservoir Street and Marne Street (in the grass verge next to the foot path) and ■ Near the intersection of Electrolytic Street and Military Road (near the western corner of the Site). The materials overlying bedrock were reported by URS (February 2006) as fill or possible fill to between 0.8 mbgl (metres below ground level) in



	monitoring well D1 and 0.5mbgl in monitoring well D4, overlying natural clay and silt soils. According to Graeme Waller and Associates (August, 1996), possible slag and coal washery reject (CWR) were present in the western corner of the site. Also, slag and CWR were observed during the Site walkover on 8 June 2012, at the ground surface in the northern and western portions of the site. (Golder, 2012)
Approximate Depth to Groundwater	Two groundwater monitoring wells (D1 and D4 - see Figure 2) exist at the Site, forming part of the groundwater monitoring network for the adjacent PKC smelter and refinery. During the July 2011 monitoring round the water level in these wells were 3.80 mbgl (D1) and 5.90 mbgl (D4) (Golder 2011). Groundwater elevations at these wells were 29.67 mAHD (D1) and 25.51 mAHD (D4). Both of the wells are installed in bedrock, were identified during the Site walkover on 8 June 2012, and appear to be intact.
Inferred Groundwater Flow Direction	The Site is located at the crest of a hill and is likely to form a local recharge area and groundwater divide. Groundwater in the Dapto Latite is known to move north towards Port Kembla Harbour (Golder, 2011) and may also move southwest toward Coomaditchy Lagoon. Possible perched groundwater appears to be moving north towards Electrolytic Street, based on observed seeps from the retaining wall along this boundary.

2.6 Previous Investigations

Seven reports obtained from PKC provided information on the condition of the Site – in particular the potential for contamination at the Site. A summary of the scope of works and outcomes of these investigations are presented in the following sections.

Graeme Waller & Associates (August 1996) Environmental lead Assessment Port Kembla Public School.

Graeme Waller and Associates conducted an assessment of lead in the surficial soils of the Port Kembla Public School. The report was submitted to the NSW Department of School Education. The report identified potential sources of lead impacts as airborne particulate fallout from both motor vehicle emissions and industrial sources, and from lead based paints.

Many of the soil samples collected across the Site were described as containing fused black material (possible slag), black grit, and black shale (possible coal washery reject). The samples with the highest concentrations of lead generally coincided with the presence of these materials in the soil.

Port Kembla Copper (October 2000) Port Kembla Community Soil Monitoring Programme Post Establishment Soil Plot Report.

PKC undertook an investigation into the long term impacts of lead emissions from the smelting and refining operations on soil quality with the Port Kembla area. The investigation included establishment of 12 soil monitoring plots of imported virgin excavated natural material (VENM) soil of known chemical composition that were capped with turf. This report outlines the initial placement of the soil plots (one of which is situated within the Site) and the initial baseline analysis of the soil. The results of subsequent sampling (if conducted) were not able to be located in PKC's archives.

Graham Brooks and Associates (February 2002) Heritage Assessment Port Kembla Public School February 2002.

Graham Brooks and Associates prepared a heritage assessment for PKC prior to their purchase of the Site. The assessment outlined the historical context of the former Port Kembla Primary School and provided an



assessment of heritage significance of the Site and buildings present on the Site. The assessment identified that the first school building was constructed in 1916 (after the Electrolytic Refining and Smelting (ER&S) company began operations in Port Kembla in 1907 (Wollongong Council Website)). An extension to the northern portion of this was indicated to have occurred in 1931. Construction of the former infants school building commenced in 1952, with the building being opened in 1953. A description is provided of the 1916 building as being “covered with an asbestos slate roof” and two sheds that existed along the Electrolytic Street and Reservoir Street boundaries are identified as having corrugated asbestos roofing.

Port Kembla Copper (July 2002) Internal Memorandum Old Port Kembla Primary School Soil Assessment.

PKC undertook a soil assessment at the Site in June 2002, with samples collected from six areas of the Site. The samples were collected from 0-50 mm and 100-150 mm below ground level at five locations within each of the six areas (total of 60 samples). The samples were analysed for arsenic, cadmium, chromium, copper, nickel, lead and zinc.

The results of analysis are summarised as follows:

- Arsenic results were less than NEPM¹ HIL²-A, HIL-D, HIL-E and HIL-F. Four sample results exceeded EIL³ criteria.
- Cadmium results were less than HIL-A, HIL-D, HIL-E and HIL-F. Nine sample results exceed EIL criteria.
- Chromium results were less than HIL-A, HIL-D, HIL-E and HIL-F and EIL criteria.
- Nickel results were less than HIL-A, HIL-D, HIL-E and HIL-F and EIL criteria.
- Zinc results were less than HIL-A, HIL-D, HIL-E and HIL-F. 18 sample results exceed EIL limits.
- Copper:
 - 17 results exceeding HIL-A,
 - one results exceeding HIL-D,
 - five results exceeding HIL-E,
 - No results exceeding HIL-F, and
 - 55 sample results exceed EIL criteria.
- Lead:
 - 10 results exceeding HIL-A,
 - No results exceeding HIL-D,
 - 2 results exceeding HIL-E,
 - No results exceeding HIL-F, and
 - 2 sample results exceed EIL criteria.

Notes: ¹ NEPM classification as previous NEPM 1999.

² HIL - Health Investigation Level

³ EIL - Ecological Investigation Level



Zweep & Connolly (2002) Valuation and Acquisition Report on Commercial Development Property at Military Road Port Kembla 2505.

Zweep & Connolly prepared a valuation report for the Site in 2002. The report identified potential impacts at the Site related to filling and fallout from the adjacent PKC copper smelter.

URS (February 2006) Soil and Groundwater Investigation Port Kembla Copper Smelter Facility, Port Kembla NSW.

URS was engaged by PKC to undertake a soil and groundwater investigation of the PKC smelter and refinery. These works were commissioned in response to the Site being declared as presenting a potential significant risk of harm by the NSW Department of Environment and Conservation (DEC) on 13 February 2004. The chemicals of interest identified in the declaration were arsenic, cadmium copper lead manganese sulfate and zinc and groundwater acidity.

Two monitoring wells (D1 and D4) were installed within the former Port Kembla Primary School (refer to Figure 2) as part of the URS investigation. These wells were installed to assess (background) groundwater quality upgradient of the PKC smelter and refinery.

Soil samples collected during installation of the two monitoring wells at the Site (D1 (1-1.5m and 4.2-8m) and D4 (1.5-2m and 5.4-8m)) each had concentrations of copper greater than the EIL criteria, and sample D4 5.4-8 exceeded the HIL-A copper criteria, but was less than HIL- D, HIL-E and HIL-F. The concentrations of other metals in the samples collected from D1 and D4 were less than the HIL and EIL criteria.

Groundwater sampled from monitoring well D4 did not have concentrations of the chemicals of interest greater than the ANZECC 2000 marine 95% trigger values, with the exception of copper (0.01 mg/L) and zinc (0.024 mg/L). Well D1 was dry and was not sampled.

URS (November 2007) Groundwater Monitoring Port Kembla Copper May 2007 Round.

URS was engaged by PKC to conduct a round of groundwater monitoring at all accessible monitoring wells located on and surrounding the PKC smelter and refinery. The chemicals of interest in groundwater were identified as arsenic, cadmium, copper, lead, manganese, nickel, and zinc.

Groundwater samples were collected from monitoring wells D1 and D4 during this round of monitoring. The concentrations of the chemicals of interest were less than the ANZECC 2000 marine 95% trigger values, with the exception of the following:

- Monitoring well D1 - copper (0.03 mg/L) and zinc (0.032 mg/L)
- Monitoring well D4 - copper (0.117 mg/L), nickel (0.09 mg/L) and zinc (0.078 mg/L).

2.5 Potential Areas and Chemicals of Interest

Table 3 below presents a summary of the potential areas of interest and respective chemicals of interest obtained from the Phase 1 ESA (Golder, 2012).

Table 3: Potential Areas and Chemicals of Interest

Key Areas of Interest	Chemicals of Interest
Areas Filled with slag and CWR (predominantly northern and western portions, but may be under large areas of the Site)	Metals, Combustion Ammonia
Asbestos cement fragments (Observed on concrete hard stand south of building)	Asbestos



Key Areas of Interest	Chemicals of Interest
Surficial soil impacts from historical fallout of airborne deposits from nearby industrial activities	Metals
Lead Paint residue - in soil surrounding (demolished and remaining buildings)	Lead
Mounded/stockpiled soil of unknown composition	Unknown, but may include metals, ammonia, general waste and combustion hazard
Areas of demolished buildings/demolition works	Asbestos, Lead
Seepage water in northern portion of Site near Electrolytic Street	Metals and ammonia
Septic tank	Nutrients, metals, organic compounds
Off-Site	
Petrol Station on Church Street	TPH, BTEX, PAH, Lead
Former quarry 200m East of the Site	Unknown
Port Kembla Copper	Metals

Key:

Metals - arsenic, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium & zinc

It is noted that since the Site is located on the crest of a hill and forms a high point compared to the surrounding land, contaminants associated with surrounding properties are considered unlikely to impact upon soil, groundwater or surface water quality at the Site.

3.0 DATA QUALITY OBJECTIVES, ASSURANCE & QUALITY CONTROL

The Data Quality Objectives (DQOs) process is used to define the type, quantity and quality of data needed to support decisions relating to the environmental condition of a site. Application of the seven-step DQO/DQI planning approach (provided in Appendix IV of Guidelines for the NSW Site Auditor Scheme (NSW DECC 2006)) to the former Port Kembla Primary School assessment is outlined below.

3.1 State the Problem

The former Port Kembla Primary School has been historically used as a school from 1916 until 2002, when it was purchased by PKC. As a result of filling and activities undertaken adjacent to the property (heavy industrial and residential land), the site may have been contaminated. Detail on potential areas and types of contamination are provided in **Section 2.5**.

3.2 Identify the Decisions

Assessment of the site is to focus on potential human health and environmental risks associated with potential contamination. The decisions that need to be made on the contamination status of the site include:

- Whether contamination exists in soils or groundwater at the site that would preclude a range of land uses and pose a risk to identified receptors; and
- If such contamination is encountered through the characterisation assessment proposed, assess feasible management options.

The site will be considered not to pose a risk if analytical results for the media sampled and analysed are less than the adopted site criteria, or are determined by a site specific risk assessment not to represent an



unacceptable risk. Where an unacceptable risk is indicated by the DSI results, management options will need to be considered to allow future beneficial use of the site.

3.3 Identify Inputs to the Decision

The primary inputs to assessing the presence of contamination in soil and groundwater will be as follows:

- Assessment of the areas of potential contamination derived from information gathered during the Phase 1 ESA;
- Use of field investigation techniques to assess areas of contamination including the collection of soil and groundwater samples for field assessment and off-site laboratory analysis;
- Assessment of the field measurement/observation (e.g. field screening with portable photo ionisation detector (PID) and field measurement of water quality parameters) and laboratory analytical results.
- Assessment of the suitability of the data for the purposes of environmental assessment through application of data quality indicators (DQIs);
- Assessment of health and environmental risk based on analysis of soil and groundwater samples for potential contaminants and comparison of the concentrations of these contaminants with the adopted assessment criteria ; and
- If management/remediation is warranted, the response needs to be assessed as technically feasible, environmentally justifiable and consistent with relevant laws, policies and guidelines.

3.4 Define the Study Boundaries

The study boundaries are defined as follows.

- The lateral extent of the Investigation Area is shown in **Figures 1 and 2**.
- Depth of potential contamination is considered likely to be limited to the shallow soil profile (<4m depth) and the inferred depth to groundwater (based on local geology, site topography and surface water features identified in the area) approximately 1.5-2 mbgl; and
- Environmental matrix being assessed - soil and groundwater.

3.5 Develop a Decision Rule

The soil and groundwater analytical data generated shall be compared with the adopted assessment guidelines (**Section 6**) and against background concentrations, where available and relevant.

The soil and groundwater analytical QA/QC data shall be compared against the adopted acceptance criteria (**Section 5.1**) and may need to be disregarded should the data not meet the adopted acceptance criteria.

Following the initial assessment, Golder would advise PKC if conditions potentially constituting Significant Risk of Harm under the CLM Act (1997) were encountered.

3.6 Specify Limits of Decision Errors

Data Quality Indicators are developed based on the following parameters:

- P - Precision: A quantitative measure of the variability (or reproducibility) of data;
- A - Accuracy: A quantitative measure of the closeness of reported data to the “true” value;
- R - Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on site;



- C - Completeness: A measure of the amount of useable data from a data collection activity; and
- C - Comparability: The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

The measures/criteria employed to enable review of these parameters are described below and detailed in (Section 5).

Precision

Field precision will be monitored through the use of Golder's standard procedures (SOPs) and ensuring that these are complied with throughout the sampling event(s). Suitable criteria and/or performance indicators for assessment of laboratory precision include performance of intra-laboratory and inter-laboratory duplicate sample sets through calculation of relative percentage differences (RPD).

Accuracy (Bias)

Accuracy in the field activities will be monitored through the use of SOPs and ensuring that these are complied with throughout the sampling event(s). The closeness of the reported data to the "true" value is assessed through review of performance of:

- Method blanks, which are analysed for the analytes targeted in the primary samples;
- Matrix spike sample sets; and
- Laboratory control samples.

Representativeness

To ensure representativeness of the field conditions, appropriate media will be sampled as identified in this SAQP.

To ensure the data produced by the laboratory is representative of conditions encountered in the field, the following steps will be taken:

- Blank samples will be analysed at the laboratory in parallel with field samples to confirm there are no unacceptable instances of laboratory artefacts;
- Review of relative percentage differences (RPD) values for field and laboratory duplicates to provide an indication that the samples are generally homogeneous, with no unacceptable instances of significant sample matrix heterogeneities; and
- The appropriateness of collection methodologies, handling, storage and preservation techniques will be assessed to ensure/confirm there was minimal opportunity for sample interference or degradation (i.e. volatile loss during transport due to incorrect preservation/transport methods/sampling technique for example).

Completeness

In assessing the completeness of the field data the following is considered:

- All critical locations sampled;
- Representative samples collected; and
- An appropriately experienced sampling team is engaged in the investigation program.

In validating the degree of completeness of the analytical data sets acquired during the program the following is considered:

- Whether SOPs for sampling protocols have been adhered to; and



- Copies of all project chain of custody (COC) documentation are reviewed and presented.

Comparability

In the event that the reported data sets are comprised of results from separate sampling events (eg groundwater), issues of comparability between data sets are reduced through adherence to the same SOPs on each data gathering activity.

In addition the data will be collected by experienced samplers and NATA accredited laboratory methodologies will be employed in all laboratories.

3.7 Optimise Design for Obtaining Data

Sample locations have been selected based on the observed site conditions and site history.

Sampling will target the areas of potential contamination (e.g. septic tank, areas filled with slag and coal washery reject (CWR), mounded stockpiles etc.), coupled with broader sampling across the site.

The test pitting sampling will primarily be grid-based (30 m x 30 m) shallow sampling of soil to provide overall site characterisation data. A total of 24 test pit locations will be investigated. Six (6) boreholes locations will be drilled in the central portion of the site (surrounding the remaining building and septic tank) which is paved with concrete. Four shallow groundwater monitoring wells will also be installed.

Two background soil samples will be collected from nearby vacant residential lots for the purpose of measuring ambient background concentrations (ABC) to allow calculation of ecological investigation levels (EILs).

4.0 SAMPLING PROGRAM

4.1 Potential Contamination Sources

Based on the information collated and observations made as part of the Phase 1 ESA Site inspection, the targeted locations are presented in section 2.5 and include the following:

- Areas filled with slag and CWR, predominantly northern and western portions of the Site;
- Asbestos cement fragments (Observed on concrete hard stand south of building);
- Surficial soil impacts from historical fallout of airborne deposits from nearby industrial activities;
- Lead Paint residue - in soil surrounding (demolished and remaining buildings);
- Mounded/stockpiled soil of unknown composition;
- Areas of demolished buildings/demolition works (main building),
- Seepage water in northern portion of Site near Electrolytic Street, and;
- Septic tank.



4.2 Soil Sampling Density and Scope

The proposed investigation program is outlined below in Table 4. Proposed sample locations are shown in Figure 2.

Table 4: Soil sampling Density and Scope

Activity	Details
Service Location	"Dial Before You Dig" underground utility location service is engaged to identify underground services prior to any intrusive work commencing.
Number of Sampling investigation points	30 sampling points on site are considered. 24 test pitting and 6 boreholes (4 of the boreholes will be converted into monitoring wells). 2 background sample locations will be collected from a nearby park.
Test Pitting	A total of twenty-four test pit locations will be investigated using a backhoe or small excavator on site. The test pits will continue to a minimum of 30 cm into the natural soil profile is intersected. The locations and elevations of the test pits will be recorded using a GPS.
Soil Bores Clearance	A total of six boreholes will be drilled on site. All boreholes will be cleared using hand auger to a depth of 1.2 metres mbgl and be drilled to a minimum 30 cm into the natural soil profile. The locations and elevations of the soil bores will be recorded using a GPS.
Soil Bores Drilled and Target Depth	The six boreholes will be advanced to 2 m beyond the initial water strike, which is expected at 1.5 – 2 mbgl, based on the information obtained during the Phase 1 searches (including site topography, local geology and local hydrology).
Drilling Technique	Boreholes will be drilled using a truck mounted drill rig with solid stem augers. Push tubing will be used first to collect the soil samples.
Soil Sampling	Samples will be collected at the surface (directly below ground surface level) and at approximately 0.5 m intervals thereafter and/or where evidence of contamination is noted through field observations. Based upon field observations and PID screening, up to two samples per location will be nominated for laboratory analysis. This will include samples of natural soils underlying the filled soil profile. Ten litre soil samples will be collected from locations and profiles suspected to contain asbestos.
Decontamination	Soil sampling equipment is to be decontaminated between each sampling event using a contaminant-free detergent (Decon 90 or equivalent), followed by a rinse by potable water between each location. All drilling equipment is to be decontaminated prior to and on completion of each sampling location. The drilling rig will also be decontaminated on completion of the works.
Field Records	All boreholes will be logged in accordance with AS1726-1993 and the United Soil Classification System (USCS). Odours will be recorded by the Golder site supervisor during the collection of soil samples. The sample descriptions, sample numbers, results of all field measurements, will be recorded in the field logs and provided as an appendix to the DSI report.
Sample Preservation	Samples will be placed in tightly packed laboratory supplied containers to minimise headspace. Soil samples will be clearly labelled with unique sample identification numbers and stored in a chilled cooler box prior to dispatch to a



Activity	Details
	NATA accredited laboratory, accredited for the selected analysis, under chain-of-custody (COC) procedures.
Disposal of Soil Cuttings	Sampling location will be backfilled with the soil cuttings where possible, however the soil cuttings from drilling will be drummed on site in 205 L drums and will be disposed of by PKC (in accordance with NSW EPA requirements).
Sample Analysis	Samples will be tracked in the field and laboratory using COCs. Samples will be analysed for the following analytes: - Metals (10 metals*): Up to 2 primary samples per location - TRH / BTEX / PAH/ Phenols / OCPs: 1 primary sample per location - Ammonia as N**: 1 primary sample per location - Total N +TKN+NO₂+NO₃+NH₃+Total Phosphorus** (4 location around the Septic Tank Area): Up to 2 primary samples per location - Asbestos (concrete hard stand south of building and demolished building areas and demolition fill): Up to 8 primary samples. 15 samples of natural soil materials collected from the site will be analysed for pH, cation exchange capacity and particle size distribution.
Quality Control (QC) samples	Three field duplicates and three field triplicates will be taken for the soil sampling program. QC samples will be analysed for the same analytes as the primary samples. Also, four rinsate blanks and four trip blanks will be taken (assuming a 4 day sampling program). Rinsate blank will be analysed for metals, TRH / BTEX / PAH/ Phenols / OCPs. Trip blank will be analysed for TRH C₆-C₁₀ and BTEXN.

Notes:

*Arsenic, cadmium, chromium, copper, lead, nickel, manganese, selenium, zinc and mercury.

BTEX: Benzene, Toluene, Ethylbenzene and Xylene.

TRHs: Total Recoverable Hydrocarbons

PAHs: Polycyclic Aromatic Hydrocarbons

OCPs: Organochlorine (OC) and Organophosphorous (OP) Pesticides

** Nutrients

If impacts are identified through the vertical delineation of the soil, additional analysis will only be scheduled following approval from PKC.

4.3 Groundwater Sampling Density and Scope

The proposed investigation program is outlined below in Table 5. Proposed sample locations are shown in Figure 2.

Table 5: Groundwater sampling Density and Scope

Activity	Details
Well Construction	Four monitoring wells will be constructed using 50 mm diameter Class 18 uPVC with machine slotted (0.4 mm) screen surrounded by a gravel pack across the targeted groundwater table. The gravel pack will be placed from the base of the borehole to 0.5 m above the well screen. A bentonite grout seal (approximately 0.5 m thick) will be placed above the screen/gravel pack. The bentonite will be hydrated to promote sealing. Wells will be fitted with lockable caps and a steel gatic cover finished at ground level.



Activity	Details
Well Development	Upon completion, each well will be developed by air lifting to remove fluids introduced during drilling.
Well Gauging, Purging and Sampling	Groundwater sampling is proposed one week after well development, using dedicated sampling equipment to avoid cross-contamination. Monitoring wells will be gauged pre-purging using an oil / water interface probe. The
Decontamination	Decontamination would not be required for groundwater purge and sample equipment as all this equipment is dedicated. The oil / water interface probe will be decontaminated using Decon 90 solution and rinsed by potable and deionised water between each location.
Sample Preservation	Samples will be placed in laboratory supplied bottles containing the appropriate preservatives. Samples stored in an ice chilled cooler-box whilst on site and in transit to the laboratory. Samples collected for metal analysis will be filtered in the field.
Disposal of Purged Groundwater	Development water, purge water and decontamination fluids will be drummed on site in 205 L drums and will be disposed of by PKC in accordance with NSW EPA requirements.
Well Survey	The newly installed wells will be surveyed to metres Australian Height Datum (mAHD) as well as the easting and northing coordinate locations (AMG). The survey will be commissioned by PKC.
Sample Analysis	Samples will be tracked in the field and laboratory using COCs. Samples will be analysed for the following analytes: - Metals (10 metals*): 6 primary samples - TRH / BTEX / PAH/ Phenols / OCPs: 6 primary samples - Ammonia as N, Total N +TKN+NO2+NO3+NH3+Total Phosphorus** : 6 primary samples
Quality Control (QC) Samples	One field duplicate, one field triplicate will be taken for the groundwater sampling program. QC samples will be analysed for the same analytes as the primary samples. Also, one rinsate blank and one trip blank will be taken (assuming a 1 day sampling program). Rinsate blank will be analysed for metals, TRH / BTEX / PAH/ Phenols / OCPs. Trip blank will be analysed for TRH C6-C10 and BTEXN.

Monitoring well locations were chosen according to:

Table 6: Monitoring Well Locations.

Area/Source	Proposed Investigation Strategy	Monitoring Well Location
Filled ground	To be based on observations from soil sampling program	PS_MW1 PS_MW2 PS_MW3
Septic Tank - Potential for leakage or overflow from septic tank.	One groundwater monitoring wells in the vicinity of the septic tank.	PS_MW4



5.0 QUALITY ASSURANCE AND QUALITY CONTROL

5.1 Data Validation Assessment

The assessment of the quality of the analytical data will be undertaken in accordance with guidance provided in the following:

- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, (EPA 540/R-94/013, February 2002);
- USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, (EPA 540/R-99/008, October 1999)
- NEPC, 1999 National Environmental Protection (assessment of site contamination) Measure (Amendment, 2013).

The following table presents a summary of the requirements for QC samples and required data validation acceptance criteria.

Table 7: Frequency of Quality Control Samples and Acceptance Criteria

Quality Control Samples	Required Frequency	Acceptance Criteria
Rinsate Blank	1 per day	No contamination present in the rinsate blanks
Method Blanks (Laboratory Blanks)	One per "process batch" and 1 per 20 samples	No contamination present in the method blanks
Field Duplicate (Same Laboratory)	1 per 20 samples	If sample concentration <10x LOR no RPD If sample concentration >10 x LOR <20 x LOR RPD <50% >20 x LOR RPD <30%
Field Triplicate (secondary laboratory)	1 per 20 samples	If sample concentrations <10 x LOR, no RPD limit If Sample concentration <20 x LOR, RPD <50% If Sample concentration >20 x LOR, RPD <30%
Laboratory Duplicate	1 per 10 samples	If Sample concentration <10 x LOR, no RPD If Sample concentration <20 x LOR, RPD <50% If Sample concentration >20 x LOR, RPD <20%
Matrix Spike	One matrix for each soil type Or 1 per 20 samples	% R = 70-130 % RPD < 30% Also refer to laboratory control limits for MS/MSD and laboratory control samples
Laboratory Control Samples	One for each process batch	Laboratory Control Limits (provided in laboratory certificates)
Surrogates	Where required by analytical method.	USEPA surrogate recovery limits.



5.2 Laboratory Testing Protocols

It is proposed that Australian Laboratory Services Pty Ltd (ALS) undertakes the primary and EnviroLab (ELS) the secondary analyses. ALS would sub-contract asbestos analyses to a laboratory NATA accredited for that analysis. ALS and ELS are NATA accredited for all other required analyses.

5.3 Data Quality Objectives for Sample Analysis

The data quality objectives for the field work and laboratory analysis will be implemented during the investigation works to ensure data is valid and complete for the site assessment. The DQOs include the following:

- The sampling program is to characterise the media in the vicinity of investigation locations;
- The LOR will be targeted to be below the adopted criteria (See attached Tables 1 and Table 2)
- Sample preservation, storage, and holding time of samples within acceptable limits;
- Complete field and analytical laboratory sample Chain-of-Custody (CoC) procedures and documentation;
- Analytical results for replicated samples, including field and laboratory duplicates and inter-laboratory duplicates, expressed as Relative Percent Difference (RPD);
- Rinsate blanks will be collected at the frequencies given in Table 7, to assess whether cross-contamination has occurred during field sampling. Results are targeted to be below the laboratory limits of reporting;
- Laboratory spikes, controls and surrogates are targeted to be within 70% and 130% to demonstrate the reliability of the laboratory results reported.

6.0 ADOPTED SITE ASSESSMENT GUIDELINES

It is understood that the amendment of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC, 1999) took effect on 16 May 2013 and includes repealing the original schedules to the NEPM and the substitution of new schedules.

In the preparation of the DSI Report, Golder will adopt the following guidelines:

6.1 Soil Investigation Levels

6.1.1 Health Based Guidelines

The revised NEPM includes updated risk-based Health Investigation Levels (HILs) for selected organic and inorganic chemicals in soils. It is also incorporates the health screening levels (HSLs) for petroleum hydrocarbons in soil, soil vapour and groundwater derived by the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) (CRC CARE, 2011). The soil HSLs replace the NSW EPA (1994) *Contaminated Sites: Service Station Guidelines* (1994) and include criteria for BTEX, naphthalene and TRH.

The HSLs have been developed to provide assessment of chronic human health risks and do not consider issues such as aesthetics, explosion risks or environmental considerations. The soil HSLs, for vapour intrusion, are also considered to be protective of direct contact and the direct contact pathway has not been assessed separately. Different soil HSLs are provided for a variety of exposure settings including: low-high



density residential; recreational/open space; and commercial / industrial land uses. Different soil HSLs have also been derived for different soil types i.e. sand/silt/clay and different depths of impact.

The following assessment criteria have been adopted when evaluating the reported soil analytical results:

- HILs: Based on the current land use zoning, HIL Level A (residential with garden / accessible soil, includes childcare and primary schools), HIL B (residential with minimal opportunities for soil access, includes high-rise buildings and apartments) and HIL D (commercial/industrial, includes shops, factories, offices and industrial sites) are the appropriate HILs for assessing the soil analytical results; and
- HSLs: For the current investigation, the soil vapour intrusion HSLs – A, B and D for low-high density residential use and commercial/industrial use are considered appropriate. Rationale for selection of the applied HILs is detailed below. The soil types to be applied to deriving the appropriate HIL values will be based on the soil assessment results

Table 8::Rationale for Assessing Soil Analytical Results using Soil HSLs for Vapour Intrusion

Criteria	Rationale
Land use	As the site is located within a mixed use zoning (residential/industrial), the HSLs for 'low –high density residential and commercial use' were adopted.

6.1.2 Health Screening Levels (Asbestos)

The revised NEPM includes Health Screening Levels (HSLs) for asbestos in soil, which are based on scenario-specific likely exposure levels, and adopted from *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WA DoH 2009).

For the current investigation, the asbestos contamination in soil HSLs – A, B and D for low-high density residential use and commercial/industrial use are considered appropriate.

6.1.3 Ecological Based Guidelines

The revised NEPM (NEPC, 1999) also requires that ecological assessment be considered on all sites, even those with no significant ecological environments. The revised NEPM includes updated risk-based Ecological Investigation Levels (EIL) for selected organic and inorganic chemicals in soils. It also incorporates the Ecological Screening Levels (ESLs) for petroleum hydrocarbons in soil.

There are three land use scenarios considered for the EILs/ESLs: areas of ecological significance; urban, residential and public open space; and commercial/ industrial. The urban residential and public open space exposure scenario is equivalent to the combined exposure scenarios of residential A & B and recreational open space C, and is therefore considered relevant for the site. The commercial /industrial scenario EILs will also be applied for the reasons outlined in Table 8.

ESLs and EILs are dependent on other various parameters including grain size, pH, cation exchange capacity.

6.1.4 Management limits

The amended NEPM includes 'Management Limits' that are designed to avoid or minimise the potential effects of petroleum hydrocarbons such as:

- Formation of observable Light Non-Aqueous Phase Liquids (LNAPL),
- Fire and explosive hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services by hydrocarbons.

The Management Limits are also considered in the current investigation. The management limits are provided for coarse and fine soils



6.2 Groundwater Investigation Levels

The revised NEPM indicates that site assessment should consider the risks from contaminated groundwater to all potential receptors on and off the site of origin, and the potential effects on groundwater resources. An evaluation of both the ecological and the human receptors and pathways of exposure is therefore required. Groundwater Investigation levels relevant to this investigation included in the revised NEPM include:

- Groundwater HSLs for Vapour Intrusion (NEPM 1999);
- Australian Drinking Water Guidelines (ADWG) (National Health and Medical Research Council (NHMRC) and Natural Resource Management Ministerial Council (NRMMC) 2011); and
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality ANZECC/ARMCANZ (2000).

6.2.1 Human Health Based Assessment

The application of human health based guidelines for groundwater requires an evaluation of exposure scenarios different water bearing zones. It is not expected that the groundwater in the surrounding residential area will be suitable for extraction due to low yield.

6.2.1.1 Perched Water

Evidence of perched water has been identified on site (as seeps from embankments). The perched water is likely to be located within fill and is at shallow depths. While the perched water is not extracted for reuse on site, the shallow depth may result in incidental direct contact by workers during excavation.

Inhalation of vapour from the groundwater may also form a pathway for exposure to site users and occupants. If groundwater is present at less than <2 mBGL, use of the Groundwater HSLs for Vapour Intrusion is precluded.

However, Mance (1984) suggested that environmental quality standards for chemicals in recreational waters should be based on the assumption that recreational water makes only a relatively minor contribution to intake. They assumed a contribution for swimming of an equivalent to 10% of drinking water consumption. Since most authorities (including World Health Organization - WHO) assume consumption of 2 litres of drinking water per day, this would result in an intake of 200 mL per day from recreational contact with water (WHO 2003). This provides for a simple screening approach in which a substance occurring in recreational water at a concentration of 10 times that stipulated in the drinking water guidelines may merit further consideration.

Hence, for the purpose of this investigation, the groundwater data will be assessed relative to the health-based ADWG (2011) criteria with a factor of 10 applied to account for the limited ingestion potential relative to the drinking water exposure assumptions. This approach is considered conservative as swimming is an unlikely recreational activity in the creek, and any primary contact use would most likely be limited to walking or splashing in the creek.

6.2.2 Ecological Based Assessment Criteria – Perched and Deep Groundwater

In accordance with the revised NEPM, the ecological investigation levels used to evaluate the groundwater analytical results have been adopted from ANZECC/ARMCANZ (2000). These guidelines provide environmental based trigger values for concentrations of organic and inorganic chemicals in freshwater and marine aquatic environments.

Due to the location of the site and potential down-gradient receptors (Port Kembla Harbour), which is marine water, the trigger levels for marine aquatic ecosystems have been adopted. The 95% level of protection has been adopted. This protection level applies to ecosystems that could be classified as slightly-moderately disturbed.



7.0 REFERENCES

CRC CARE (2011). *Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, Part 2: Application Document*

Graeme Waller and Associates (August 1996). Environmental Lead Assessment Port Kembla Public School.

Golder Associates (September 2011) Port Kembla Smelter and Refinery Statutory Groundwater Monitoring July 2011.

Golder Associates (November 2012) Former Port Kembla Primary School – Phase I Environmental Site Assessment.

The National Health and Medical Research Council (NHMRC, 2008) Guidelines for Managing Risks in Recreational Water,

NEPC (1999). *National Environmental Protection (Assessment of Site Contamination) Measure (NEPM), Schedule B1 Guideline on Investigation Levels for Soil and Groundwater;*

URS (February 2006) Soil and Groundwater Investigation Port Kembla Copper Smelter Facility, Port Kembla NSW



Report Signature Page

GOLDER ASSOCIATES PTY LTD

CAROLINA OLMOS

Carolina Olmos
Environmental Engineer

Graeme Miller

Graeme Miller
Principal Scientist

CO/GM/co

A.B.N. 64 006 107 857

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation.

c:\users\lgformento\desktop\137623028_001_r_revb_pkc primary school_saqp_final.docx



FIGURES



SAMPLING AND ANALYTICAL
QUALITY PLAN (SAQP) - FORMER
PORT KEMBLA PRIMARY SCHOOL

PORT KEMBLA COPPER PTY LTD

SITE LOCALITY

COPYRIGHT
Base map data copyright MapInfo Australia Pty Ltd



LEGEND

Site Location

0 50 100 200 300 400 500 metres

SCALE (at A4) 1:15,000
Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 137623028
DATE: 11/06/2013
DRAWN: FA
CHECKED: CO

FIGURE 1





SAMPLING AND ANALYTICAL QUALITY
PLAN (SAQP) - FORMER PORT
KEMBLA PRIMARY SCHOOL

PORT KEMBLA COPPER PTY LTD

PROPOSED SAMPLING
LOCATIONS



- LEGEND
- Proposed Test Pit Locations
 - Proposed Borehole Location
 - Proposed Offsite Locations
 - Existing Monitoring Wells
 - Site Location
 - Cadastre

COPYRIGHT

1. Imagery Copyright - Service Layer Credits: © 2010 DigitalGlobe
© 2010 GeoEye © 2013 Microsoft Corporation

2. Base map data copyright MapInfo Australia Pty Ltd

3. Digital Cadastre Database, NSW Department of Lands, 2004

0 10 20 40 60 80 metres

SCALE (at A3) 1:1,500

Coordinate System: GDA 1994 MGA Zone 56

PROJECT: 137623028
DATE: 20/06/2013
DRAWN: FA
CHECKED: CO



FIGURE 2

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Pty Ltd
124 Pacific Highway
St. Leonards, New South Wales 2065
Australia
T: +61 2 9478 3900





APPENDIX B

Site Photographs



APPENDIX B

Selected Site Photographs



Photograph 1 – Previous main building, located in the centre of the site. Photograph taken in August 2013 before the building was completely demolished.



Photograph 2 – Previous main building, located in the centre of the site, and suspected septic tank area. Photograph taken in August 2013 before the building was completely demolished.



APPENDIX B

Selected Site Photographs



Photograph 3 – North west area of the site where test pits TP27, TP28 and TP29 were excavated.



Photograph 4 – North west area of the site, with PKC stack visible beyond the site boundary, where monitoring well MW2 was installed and test pit TP26 excavated.



APPENDIX B

Selected Site Photographs



Photograph 5 – Photograph shows location of BH4/ MW4. Photograph taken during the second stage of works, October 2013, after the main building was demolished.



Photograph 6 – Borehole BH2 at the location of the former main site building, in the centre of the site. Photograph taken during the second stage of works, October 2013



APPENDIX B

Selected Site Photographs



Photograph 7 –Locations of test pit TP20 and monitoring well MW1 (separate locations), near to Reservoir Street site boundary.



Photograph 8 – North west area of the site where test pit TP27 was excavated and monitoring well MW3 installed (separate locations).

j:\env\2013\137623028_pkcphase ii primary schoolport kembla, nsw\correspondence out\003_dsi report_primary school\draft report\appendices\app b - photos\photo appendix_pkc primary school.docx



APPENDIX C

Test Pit and Bore hole Logs



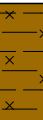
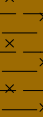
REPORT OF BOREHOLE: BH1

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307778.0 m E 6182175.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.10 m

DRILL RIG: Geoprobe
CONTRACTOR: Matrix Drilling
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0		BH1 0.10 m PID = 0 ppm				Silty CLAY low to medium plasticity, black/dark brown, with some coarse grained sand, no odour, firm, slightly moist	M		
			0.40									
PT			0.5		BH1 0.50 m PID = 0 ppm				Sandy Silty CLAY dark brown, with some coarse grained sand, many fine ironstone fragments noted, stiff, dry	D		
			1.0									
			1.0	1.00	BH1 1.00 m PID = 0 ppm				grading to weathered bedrock, orange brown, stiff			
			1.5						END OF BOREHOLE @ 1.10 m PUSH TUBE REFUSAL			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



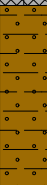
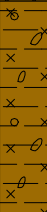
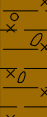
REPORT OF BOREHOLE: BH2

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307798.0 m E 6182189.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.60 m

DRILL RIG: Geoprobe
CONTRACTOR: Matrix Drilling
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling					Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
			0.0		BH2 0.10 m PID = 0 ppm				FILL: Gravelly Sandy CLAY low plasticity, brown, fine gravel, occasional coal wash reject noted, no odour, dry	D			
			0.40										
			0.5		BH2 0.50 m PID = 0 ppm				Sandy CLAY low plasticity, dark brown, coarse grained sand, with some fine gravel, no odour, stiff, slightly moist	M			
			1.0	1.00	BH2 1.00 m PID = 0 ppm				colour grading to orange red brown and dark grey, ironstone layer noted				
			1.5	1.50									
			2.0		BH2 2.00 m PID = 0 ppm				Gravelly Silty CLAY black/orange brown, fine gravel, ironstone fragments, possibly weathered bedrock at 2.0m, moist, soft clay bands noted	D			
			2.20										
			2.5		BH2 2.50 m PID = 0 ppm				soft, moist clay bands noted, very hard				
			3.0						END OF BOREHOLE @ 2.60 m TARGET DEPTH REACHED				
			3.5										
			4.0										
			4.5										
			5.0										

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



REPORT OF BOREHOLE: BH3

SHEET: 1 OF 1

DRILL RIG: Geoprobe

CONTRACTOR: Matrix Drilling

LOGGED: KY DATE: 9/10/13

CHECKED: CO DATE: 15/10/13

CLIENT: Port Kembla

PROJECT: Port Kembla Phase II

LOCATION: Port Kembla Primary School

JOB NO: 137623028

COORDS: 307818.0 m E 6182206.0 m N MGA94 56

SURFACE RL: DATUM: AHD

INCLINATION: -90°

HOLE DEPTH: 1.70 m

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0						FILL: Gravelly Sandy CLAY low plasticity, dark brown, fine gravel, no odour	D	
			0.30		BH3 0.10 m PID = 0 ppm						
			0.5		BH3 0.40 m PID = 0 ppm				Silty CLAY low to medium plasticity, dark brown mottled red, soft, moist	M	
			1.0		BH3 1.00 m PID = 0 ppm				becoming firm, minor fine gravel content, slightly moist		
			1.20						Gravelly Silty CLAY orange brown, no odour, very hard, dry	D	
PT											
Solid Auger			1.5								
			2.0		BH3 1.70 m PID = 0 ppm				END OF BOREHOLE @ 1.70 m SOLID AUGER REFUSAL		
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



REPORT OF BOREHOLE: BH4

SHEET: 1 OF 1

DRILL RIG: Geoprobe

CONTRACTOR: Matrix Drilling

LOGGED: KY DATE: 9/10/13

CHECKED: CO DATE: 15/10/13

CLIENT: Port Kembla

PROJECT: Port Kembla Phase II

LOCATION: Port Kembla Primary School

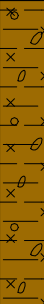
JOB NO: 137623028

COORDS: 307793.0 m E 6182236.0 m N MGA94 56

SURFACE RL: DATUM: AHD

INCLINATION: -90°

HOLE DEPTH: 2.30 m

Drilling					Sampling		Field Material Description												
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION			MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS				
HA			0.0	0.05	BH4 0.05 m PID = 0 ppm				BITUMEN SURFACE			M							
			FILL: Gravelly Silty CLAY low plasticity, black, fine gravel, some coal wash reject noted, no odour, soft, moist																
PT			0.30		BH4 0.40 m PID = 0 ppm				FILL: colour graded to yellow brown, coal washery reject noted, moist, possible metal slag noted at 0.5m			W							
			Gravelly Silty CLAY black, very moist to wet																
			0.50						BH4 0.80 m PID = 0 ppm BH4 1.00 m PID = 0 ppm			Gravelly Silty CLAY low plasticity, green-brown/black, with some fine gravel, ironstone fragment, no odour, soft, moist			M				
			0.80									CLAY colour graded to orange brown, with some gravel, layer very moist (possible weathered bedrock)							
			1.00									Weathered Bedrock, firm clay lenses noted, orange brown, no odour, presented as rgavelly silty clay							
			1.50									END OF BOREHOLE @ 2.30 m TARGET DEPTH REACHED							
			1.90		BH4 1.80 m PID = 0 ppm		Qz					D							
			2.00		BH4 2.20 m PID = 0 ppm		Qz												
			2.50																
			3.00																
			3.50																
			4.00																
			4.50																

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



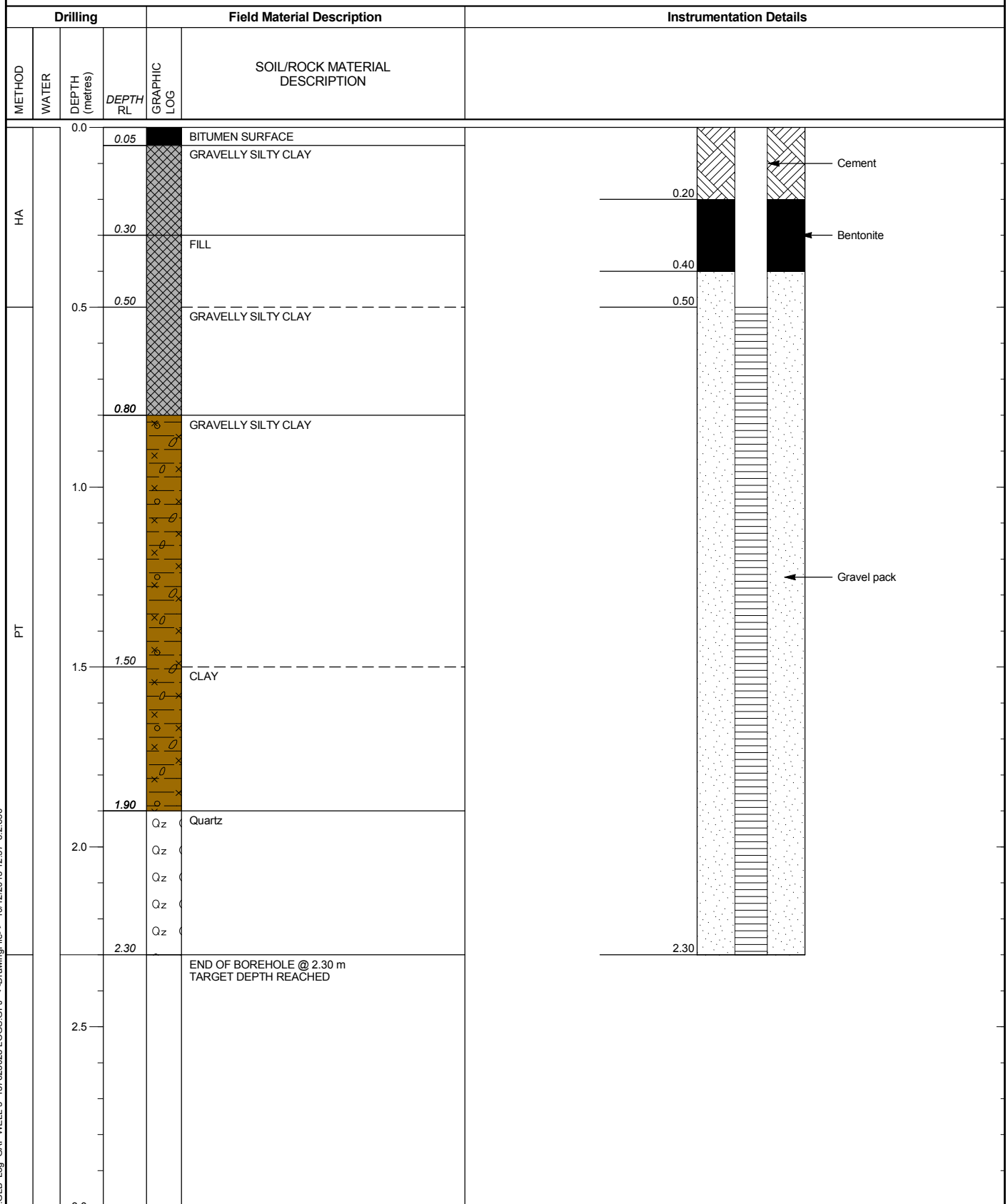
REPORT OF STANDPIPE INSTALLATION: BH4

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307793.0 m E 6182236.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.30 m

DRILL RIG: Geoprobe
CONTRACTOR: Matrix Drilling
LOGGED: KY
CHECKED: CO
DATE: 9/10/13
DATE: 15/10/13



This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F17
RL1



REPORT OF BOREHOLE: BH5

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307771.0 m E 6182225.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.60 m

DRILL RIG: Geoprobe
CONTRACTOR: Matrix Drilling
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0					BITUMEN		
			0.05					FILL: SAND fine grained, white and dark brown, no odour, very moist	M	
			0.20		BH5 0.10 m PID = 0 ppm			Gravelly Silty CLAY low plasticity, orange brown/brown, firm, dry, no odour, ironstone fragments noted		
			0.5		BH5 0.30 m PID = 0 ppm					
PT			0.80					Silty CLAY low plasticity, black, trace fine gravel, wet clay lenses noted, no odour, soft	D	
			1.00		BH5 1.00 m PID = 0 ppm			Gravelly Silty CLAY low plasticity, yellow/orange brown, fine gravel, very weathered bedrock, stiff, dry		
			1.5							
			1.60		BH5 1.50 m PID = 0 ppm			END OF BOREHOLE @ 1.60 m TARGET DEPTH REACHED		
			2.0							
			2.5							
			3.0							
			3.5							
			4.0							
			4.5							
			5.0							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



REPORT OF BOREHOLE: BH6

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307754.0 m E 6182208.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.00 m

DRILL RIG: Geoprobe
CONTRACTOR: Matrix Drilling
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description							
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0						Silty CLAY low plasticity, dark brown, with some fine gravel, dry, no odour				
			0.20	BH6 0.10 m PID = 0 ppm									
PT			0.5		BH6 0.30 m PID = 0 ppm				Gravelly Silty CLAY low plasticity, yellow/orange brown, potentially weathered bedrock, no odour, hard	D			
			1.00	BH6 1.00 m PID = 0 ppm				becoming very stiff					
			2.0		BH6 2.00 m PID = 0 ppm				END OF BOREHOLE @ 2.00 m TARGET DEPTH REACHED				
			2.5										
			3.0										
			3.5										
			4.0										
			4.5										
			5.0										
			5.5										

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



REPORT OF BOREHOLE: MW1

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307834.0 m E 6182234.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.60 m

DRILL RIG: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description								
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0						TOPSOIL: Sandy CLAY low plasticity, dark brown, very soft, no odour, very moist	M	VS	Water seepage at 0.60m		
			0.20					FILL: Silty CLAY low plasticity, dark brown-red brown, with some sandy clay and fine to coarse gravel fragments and boulders, very soft, very moist to wet, soft	M - W	S				
			0.5											
			0.90					Gravelly Silty CLAY low plasticity, red brown, fine gravel, very soft, moist	M	VS				
			1.5	1.50				grading to red orange brown, with some ironstone fragments						
									END OF BOREHOLE @ 1.60 m					
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



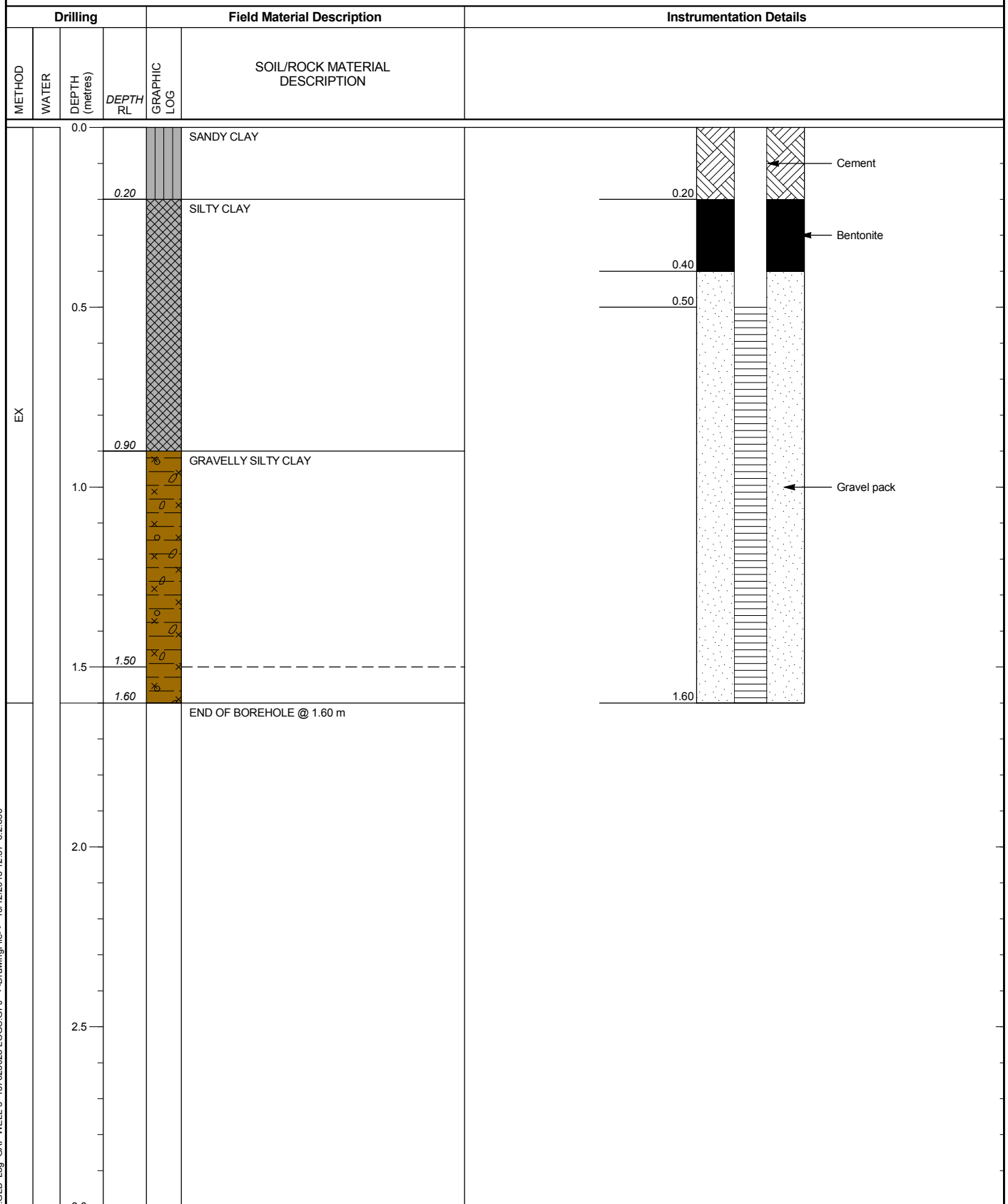
REPORT OF STANDPIPE INSTALLATION: MW1

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307834.0 m E 6182234.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.60 m

DRILL RIG: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13



This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F17
RL1



REPORT OF BOREHOLE: MW2

SHEET: 1 OF 1

DRILL RIG: 5T Excavator

CONTRACTOR: Affective Services

LOGGED: KY DATE: 9/10/13

CHECKED: CO DATE: 15/10/13

CLIENT: Port Kembla

PROJECT: Port Kembla Phase II

LOCATION: Port Kembla Primary School

JOB NO: 137623028

COORDS: 307770.0 m E 6182264.0 m N MGA94 56

SURFACE RL: DATUM: AHD

INCLINATION: -90°

HOLE DEPTH: 2.60 m

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0						FILL: Silty CLAY low plasticity, dark brown/black, with some fine gravel, no odour, moist			
			0.5	0.60					metal pipe at 0.60m	M		
			0.90						becoming orange brown after 0.90m, no odour, slightly moist			
			1.50	1.50								
			2.00	2.00					FILL: Gravelly CLAY low plasticity, orange brown/yellow brown, soft, bricks observed, wet, soft	W		Water at 1.60m
						Qz			WEATHERED BEDROCK yellow brown/orange brown, with some clay and ironstone fragments, dry		S	
						Qz						
						Qz				D		
						Qz						
						Qz						
									END OF BOREHOLE @ 2.60 m TARGET DEPTH REACHED			
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



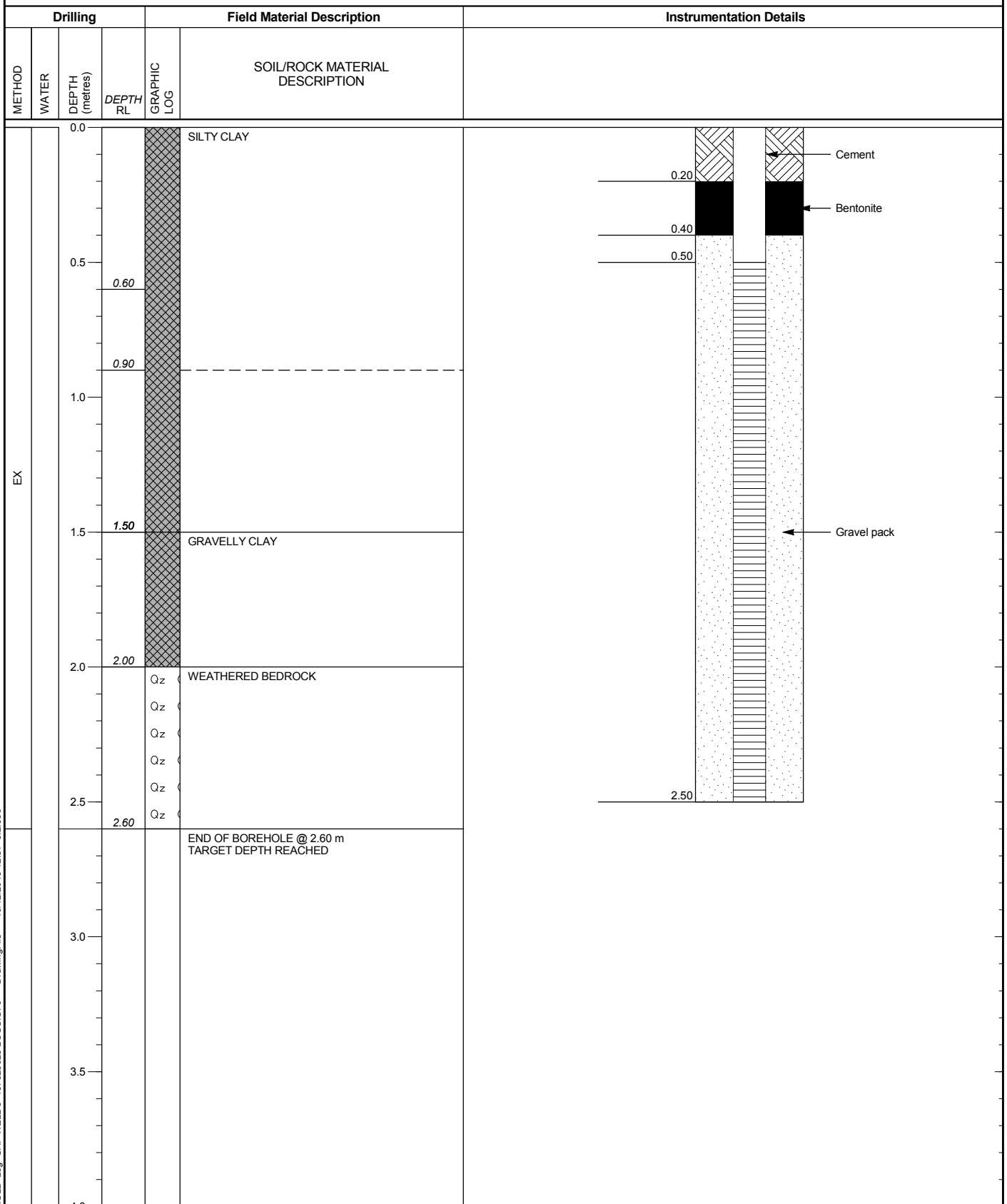
REPORT OF STANDPIPE INSTALLATION: MW2

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307770.0 m E 6182264.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 2.60 m

DRILL RIG: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13



This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F17
RL1



REPORT OF BOREHOLE: MW3

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307707.0 m E 6182253.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.60 m

DRILL RIG: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description								
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0						FILL: Silty CLAY low plasticity, black/dark brown, no odour, moist, soft, glass, bricks and boulders were observed	M	S	Water seepage at 0.60m		
			0.5	0.50				coal washery reject layer						
			0.80						WEATHERED BEDROCK yellow orange-brown, with some clay, dry, hard	D	H			
			1.0											
			1.5											
			2.0						END OF BOREHOLE @ 1.60 m TARGET DEPTH REACHED					
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
RL3



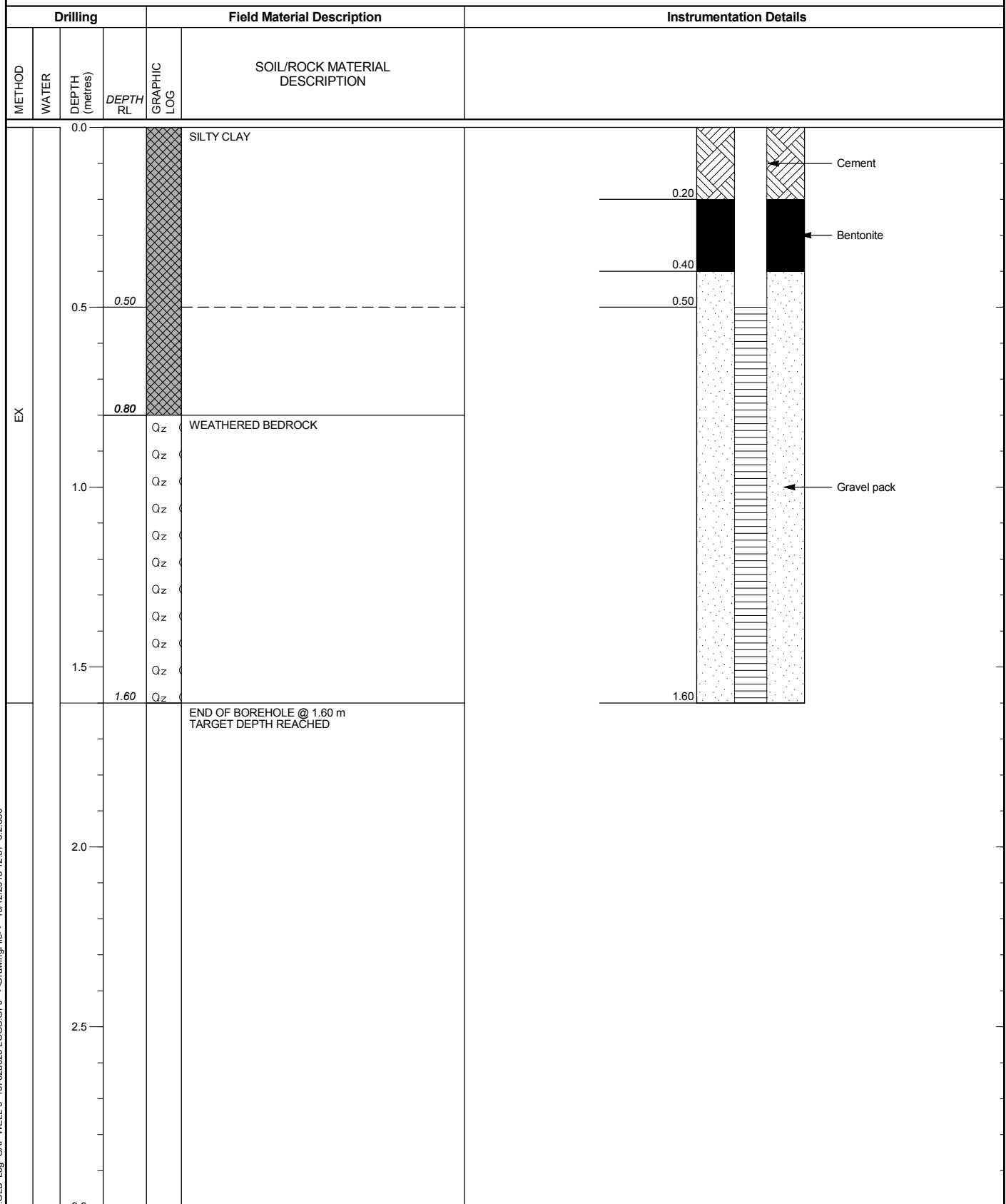
REPORT OF STANDPIPE INSTALLATION: MW3

SHEET: 1 OF 1

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307707.0 m E 6182253.0 m N MGA94 56
SURFACE RL: DATUM: AHD
INCLINATION: -90°
HOLE DEPTH: 1.60 m

DRILL RIG: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 9/10/13
CHECKED: CO DATE: 15/10/13



This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F17
RL1



REPORT OF HAND AUGERED BOREHOLE: OL1

SHEET: 1 OF 1

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307932.0 m E 6182172.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 INCLINATION: -90°
 HOLE DEPTH: 0.50 m

LOGGED: KY DATE: 27/6/13
 CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0		OL1 0.00-0.20 m PID = 0 ppm				CLAY low plasticity, black/dark brown, with some fine gravel content, no odour, stiff	M	
			0.20		OL1 0.30-0.50 m PID = 0 ppm				CLAY low plasticity, yellow-brown, minor content of gravel, no odour, firm	F	
			0.5						END OF HAND AUGER @ 0.50 m TOP OF WEATHERED BEDROCK		
			1.0								
			1.5								
			2.0								
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of hand augered borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
 RL3



REPORT OF HAND AUGERED BOREHOLE: OL2

SHEET: 1 OF 1

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307897.0 m E 6182206.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 INCLINATION: -90°
 HOLE DEPTH: 0.70 m

LOGGED: KY DATE: 27/6/13
 CHECKED: CO DATE: 15/10/13

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA			0.0		OL2 0.00-0.20 m PID = 0 ppm				Sandy CLAY low plasticity, black, fine grained sand, with minor content of fine gravel, very moist, very soft		VS	
			0.30		OL2 0.30-0.50 m PID = 0 ppm				CLAY low plasticity, black to orange brown, with minor content of fine gravel, no odour, very moist, stiff	M	St	
			0.5									
			1.0						END OF HAND AUGER @ 0.70 m TOP OF WEATHERED BEDROCK			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of hand augered borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01a
 RL3



REPORT OF TEST PIT: TP01

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307849.0 m E 6182082.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 27/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP01 0.00-0.10 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, dark brown/black, no odour, very moist, very soft	VS	Water seepage at 0.20m
			0.40								
			0.5		TP01 0.50-0.60 m PID = 0 ppm				Gravelly CLAY low plasticity, yellow/orange brown, fine gravel, no odour, slightly moist, firm	M	
			0.90							F	
			1.0		TP01 0.90-1.00 m PID = 0 ppm			Qz	BEDROCK orange-brown, with many ironstone fragments noted, dry		
									TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED		
			1.5								
			2.0								
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.



REPORT OF TEST PIT: TP02

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307870.0 m E 6182103.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 PIT DEPTH: 1.30 m
 BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
 MACHINE: 5T Excavator
 CONTRACTOR: Affective Services
 LOGGED: KY DATE: 27/6/13
 CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP02 0.00-0.10 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, no odour, very moist, very soft	M - W	VS	
			0.30		TP02 0.30-0.40 m PID = 0 ppm				CLAY low plasticity, with some fine grained sand and fine gravel, no odour, moist, firm			
			0.80							M	F	
			1.0		TP02 0.90-1.00 m PID = 0 ppm			Qz	BEDROCK weathered, orange and red, with many fine gravel and ironstone contents and some clay, no odour, moist			
			1.5						TEST PIT DISCONTINUED @ 1.30 m TARGET DEPTH REACHED			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.



REPORT OF TEST PIT: TP03

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307898.0 m E 6182122.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.20 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 27/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling			Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0		TP03 0.00-0.10 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, brown, fine grained sand, (minor content of dark grey sand also noted), no odour, very moist, very soft, coal wash reject noted		VS			
			0.30					FILL: CLAY low plasticity, orange brown and black/grey of coal washery reject (CWR), no odour, moist, firm	M					
			0.5		TP03 0.50-0.60 m PID = 0 ppm					F				
			0.80				Qz	BEDROCK weathered, orange brown, with many gravel and ironstone fragments, no odour, dry	D					
			1.0		TP03 0.90-1.00 m PID = 0 ppm		Qz							
									TEST PIT DISCONTINUED @ 1.20 m TARGET DEPTH REACHED					
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP04

CLIENT: Port Kembla

PROJECT: Port Kembla Phase II

LOCATION: Port Kembla Primary School

JOB NO: 137623028

COORDS: 307919.0 m E 6182142.0 m N MGA94 56

SURFACE RL: DATUM: AHD

PIT DEPTH: 1.00 m

BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1

MACHINE: 5T Excavator

CONTRACTOR: Affective Services

LOGGED: KY

DATE: 27/6/13

CHECKED: CO

DATE: 15/10/13

Excavation					Sampling		Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0		TP04 0.00-0.10 m PID = 0 ppm				FILL: SAND fine grained, pale brown, very moist	M				
			0.30											
			0.5		TP04 0.50-0.60 m PID = 0 ppm			Qz	BEDROCK weathered, brown, with many gravel and ironstone fragments, dry	D				
								Qz						
								Qz						
			1.0		TP04 0.90-1.00 m PID = 0 ppm			Qz	TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED					
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											



REPORT OF TEST PIT: TP05

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307831.0 m E 6182107.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.20 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 27/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP05 0.00-0.10 m PID = 0 ppm TP05 0.50-0.60 m QC102 / QC202 PID = 0 ppm TP05 0.90-1.00 m PID = 0 ppm TP05 1.10-1.20 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, brown, fine grained sand, no odour, very moist, very soft	M	VS	
		0.20					FILL: Silty CLAY low plasticity, black, with some fine gravel contents, bricks and ceramic bottles noted, moist, very soft					
		0.5	0.60				Gravelly CLAY low plasticity, orange brown mottled white and red, with some fine grained sand, moist, firm	F				
		1.0	1.00			Qz	WEATHERED BEDROCK orange brown and red brown, with some clay and ironstone fragments, dry		D			
							Qz	TEST PIT DISCONTINUED @ 1.20 m TARGET DEPTH REACHED				
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 27/6/13
CHECKED: CO DATE: 15/10/13

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP07

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307876.0 m E 6182143.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 27/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP07 0.00-0.10 m PID = 0 ppm				FILL: Clayey SAND fine grained, brown, some dark grey, concrete post noted, no odour, moist		
			0.20								
			0.5		TP07 0.30-0.40 m PID = 0 ppm				FILL: Gravelly CLAY low plasticity, black, many fine gravel, some bricks and boulders noted, very moist, very soft	VS	
			0.90		TP07 0.50-0.60 m PID = 0 ppm				CLAY orange brown mottled black, with some fine grained sand/gravel content, no odour, moist	M	
			1.0		TP07 0.90-1.00 m PID = 0 ppm				grading to weathered bedrock, orange brown, with some clay and fine gravel content, no odour, dry	F	
									TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED		
			1.5								
			2.0								
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP08

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307901.0 m E 6182160.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0		TP08 0.00-0.10 m QC101 QC201 PID = 0 ppm				Sandy CLAY low plasticity, black, fine grained sand, firm clay, trace gravel, no odour, moist					
			0.30						CLAY orange/yellow brown, with some fine gravel, stiff, slightly moist	M				
			0.5		TP08 0.50-0.60 m PID = 0 ppm									
			0.80				Qz	WEATHERED BEDROCK brown/orange brown, with some clay and gravel fragments, dry	D					
			1.0		TP08 0.90-1.00 m PID = 0 ppm			Qz	TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED					
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP09

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307809.0 m E 6182136.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 PIT DEPTH: 0.80 m
 BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
 MACHINE: 5T Excavator
 CONTRACTOR: Affective Services
 LOGGED: KY DATE: 26/6/13
 CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description							
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP09 0.00-0.10 m PID = 0 ppm				TOPSOIL: Sandy CLAY low plasticity, black, very soft, no odour, wet, very soft	W	VS		
			0.20										
			0.5		TP09 0.30-0.40 m PID = 0 ppm				FILL: Silty CLAY low plasticity, black, bricks, glass and coal washery reject noted, no odour, moist, soft	M	S		
					TP09 0.50-0.60 m PID = 0 ppm				Silty CLAY low to medium plasticity, orange brown, with some fine gravel content, moist				
			1.0						TEST PIT DISCONTINUED @ 0.80 m DUE TO REFUSAL TARGET DEPTH REACHED				
			1.5										
			2.0										
			2.5										
			3.0										
			3.5										
			4.0										
			4.5										
			5.0										

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.



SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP11

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307854.0 m E 6182161.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.50 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0						CONCRETE			
			0.10		TP11 0.10-0.20 m PID = 0 ppm				FILL: SAND fine grained, pale brown, with some stiff clay, bricks and boulders, no odour, moist, minor coal wash reject content noted			
			0.40									
			0.5		TP11 0.50-0.60 m PID = 0 ppm				CLAY low plasticity, orange brown, with some fine gravel and sand, no odour, slightly moist, firm	M		
			1.0	1.00	TP11 0.90-1.00 m PID = 0 ppm				WEATHERED BEDROCK orange brown, with some stiff clay, fine gravel and ironstone content, dry		D	
			1.5		TP11 1.40-1.50 m PID = 0 ppm				TEST PIT DISCONTINUED @ 1.50 m TARGET DEPTH REACHED			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP12A

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307873.0 m E 6182188.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 0.50 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP12A 0.10-0.20 m Asbestos Sample PID = 0 ppm				FILL: Silty CLAY dark brown, soft, asbestos noted, wet	W		
			0.5						TEST PIT DISCONTINUED @ 0.50 m HOLE ABANDONED DUE TO ASBESTOS			
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP13

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307795.0 m E 6182152.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.80 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP13 0.00-0.00 m PID = 0 ppm				TOPSOIL: Sandy CLAY low plasticity, black, no odour, slightly moist, soft			
			0.20						FILL: Clayey SAND fine grained, yellow brown, with some clay (dark brown, low plasticity and firm), slightly moist, firm	M		
			0.5		TP13 0.50-0.60 m PID = 0 ppm							
			0.90		TP13 0.90-1.00 m PID = 0 ppm				with some big boulders, timber and gravel fragments were observed, becoming wet	W		
			1.50		TP13 1.50-1.60 m PID = 0 ppm		Qz		WEATHERED BEDROCK orange brown, with some clay, slightly moist	M		
			2.0						TEST PIT DISCONTINUED @ 1.80 m TARGET DEPTH REACHED			
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP14

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307811.0 m E 6182167.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.50 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP14 0.00-0.10 m PID = 0 ppm				FILL: Clayey SAND fine grained, brown/dark grey, with some fine gravel, no odour, moist			Water seepage at 0.20m
			0.50		TP14 0.50-0.60 m PID = 0 ppm				Silty CLAY low plasticity, with some fine gravel and ironstone fragments gravel, moist, stiff	M		
			0.90		TP14 0.90-1.00 m PID = 0 ppm				becoming softer after 0.90m with red mottling, firm			
			1.30									
			1.50		TP14 1.40-1.50 m PID = 0 ppm				WEATHERED BEDROCK orange brown, with some white gravel fragments, dry	D		
			1.5						TEST PIT DISCONTINUED @ 1.50 m TARGET DEPTH REACHED			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP15

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307837.0 m E 6182188.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description								
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0		TP15 0.00-0.10 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, brown/dark brown, fine grained sand, with some coal washery reject and boulders, moist, soft					
			0.40											
			0.5		TP15 0.50-0.60 m PID = 0 ppm				Silty CLAY low plasticity, orange brown, with many fine gravel, moist, soft		M	S		
			0.90											
			1.0		TP15 0.90-1.00 m PID = 0 ppm				WEATHERED BEDROCK orange brown, with some clay, no odour, slightly moist					
									TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED					
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.



REPORT OF TEST PIT: TP16A

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307860.0 m E 6182211.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 PIT DEPTH: 1.00 m
 BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
 MACHINE: 5T Excavator
 CONTRACTOR: Affective Services
 LOGGED: KY DATE: 26/6/13
 CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP16A 0.00-0.10 m PID = 0 ppm				FILL: Sandy CLAY low plasticity, brown, fine grained sand, no odour, soft, moist	M	Wet at 0.70m
			0.20		TP16A 0.20-0.30 m PID = 0 ppm				coal washery reject layer		
			0.30						grading to Silty CLAY, black/dark brown, low plasticity, coal washery reject, bricks and boulders were observed, no odour, wet	S	
			0.5		TP16A 0.50-0.60 m PID = 0 ppm					W	
			0.90		TP16A 0.90-1.00 m Asbestos Sample				asbestos layer noted		
			1.0						TEST PIT DISCONTINUED @ 1.00 m HOLE ABANDONED DUE TO ASBESTOS		
			1.5								
			2.0								
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
 RL3



REPORT OF TEST PIT: TP16B

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307858.0 m E 6182206.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 0.20 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0						FILL: Sandy CLAY asbestos noted			
								TEST PIT DISCONTINUED @ 0.20 m HOLE ABANDONED DUE TO ASBESTOS				
			0.5									
			1.0									
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 26/6/13
CHECKED: CO DATE: 15/10/13

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP24

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307724.0 m E 6182225.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 PIT DEPTH: 1.00 m
 BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
 MACHINE: 5T Excavator
 CONTRACTOR: Affective Services
 LOGGED: KY DATE: 26/6/13
 CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP24 0.00-0.10 m PID = 0 ppm				FILL: Silty CLAY low plasticity, dark brown, possibly reworked material, no odour, very moist, very soft		
			0.40								
			0.5		TP24 0.50-0.60 m PID = 0 ppm				CLAY low plasticity, orange brown, firm, trace fine gravel, slightly moist, firm	M	
			0.90								
			1.0		TP24 0.90-1.00 m PID = 0 ppm		Qz		WEATHERED BEDROCK orange brown, with some clay content, dry	D	
									TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED		
			1.5								
			2.0								
			2.5								
			3.0								
			3.5								
			4.0								
			4.5								
			5.0								

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
 RL3



REPORT OF TEST PIT: TP25

CLIENT: Port Kembla
 PROJECT: Port Kembla Phase II
 LOCATION: Port Kembla Primary School
 JOB NO: 137623028

COORDS: 307748.0 m E 6182242.0 m N MGA94 56
 SURFACE RL: DATUM: AHD
 PIT DEPTH: 2.00 m
 BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
 MACHINE: 5T Excavator
 CONTRACTOR: Affective Services
 LOGGED: KY DATE: 26/6/13
 CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP25 0.00-0.10 m QC100 / QC200 PID = 0 ppm				FILL: Silty CLAY low plasticity, dark brown, with some coal washery reject and dark grey sand, no odour, very moist			Water seepage at 0.20m
			0.5	0.50	TP25 0.50-0.60 m PID = 0 ppm				grading to gravelly clay, firm, low plasticity, orange brown/red brown, some fine gravels and minor boulders observed, no odour, moist, firm		F	
			1.0	1.00	TP25 0.90-1.00 m PID = 0 ppm				being slightly moist after 1.0m		M	
			1.5	1.50	TP25 1.50-1.60 m PID = 0 ppm				CLAY low to medium plasticity, dark grey mottled red-brown, trace fine white gravel, no odour, soft		S	
			1.9	1.90	TP25 1.90-2.00 m PID = 0 ppm				WEATHERED BEDROCK orange brown, with some clay, with some ironstone fragments			
			2.0				Qz		TEST PIT DISCONTINUED @ 2.00 m TARGET DEPTH REACHED			
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
 RL3



REPORT OF TEST PIT: TP26

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307770.0 m E 6182264.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 2.60 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 25/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP26 0.00-0.10 m PID = 0 ppm				FILL: Silty CLAY low plasticity, dark brown/black, with some fine gravel, no odour, moist				
			0.5	0.60	TP26 0.50-0.60 m PID = 0 ppm				metal pipe at 0.60m		M		
			0.90		TP26 0.90-1.00 m PID = 0 ppm				becoming orange brown after 0.90m, no odour, slightly moist				
			1.50		TP26 1.50-1.60 m PID = 0 ppm				FILL: Gravelly CLAY low plasticity, orange brown/yellow brown, soft, bricks observed, wet, soft		W	Water at 1.60m	
			2.00		TP26 2.00-2.10 m PID = 0 ppm		Qz		WEATHERED BEDROCK yellow brown/orange brown, with some clay and ironstone fragments, dry		S		
			2.5		TP26 2.50-2.60 m PID = 0 ppm		Qz				D		
									TEST PIT DISCONTINUED @ 2.60 m TARGET DEPTH REACHED				
			3.0										
			3.5										
			4.0										
			4.5										
			5.0										

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP27

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307707.0 m E 6182253.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.60 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 25/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description						
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP27 0.00-0.10 m PID = 0 ppm				FILL: Silty CLAY low plasticity, black/dark brown, no odour, moist, soft, glass, bricks and boulders were observed	M	S	Water seepage at 0.60m
			0.5	0.50	TP27 0.50-0.60 m PID = 0 ppm				coal washery reject layer			
			0.80		TP27 0.90-1.00 m PID = 0 ppm		Qz	WEATHERED BEDROCK yellow orange-brown, with some clay, dry, hard	D	H		
			1.0				Qz					
			1.5		TP27 1.50-1.60 m PID = 0 ppm		Qz					
									TEST PIT DISCONTINUED @ 1.60 m TARGET DEPTH REACHED			
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP28

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307738.0 m E 6182268.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.60 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 25/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description								
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY	DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS		
EX			0.0		TP28 0.00-0.10 m PID = 0 ppm				FILL: Silty CLAY low plasticity, black, soft, no odour, moist, soft, coal slag noted		S				
			0.20												
					TP28 0.50-0.60 m PID = 0 ppm		Qz	Silty CLAY medium plasticity, orange brown, with some fine gravel fragments, no odour, moist, soft							
						Qz									
			0.5			Qz									
						Qz									
			0.80		TP28 0.90-1.00 m PID = 0 ppm		Qz	trace sandy clay at 0.80m							
			1.0			Qz	becoming dark brown after 0.90m, slightly moist, low plasticity, hard, no odour								
						Qz									
						Qz									
			1.5		TP28 1.50-1.60 m PID = 0 ppm		Qz	WEATHERED BEDROCK orange brown, with some gravel, no odour							
						TEST PIT DISCONTINUED @ 1.60 m TARGET DEPTH REACHED									
			2.0												
			2.5												
			3.0												
			3.5												
			4.0												
			4.5												
			5.0												

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



REPORT OF TEST PIT: TP29

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307690.0 m E 6182290.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 25/6/13
CHECKED: CO DATE: 15/10/13

Excavation				Sampling		Field Material Description								
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION		MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
EX			0.0		TP29 0.00-0.10 m PID = 0 ppm				Silty CLAY low plasticity, dark brown, with some gravel, no odour, very moist, soft, reqorked	M	S		Water noted at 0.30m	
			0.30		TP29 0.30-0.40 m PID = 0 ppm				with some fine grained dark grey sand, no odour, moist					
			0.50		TP29 0.50-0.60 m PID = 0 ppm				CLAY medium plasticity, yellow/orange brown, soft, no odour, moist, soft					
			0.90		TP29 0.90-1.00 m PID = 0 ppm			Qz	WEATHERED BEDROCK orange-brown, with some clay, no odour, dry	D				
			1.0						TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED					
			1.5											
			2.0											
			2.5											
			3.0											
			3.5											
			4.0											
			4.5											
			5.0											

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.



REPORT OF TEST PIT: TP30

CLIENT: Port Kembla
PROJECT: Port Kembla Phase II
LOCATION: Port Kembla Primary School
JOB NO: 137623028

COORDS: 307660.0 m E 6182302.0 m N MGA94 56
SURFACE RL: DATUM: AHD
PIT DEPTH: 1.00 m
BUCKET TYPE: 80cm x 60cm

SHEET: 1 OF 1
MACHINE: 5T Excavator
CONTRACTOR: Affective Services
LOGGED: KY DATE: 25/6/13
CHECKED: CO DATE: 15/10/13

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX			0.0		TP30 0.00-0.10 m PID = 0 ppm				Silty CLAY low plasticity, black, with many fine to large gravel fragments, no odour, very moist, reworked	M	S	Water seepage at 0.40m
			0.5	0.50	TP30 0.50-0.60 m PID = 0 ppm				CLAY medium plasticity, yellow-brown, soft, no odour, moist, soft			
			0.80		TP30 0.90-1.00 m PID = 0 ppm			Qz	WEATHERED BEDROCK yellow-brown, with some clay content, dry	D	F	
			1.0					Qz	TEST PIT DISCONTINUED @ 1.00 m TARGET DEPTH REACHED			
			1.5									
			2.0									
			2.5									
			3.0									
			3.5									
			4.0									
			4.5									
			5.0									

This report of test pit must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01e
RL3



APPENDIX D

Tables of Analytical Results

Table 1 - Soil Analytical Results - Total Metals
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location: Sample ID : Sample Depth: Sample Matrix: Sample Date: Sample Type:					TP1		TP2		TP3		TP4		TP5				TP6		TP7	
					TP1_0.0-0.1	TP1_0.9-1.0	TP2_0.0-0.1	TP2_0.2-0.4	TP3_0.0-0.1	TP3_0.5-0.6	TP4_0.0-0.1	TP4_0.5-0.6	TP5_0.5-0.6	QC102	QC202	TP5_0.9-1.0	TP6_0.2-0.3	TP6_0.5-0.6	TP7_0.3-0.4	TP7_0.5-0.6
					0.0-0.1	0.9-1.0	0.0-0.1	0.2-0.4	0.0-0.1	0.5-0.6	0.0-0.1	0.5-0.6	0.5-0.6	0.5-0.6	0.5-0.6	0.9-1.0	0.2-0.3	0.5-0.6	0.3-0.4	0.5-0.6
					Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Fill/Sand	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay
					27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013
					PS	PS	PS	PS	PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D																
Moisture																				
Moisture Content	%	1			26	9.6	17.1	31.6	30.5	30.9	26.5	17.9	26.1	26.1	27	25.2	37.3	28.8	21.2	33.8
Total Metals																				
Arsenic	mg/kg	5	500	3000	6	<5	<5	<5	8	<5	<5	9	33	<5	7	<5	37	<5	7	<5
Cadmium	mg/kg	1	150	900	<1	<1	<1	<1	3	<1	<1	<1	4	4	1.9	<1	27	<1	<1	<1
Chromium	mg/kg	2	500*	3600*	13	14	10	20	7	25	3	16	13	12	8	17	5	22	20	24
Copper	mg/kg	5	30000	240000	140	87	10	82	589	80	287	78	467	59	130	69	2740	61	66	77
Lead	mg/kg	5	1200	1500	29	<5	9	7	120	12	126	22	71	9	17	<5	216	7	19	9
Manganese	mg/kg	5	14000	60000	374	38	428	<5	135	19	216	21	94	37	28	<5	362	48	50	20
Mercury	mg/kg	0.1	120**	730**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1200	6000	11	9	7	3	6	4	2	3	6	5	3	<2	14	4	3	4
Selenium	mg/kg	5	1400	10000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<2	<5	<5	<5	<5	<5
Zinc	mg/kg	5	60000	400000	68	33	18	12	152	25	32	16	112	104	40	15	500	9	41	24

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate
* As Chromium VI ** As Mercury Inorganic

Values that exceed the investigations level are highlighted as:
Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 1999 - Amend 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 1999 - Amend 2013)

Table 1 - Soil Analytical Results - Total Metals
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location: Sample ID : Sample Depth: Sample Matrix: Sample Date: Sample Type:					TP8				TP9		TP10		TP11		TP12		TP13	
					TP8_0.0-0.1	QC101	QC202	TP8_0.9-1.0	TP9_0.3-0.4	TP9_0.5-0.6	TP10_0.0-0.1	TP10_0.5-0.6	TP11_0.1-0.2	TP11_0.9-1.0	TP12_0.0-0.1	TP12_0.9-1.0	TP13_0.5-0.6	TP13_1.5-1.6
					0.0-0.1	0.0-0.1	0.0-0.1	0.9-1.0	0.3-0.4	0.5-0.6	0.0-0.1	0.5-0.6	0.1-0.2	0.9-1.0	0.0-0.1	0.9-1.0	0.5-0.6	1.5-1.6
					Fill/Sand	Fill/Sand	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay
					26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
					PS	FD	FT	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D														
Moisture																		
Moisture Content	%	1			26.6	32.8	38	21.6	26.1	30.1	31.2	29.7	27.1	13.9	39	19.2	24.1	29
Total Metals																		
Arsenic	mg/kg	5	500	3000	41	44	21	<5	36	<5	31	<5	<5	<5	10	<5	17	<5
Cadmium	mg/kg	1	150	900	10	14	7.3	<1	11	<1	3	<1	<1	<1	3	<1	<1	<1
Chromium	mg/kg	2	500*	3600*	22	23	13	12	21	21	16	24	19	14	10	19	10	15
Copper	mg/kg	5	30000	240000	2280	1760	1800	76	1020	82	422	88	201	73	961	116	171	63
Lead	mg/kg	5	1200	1500	677	628	340	<5	192	10	124	9	21	6	173	6	38	6
Manganese	mg/kg	5	14000	60000	609	492	410	28	111	9	88	15	39	21	456	64	72	35
Mercury	mg/kg	0.1	120**	730**	0.3	0.4	0.6	<0.1	0.3	<0.1	0.2	<0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1200	6000	12	12	12	5	9	2	6	4	6	5	8	14	4	2
Selenium	mg/kg	5	1400	10000	<5	<5	4	<5	<5	<5	<5	<5	<5	<5	6	<5	<5	<5
Zinc	mg/kg	5	60000	400000	397	529	360	31	443	17	256	27	92	38	187	88	35	21

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate
* As Chromium VI ** As Mercury Inorganic

Values that exceed the investigations level are highlighted as:

Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 1999 - Amend 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 1999 - Amend 2013)

Table 1 - Soil Analytical Results - Total Metals
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location: Sample ID : Sample Depth: Sample Matrix: Sample Date: Sample Type:					TP14		TP15		TP16A		TP20_0.5-0.6		TP24		TP25			
					TP14_0.0-0.1	TP14_0.5-0.6	TP15_0.0-0.1	TP15_0.9-1.0	TP16A_0.2-0.3	TP16A_0.5-0.6	TP20_0.5-0.6	TP20_0.9-1.0	TP24_0.0-0.1	TP24_0.5-0.6	TP25_0.0-0.1	QC100	QC200	TP25_0.9-1.0
					0.0-0.1	0.5-0.6	0.0-0.1	0.9-1.0	0.2-0.3	0.5-0.6	0.5-0.6	0.9-1.0	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1	0.0-0.1	0.9-1.0
					Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Fill/Sand	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
					26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	FD	FT	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D														
Moisture																		
Moisture Content	%	1			21.4	28.5	31	12.4	44	35.3	29.8	32.8	31.3	27.1	34.8	33	29	23
Total Metals																		
Arsenic	mg/kg	5	500	3000	11	<5	8	<5	11	33	166	<5	16	<5	10	7	6	209
Cadmium	mg/kg	1	150	900	<1	<1	4	<1	10	5	4	<1	4	<1	3	2	2.4	4
Chromium	mg/kg	2	500*	3600*	8	18	8	20	12	13	19	27	13	29	9	6	7	11
Copper	mg/kg	5	30000	240000	660	60	1620	139	320	335	1330	110	1480	123	791	521	540	1060
Lead	mg/kg	5	1200	1500	415	6	239	10	48	61	489	7	191	70	243	124	130	253
Manganese	mg/kg	5	14000	60000	123	6	549	202	1580	122	164	50	475	61	296	319	360	154
Mercury	mg/kg	0.1	120**	730**	0.3	<0.1	0.2	<0.1	0.1	0.2	0.8	<0.1	0.5	<0.1	0.2	0.1	0.1	0.4
Nickel	mg/kg	2	1200	6000	5	2	10	18	24	6	7	10	9	7	12	10	9	6
Selenium	mg/kg	5	1400	10000	5	<5	<5	<5	<5	<5	<5	<5	5	<5	<5	<5	3	<5
Zinc	mg/kg	5	60000	400000	85	13	231	98	369	145	237	76	286	258	514	190	300	200

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate
* As Chromium VI ** As Mercury Inorganic

Values that exceed the investigations level are highlighted as:
Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 1999 - Amend 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 1999 - Amend 2013)

Table 1 - Soil Analytical Results - Total Metals
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location: Sample ID : Sample Depth: Sample Matrix: Sample Date: Sample Type:															Off-site Locations				BH1	
					TP26		TP27		TP28		TP29		TP30		OL1		OL2		BH1	
					TP26_0.5-0.6	TP26_1.5-1.6	TP27_0.0-0.1	TP27_0.5-0.6	TP28_0.0-0.1	TP28_0.9-1.0	TP29_0.3-0.4	TP29_0.9-1.0	TP30_0.0-0.1	TP30_0.5-0.6	OL1_0.0-0.2	OL1_0.3-0.5	OL2_0.0-0.2	OL2_0.3-0.5	BH1-0.5	BH1-1.0
					0.5-0.6	1.5-1.6	0.0-0.1	0.5-0.6	0.0-0.1	0.9-1.0	0.3-0.4	0.9-1.0	0.0-0.1	0.5-0.6	0.0-0.2	0.3-0.5	0.0-0.2	0.3-0.5	0.5	1
					Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay
					25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	09/10/2013	09/10/2013
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D																
Moisture																				
Moisture Content	%	1			25.9	22.3	30.5	29.2	41.3	30.2	21.3	25.1	33.4	35.9	23.3	25	21.9	30.8	29.2	19
Total Metals																				
Arsenic	mg/kg	5	500	3000	9	22	<5	35	26	<5	13	6	201	<5	<5	<5	32	<5	<5	<5
Cadmium	mg/kg	1	150	900	<1	2	<1	8	2	<1	13	<1	10	1	<1	<1	8	<1	<1	<1
Chromium	mg/kg	2	500*	3600*	22	17	6	12	9	14	5	17	13	21	17	21	10	20	32	11
Copper	mg/kg	5	30000	240000	132	923	262	479	2240	72	333	99	2820	249	48	66	1150	111	74	49
Lead	mg/kg	5	1200	1500	66	156	38	155	397	22	44	14	657	67	10	9	383	18	8	7
Manganese	mg/kg	5	14000	60000	121	334	231	89	442	142	20	35	296	32	24	12	148	26	19	<5
Mercury	mg/kg	0.1	120**	730**	0.1	0.1	<0.1	0.2	0.4	<0.1	0.1	<0.1	1.2	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1200	6000	5	22	8	13	12	6	7	6	11	4	3	5	12	6	6	<2
Selenium	mg/kg	5	1400	10000	<5	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	<5	<5	<5	<5	<5
Zinc	mg/kg	5	60000	400000	154	179	132	404	176	107	154	54	415	157	13	20	498	78	28	17

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate
* As Chromium VI ** As Mercury Inorganic

Values that exceed the investigations level are highlighted as:
Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 1999 - Amend 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 1999 - Amend 2013)

Table 1 - Soil Analytical Results - Total Metals
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location: Sample ID : Sample Depth: Sample Matrix: Sample Date: Sample Type:					BH2		BH3		BH4		BH5		BH6	
					BH2-0.1	BH2-1.0	BH3-0.1	BH3-1.0	BH4-0.4	BH4-1.0	BH5-0.1	BH5-1.0	BH6-0.3	BH6-1.0
					0.1	1	0.1	1	0.4	1	0.1	1	0.3	1
					Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Fill/Sand	Natural/Clay	Natural/Clay
					09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D										
Moisture														
Moisture Content	%	1			11.6	18.8	16.3	27.2	19.5	20.1	11.5	20.9	12.1	13.4
Total Metals														
Arsenic	mg/kg	5	500	3000	6	<5	37	<5	73	<5	5	11	<5	<5
Cadmium	mg/kg	1	150	900	<1	<1	3	<1	5	<1	1	<1	<1	<1
Chromium	mg/kg	2	500*	3600*	9	30	20	26	26	31	6	26	32	25
Copper	mg/kg	5	30000	240000	82	68	436	102	717	79	574	83	130	137
Lead	mg/kg	5	1200	1500	219	7	350	9	404	14	92	44	10	8
Manganese	mg/kg	5	14000	60000	92	21	147	16	248	75	161	103	550	87
Mercury	mg/kg	0.1	120**	730**	0.2	<0.1	0.2	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1200	6000	4	15	8	3	24	9	3	7	30	15
Selenium	mg/kg	5	1400	10000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc	mg/kg	5	60000	400000	1150	38	257	54	798	76	190	31	111	90

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate
* As Chromium VI ** As Mercury Inorganic

Values that exceed the investigations level are highlighted as:
Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 1999 - Amend 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 1999 - Amend 2013)

Table 2 - Soil Analytical Results - TRH and BTEXN
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location							TP1	TP2	TP3	TP4	TP5		TP6	TP7	TP8		TP9	TP10	TP11		
Sample ID (Primary):							TP1_0.0-0.1	TP2_0.2-0.4	TP3_0.0-0.1	TP4_0.0-0.1	TP5_0.5-0.6	QC102	QC202	TP6_0.2-0.3	TP7_0.3-0.4	TP8_0.0-0.1	QC101	QC102	TP9_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2
Sample Depth:							0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.5-0.6	0.5-0.6	0.5-0.6	0.2-0.3	0.3-0.4	0.0-0.1	0.0-0.1	0.0-0.1	0.3-0.4	0.0-0.1	0.1-0.2
Sample Matrix:							Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
Sample Date:							27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
Sample Type:							PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	FD	FT	PS	PS	PS
Analyte	Units	LOR	CCME_Soil-Residential - Sand - Direct Contact	CCME_Soil-Residential - Sand - Vapour Inhalation	CCME_Soil-Commercial - Sand - Direct Contact	CCME_Soil-Commercial - Sand - Vapour Inhalation															
Total Petroleum Hydrocarbons																					
C6 - C9 Fraction	mg/kg	10					<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<25	<10	<10	<10
C10 - C14 Fraction	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	-	<50	<50	<50	<50	-	<50	<50	<50	<50
Total Recoverable Hydrocarbons - NEPM 2010 Draft																					
C6 - C10 Fraction (F1)	mg/kg	10	12,000	40	19,000	320	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<25	<10	<10	<10
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<25	<10	<10	<10
>C10 - C16 Fraction (F2)	mg/kg	50	6,800	190	10,000	1,700	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
>C16 - C34 Fraction (F3)	mg/kg	100	15,000	NA	23,000	NA	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction (F4)	mg/kg	100	21,000	NA	RES	NA	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	-	<50	<50	<50	<50	-	<50	<50	<50	<50
BTEXN																					
Benzene	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
Total Xylenes	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Legend:																					
LOR - Limit of reporting							FD - Field Duplicate							- Not analysed							
PS - Primary Sample							FT - Field Triplicate							NA - Not Applicable							
RES - Residual petroleum hydrocarbon formation. Calculated value exceeds 30,000 mg/kg and solubility limit for petroleum hydrocarbon fraction.																					
Values that exceed the investigations level are highlighted as:																					
CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)																					
CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Vapour Inhalation																					
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)																					
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial Sand/coarse - Exposure Pathway Vapour Inhalation.																					

Table 2 - Soil Analytical Results - TRH and BTEXN
Phase II ESA_PKC Primary School
Golder Project No. 137623028

				Location		TP12	TP13	TP14	TP15	TP16A	TP16A	TP20	TP24	TP25		TP26	TP27	TP28	TP29
Sample ID (Primary):				TP12 0.0-0.1		TP13 0.5-0.6	TP14 0.0-0.1	TP15 0.0-0.1	TP16A 0.2-0.3	TP16A 0.5-0.6	TP20 0.5-0.6	TP24 0.5-0.6	TP25 0.0-0.1	QC100	QC200	TP26 1.5-1.6	TP27 0.5-0.6	TP28 0.0-0.1	TP29 0.3-0.4
Sample Depth:				0.0-0.1		0.5-0.6	0.0-0.1	0.0-0.1	0.2-0.3	0.5-0.6	0.5-0.6	0.5-0.6	0.0-0.1	0.0-0.1	0.0-0.1	1.5-1.6	0.5-0.6	0.0-0.1	0.3-0.4
Sample Matrix:				Fill/Sand		Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
Sample Date:				26/06/2013		26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013
Sample Type:				PS		PS	PS	PS	PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	PS
Analyte	Units	LOR	CCME Soil- Residential - Sand - Direct Contact	CCME Soil- Residential - Sand - Vapour Inhalation	CCME Soil- Commercial - Sand - Direct Contact	CCME Soil- Commercial - Sand - Vapour Inhalation													
Total Petroleum Hydrocarbons																			
C6 - C9 Fraction	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10
C10 - C14 Fraction	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	360	550	<100	<100	<100	1000
C29 - C36 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	180	240	<100	<100	<100	490
C10 - C36 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	540	790	-	<50	<50	1490
Total Recoverable Hydrocarbons - NEPM 2010 Draft																			
C6 - C10 Fraction (F1)	mg/kg	10	12,000	40	19,000	320	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10
>C10 - C16 Fraction (F2)	mg/kg	50	6,800	190	10,000	1,700	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	70
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	70
>C16 - C34 Fraction (F3)	mg/kg	100	15,000	NA	23,000	NA	<100	<100	<100	<100	<100	<100	<100	480	700	100	<100	<100	1330
>C34 - C40 Fraction (F4)	mg/kg	100	21,000	NA	RES	NA	<100	<100	<100	<100	<100	<100	<100	<100	110	<100	<100	<100	220
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	480	810	-	<50	<50	1620
BTEXN																			
Benzene	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Ethylbenzene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	0.5
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
Total Xylenes	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	0.5
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	1.1
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1

Legend:
LOR - Limit of reporting
PS - Primary Sample
FD - Field Duplicate
FT - Field Triplicate
- Not analysed
NA - Not Applicable
RES - Residual petroleum hydrocarbon formation. Calculated value exceeds 30,000 mg/kg and solubility limit for petroleum hydrocarbon fraction.

Values that exceed the investigations level are highlighted as:

CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)
CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Vapour Inhalation
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial Sand/coarse - Exposure Pathway Vapour Inhalation.

Table 2 - Soil Analytical Results - TRH and BTEXN
Phase II ESA_PKC Primary School
Golder Project No. 137623028

							Location	TP30	BH1	BH2	BH3	BH4	BH5	BH6
							Sample ID (Primary):	TP30_0.0-0.1	BH1-1.0	BH2-0.1	BH3-0.1	BH4-0.4	BH5-0.1	BH6-0.3
							Sample Depth:	0.0-0.1	1	0.1	0.1	0.4	0.1	0.3
							Sample Matrix:	Fill/Sand	Natural/Clay	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Natural/Clay
							Sample Date:	25/06/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013
							Sample Type:	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	CCME_Soil-Residential - Sand - Direct Contact	CCME_Soil-Residential - Sand - Vapour Inhalation	CCME_Soil-Commercial - Sand - Direct Contact	CCME_Soil-Commercial - Sand - Vapour Inhalation								
Total Petroleum Hydrocarbons														
C6 - C9 Fraction	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10
C10 - C14 Fraction	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	<100
C10 - C36 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50
Total Recoverable Hydrocarbons - NEPM 2010 Draft														
C6 - C10 Fraction (F1)	mg/kg	10	12,000	40	19,000	320	<10	<10	<10	<10	<10	<10	<10	<10
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10
>C10 - C16 Fraction (F2)	mg/kg	50	6,800	190	10,000	1,700	<50	<50	<50	<50	<50	<50	<50	<50
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	<50	<50
>C16 - C34 Fraction (F3)	mg/kg	100	15,000	NA	23,000	NA	<100	<100	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction (F4)	mg/kg	100	21,000	NA	RES	NA	<100	<100	<100	<100	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50
BTEXN														
Benzene	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1

Legend:
LOR - Limit of reporting FD - Field Duplicate - Not analysed
PS - Primary Sample FT - Field Triplicate NA - Not Applicable
RES - Residual petroleum hydrocarbon formation. Calculated value exceeds 30,000 mg/kg and solubility limit for petroleum hydrocarbon fraction.

Values that exceed the investigations level are highlighted as:

CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)
CCME (2008b) Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Residential - Sand/coarse - Exposure Pathway Vapour Inhalation
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial - Sand/coarse - Exposure Pathway Direct Contact (Ingestion and Dermal Contact)
CCME (2008b). Canadian Council of Ministers of the Environment, Canada Wide Standards for Petroleum Hydrocarbons - Commercial Sand/coarse - Exposure Pathway Vapour Inhalation.

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location						TP1	TP2	TP3	TP4	TP5			TP6	TP7	TP8			TP9	TP10	TP11	TP12	TP13
Sample ID (Primary):						TP1 0.0-0.1	TP2 0.2-0.4	TP3 0.0-0.1	TP4 0.0-0.1	TP5 0.5-0.6	QC102	QC202	TP6 0.2-0.3	TP7 0.3-0.4	TP8 0.0-0.1	QC101	QC102	TP9 0.3-0.4	TP10 0.0-0.1	TP11 0.1-0.2	TP12 0.0-0.1	TP13 0.5-0.6
Sample Date:						27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
Sample Type:						PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	FD	FT	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR																	
Organochlorine Pesticides (OCP)																						
alpha-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	mg/kg	0.05	15	80	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	10	50	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Sum of Aldrin + Dieldrin	mg/kg	0.05	10	45	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Total Chlordane (sum)	mg/kg	0.05	90	530	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Sum of DDD + DDE + DDT	mg/kg	0.05	600	3600	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05	20	100	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan (sum)	mg/kg	0.05	400	2000	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin ketone	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.2	500	2500	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Organophosphorus Pesticides (OPP)																						
Dichlorvos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Demeton-S-methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location						TP1	TP2	TP3	TP4	TP5			TP6	TP7	TP8			TP9	TP10	TP11	TP12	TP13
Sample ID (Primary):						TP1_0.0-0.1	TP2_0.2-0.4	TP3_0.0-0.1	TP4_0.0-0.1	TP5_0.5-0.6	QC102	QC202	TP6_0.2-0.3	TP7_0.3-0.4	TP8_0.0-0.1	QC101	QC102	TP9_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2	TP12_0.0-0.1	TP13_0.5-0.6
Sample Date:						27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
Sample Type:						PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	FD	FT	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR																	
Phenolic Compounds																						
Phenol	mg/kg	0.5	45000	240000	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	mg/kg	1			1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	-	<1	<1	<1	<1	<1
2-Nitrophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2	130	660	2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	-	<2	<2	<2	<2	<2
Polynuclear Aromatic Hydrocarbons																						
Naphthalene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	0.9	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	1.1	<0.5	<0.5	<0.5
Benzo(a)anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.8	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	0.6	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	0.6	<0.5	<0.5	<0.5
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	400	4000	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	ND	<0.5	<0.5	<0.5	<0.5	ND	<0.5	4.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	4	40	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
Ammonia																						
Ammonia as N	mg/kg	20			20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	-	<20	<20	<20	<20	<20

Legend:
LOR - Limit of reporting
PS - Primary Sample
FD - Field Duplicate
FT - Field Triplicate
-Not Analysed
Values that exceed the investigations level are highlighted as:
Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 2013)

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location					TP14	TP15	TP16A	TP16A	TP20	TP24	TP25	TP25	TP26	TP27	TP28	TP29	TP30	BH1	BH2	BH3		
Sample ID (Primary):					TP14 0.0-0.1	TP15 0.0-0.1	TP16A 0.2-0.3	TP16A 0.5-0.6	TP20 0.5-0.6	TP24 0.5-0.6	TP25 0.0-0.1	QC100	QC200	TP26 1.5-1.6	TP27 0.5-0.6	TP28 0.0-0.1	TP29 0.3-0.4	TP30 0.0-0.1	BH1-1.0	BH2-0.1	BH3-0.1	
Sample Date:					26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	09/10/2013	09/10/2013	09/10/2013	
Sample Type:					PS	PS	PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	PS	PS	PS	PS	PS	
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR																	
Organochlorine Pesticides (OCP)																						
alpha-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Hexachlorobenzene (HCB)	mg/kg	0.05	15	80	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
beta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
gamma-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
delta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor	mg/kg	0.05	10	50	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Aldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Dieldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Sum of Aldrin + Dieldrin	mg/kg	0.05	10	45	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Heptachlor epoxide	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
cis-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
trans-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Total Chlordane (sum)	mg/kg	0.05	90	530	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
alpha-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
4,4'-DDE	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
4,4'-DDD	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
4,4'-DDT	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Sum of DDD + DDE + DDT	mg/kg	0.05	600	3600	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin	mg/kg	0.05	20	100	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
beta-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan (sum)	mg/kg	0.05	400	2000	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin aldehyde	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endosulfan sulfate	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Endrin ketone	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Methoxychlor	mg/kg	0.2	500	2500	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Organophosphorus Pesticides (OPP)																						
Dichlorvos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Demeton-S-methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Monocrotophos	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	
Dimethoate	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Diazinon	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Chlorpyrifos-methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Parathion-methyl	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	
Malathion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Fenthion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Chlorpyrifos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Parathion	mg/kg	0.2			0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	
Pirimphos-ethyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Chlorfenvinphos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Bromophos-ethyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Fenamiphos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Prothiofos	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Ethion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Carbophenothion	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	
Azinphos Methyl	mg/kg	0.05			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location						TP14	TP15	TP16A	TP16A	TP20	TP24	TP25			TP26	TP27	TP28	TP29	TP30	BH1	BH2	BH3
Sample ID (Primary):						TP14 0.0-0.1	TP15 0.0-0.1	TP16A 0.2-0.3	TP16A 0.5-0.6	TP20 0.5-0.6	TP24 0.5-0.6	TP25 0.0-0.1	QC100	QC200	TP26 1.5-1.6	TP27 0.5-0.6	TP28 0.0-0.1	TP29 0.3-0.4	TP30 0.0-0.1	BH1 1.0	BH2 0.1	BH3 0.1
Sample Date:						26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	09/10/2013	09/10/2013	09/10/2013
Sample Type:						PS	PS	PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR																	
Phenolic Compounds																						
Phenol	mg/kg	0.5	45000	240000	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	mg/kg	1			1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1
2-Nitrophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2	130	660	2	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2
Polynuclear Aromatic Hydrocarbons																						
Naphthalene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	3.2	0.4	<0.5	<0.5	5.6	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.9	0.1	<0.5	<0.5	1.6	<0.5	0.9	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	1.4	0.1	<0.5	<0.5	2.7	<0.5	0.9	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.1	<0.5	<0.5	1.7	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	2	0.2	<0.5	<0.5	4.3	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	-	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.05	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	400	4000	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.3	8.7	1	<0.5	<0.5	19.7	<0.5	1.8	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	4	40	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5
Ammonia																						
Ammonia as N	mg/kg	20			20	<20	<20	<20	<20	<20	<20	<20	<20	-	<20	<20	<20	<20	<20	<20	<20	<20

Legend:
LOR - Limit of reporting
PS - Primary Sample
FD - Field Duplicate
FT - Field Triplicate
-Not Analysed

Values that exceed the investigations level are highlighted as:

Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 2013)

Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 2013)

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

					Location	BH4	BH5	BH6
					Sample ID (Primary):	BH4-0.4	BH5-0.1	BH6-0.3
					Sample Date:	09/10/2013	09/10/2013	09/10/2013
					Sample Type:	PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR			
Organochlorine Pesticides (OCP)								
alpha-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	mg/kg	0.05	15	80	0.05	<0.05	<0.05	<0.05
beta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
gamma-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
delta-BHC	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	10	50	0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Sum of Aldrin + Dieldrin	mg/kg	0.05	10	45	0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
cis-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
trans-Chlordane	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Total Chlordane (sum)	mg/kg	0.05	90	530	0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
4,4'-DDE	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
4,4'-DDD	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
4,4'-DDT	mg/kg	0.2			0.2	<0.2	<0.2	<0.2
Sum of DDD + DDE + DDT	mg/kg	0.05	600	3600	0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05	20	100	0.05	<0.05	<0.05	<0.05
beta-Endosulfan	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Endosulfan (sum)	mg/kg	0.05	400	2000	0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Endrin ketone	mg/kg	0.05			0.05	<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.2	500	2500	0.2	<0.2	<0.2	<0.2
Organophosphorus Pesticides (OPP)								
Dichlorvos	mg/kg	0.05			0.05	-	-	-
Demeton-S-methyl	mg/kg	0.05			0.05	-	-	-
Monocrotophos	mg/kg	0.2			0.2	-	-	-
Dimethoate	mg/kg	0.05			0.05	-	-	-
Diazinon	mg/kg	0.05			0.05	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			0.05	-	-	-
Parathion-methyl	mg/kg	0.2			0.2	-	-	-
Malathion	mg/kg	0.05			0.05	-	-	-
Fenthion	mg/kg	0.05			0.05	-	-	-
Chlorpyrifos	mg/kg	0.05			0.05	-	-	-
Parathion	mg/kg	0.2			0.2	-	-	-
Pirimphos-ethyl	mg/kg	0.05			0.05	-	-	-
Chlorfenvinphos	mg/kg	0.05			0.05	-	-	-
Bromophos-ethyl	mg/kg	0.05			0.05	-	-	-
Fenamiphos	mg/kg	0.05			0.05	-	-	-
Prothiofos	mg/kg	0.05			0.05	-	-	-
Ethion	mg/kg	0.05			0.05	-	-	-
Carbophenothion	mg/kg	0.05			0.05	-	-	-
Azinphos Methyl	mg/kg	0.05			0.05	-	-	-

Table 3 - Soil Analytical Results - OCPs, Phenols & PAHs
Phase II ESA_PKC Primary School
Golder Project No. 137623028

					Location		
Sample ID (Primary):					BH4-0.4	BH5-0.1	BH6-0.3
Sample Date:					09/10/2013	09/10/2013	09/10/2013
Sample Type:					PS	PS	PS
Analyte	Units	LOR	NEPM - HIL B	NEPM - HIL D	LOR		
Phenolic Compounds							
Phenol	mg/kg	0.5	45000	240000	0.5	<0.5	<0.5
2-Chlorophenol	mg/kg	0.5			0.5	<0.5	<0.5
2-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5
3- & 4-Methylphenol	mg/kg	1			1	<1	<1
2-Nitrophenol	mg/kg	0.5			0.5	<0.5	<0.5
2,4-Dimethylphenol	mg/kg	0.5			0.5	<0.5	<0.5
2,4-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5
2,6-Dichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	mg/kg	0.5			0.5	<0.5	<0.5
2,4,6-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5
2,4,5-Trichlorophenol	mg/kg	0.5			0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2	130	660	2	<2	<2
Polynuclear Aromatic Hydrocarbons							
Naphthalene	mg/kg	0.5			0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5			0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.5			0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.5	<0.5	<0.5
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	400	4000	0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	4	40	0.5	<0.5	<0.5
Ammonia							
Ammonia as N	mg/kg	20			20	<20	<20

Legend:
LOR - Limit of reporting FD - Field Duplicate -Not Analysed
PS - Primary Sample FT - Field Triplicate

Values that exceed the investigations level are highlighted as:

Health Based Investigation Level - NEPM - HILs B - Residential with minimal opportunity for soil access (NEPM 2013)
Health Based Investigation Level - NEPM - HILs D - Commercial / Industrial (NEPM 2013)

Tables 4a & 4b - Soil Analytical Results - Organics for EILs purposes
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Sample Matrix: Sample ID (Primary): Sample Depth: Sample Date:			Sand								Geometric Mean
			TP1_0.0-0.1	TP8_0.0-0.1	TP10_0.0-0.1	TP14_0.0-0.1	TP20_0.5-0.6	TP24_0.5-0.6	TP25_0.0-0.1	TP29_0.3-0.4	
			0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.5-0.6	0.5-0.6	0.0-0.1	0.3-0.4	
			27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	
Analyte	Units	LOR									
pH											
pH Value	pH Unit	0.1	6.1	5.7	6.8	4.4	4.8	5	5.6	6.3	5.59
Soil Classification based on Particle Size											
Clay (<2 µm)	%	1	13	18	24	10	29	47	12	11	20.50
Exchangeable Cations											
Exchangeable Calcium	meq/100g	0.1	9.9	7.2	21.7	0.8	7.7	3.8	2.6	1.2	6.86
Exchangeable Magnesium	meq/100g	0.1	2.6	2	1.7	0.2	2.1	8.3	0.8	1.1	2.35
Exchangeable Potassium	meq/100g	0.1	0.3	0.4	0.7	<0.1	0.3	0.1	0.1	<0.1	0.32
Exchangeable Sodium	meq/100g	0.1	0.2	0.3	0.2	<0.1	0.2	1.1	0.1	0.2	0.33
Cation Exchange Capacity	meq/100g	0.1	13	10	24.3	1.1	10.4	13.3	3.6	2.5	9.78
Organic Matter											
Organic Matter	%	0.5	3.8	5.1	5.5	1.5	2.7	1.3	5.8	2.5	3.53
Total Organic Carbon	%	0.5	2.2	3	3.2	0.9	1.6	0.8	3.4	1.4	2.06
Iron											
Iron	mg/kg		20300	38500	34800	12000	31700	56900	12000	15500	27713

Legend:

LOR - Limit of reporting

Sample Matrix: Sample ID (Primary): Sample Depth: Sample Date:			Clay								Geometric Mean
			TP9_0.5-0.6	TP3_0.5-0.6	TP5_0.9-1.0	TP7_0.5-0.6	TP11_0.9-1.0	TP15_0.9-1.0	TP28_0.9-1.0		
			0.5-0.6	0.5-0.6	0.9-1.0	0.5-0.6	0.9-1.0	0.9-1.0	0.9-1.0		
			26/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	25/06/2013		
Analyte	Units	LOR									
pH											
pH Value	pH Unit	0.1	5.1	5.2	5.3	6.9	6.2	5.1	7	5.83	
Soil Classification based on Particle Size											
Clay (<2 µm)	%	1	60	54	43	60	22	18	48	43.57	
Exchangeable Cations											
Exchangeable Calcium	meq/100g	0.1	11.2	3.6	2.5	17.5	0.7	1.2	15.1	7.40	
Exchangeable Magnesium	meq/100g	0.1	12.2	9.1	11.6	10.5	12.6	11.7	9.7	11.06	
Exchangeable Potassium	meq/100g	0.1	0.3	0.2	0.2	0.1	<0.1	0.2	0.2	0.20	
Exchangeable Sodium	meq/100g	0.1	1.8	2.9	1.1	1.7	6.3	0.6	0.8	2.17	
Cation Exchange Capacity	meq/100g	0.1	25.4	15.8	15.4	29.9	19.7	13.7	25.9	20.83	
Organic Matter											
Organic Matter	%	0.5	1.2	1.9	1	1.8	0.6	<0.5	1	1.25	
Total Organic Carbon	%	0.5	0.7	1.1	0.6	1.1	<0.5	<0.5	0.6	0.82	
Iron											
Iron	mg/kg		42400	59000	33500	59200	22800	50100	42200	44171	

Legend:

LOR - Limit of reporting

Table 5 - Soil Analytical Results - Nutrients
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location Sample ID (Primary): Sample Date: Sample Type:			TP20	TP26		BH4	
			TP20_0.5-0.6	TP26_0.5-0.6	TP26_1.5-1.6	BH4-0.4	BH4-1.0
			26/06/2013	25/06/2013	25/06/2013	09/10/2013	09/10/2013
			PS	PS	PS	PS	PS
Analyte	Units	LOR					
Nutrients							
Ammonia as N	mg/kg	20	<20	<20	<20	<20	30
Nitrite as N (Sol.)	mg/kg	0.1	<1.0	<1.0	<0.1	<1.0	<1.0
Nitrate as N (Sol.)	mg/kg	0.1	<1.0	<1.0	<0.1	<1.0	<1.0
Nitrite + Nitrate as N (Sol.)	mg/kg	0.1	<1.0	<1.0	<0.1	<1.0	<1.0
Total Kjeldahl Nitrogen as N	mg/kg	20	1590	1040	470	120	880
Total Nitrogen as N	mg/kg	20	1590	1040	470	120	880
Total Phosphorus as P	mg/kg	2	667	261	888	338	186

Legend:

LOR - Limit of reporting

FD - Field Duplicate

PS - Primary Sample

FT - Field Triplicate

Table 6 - Asbestos Analytical Results
Phase II ESA_PKC Primary School
Golder Project No. 137623028

					Location:	TP3_0.0-0.1	TP7_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2	TP12_0.0-0.1
					Sample ID:	TP3_0.0-0.1	TP7_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2	TP12_0.0-0.1
					Sample Date:	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013
Analyte	Units	LOR	NEPM - Health Screening Level - Residential B	NEPM - Health Screening Level - Residential D						
Identification of Asbestos in bulk samples										
Asbestos Detected	-	-			No	No	Yes	Yes	No	
Asbestos detected in surface soil (0.1m)	-	-	No visible	No visible	No	No	Yes	NA	No	
Asbestos Type	-	-					Ch	Ch + Am	-	
Sample weight (dry)	g	0.01			599	7320	6290	9040	7660	
Description	-	1			Dark grey-brown clay soil with some small grey rocks plus some vegetation	Dark grey-brown clay soil with some small red rocks plus some vegetation	Mid brown clay soil with some grey rocks plus some concrete debris and plenty of pieces of bonded asbestos vinyl tile like material approx 40 x 25 x 3mm and several small friable asbestos fibre bundles approx 4 x 1 x 1mm	Mid brown clay soil with some concrete debris plus some slag grains and two small fragments of bonded asbestos cement sheeting approx 6 x 4 x 3mm	Mid grey-brown clay soil with some quartz and slag grains and plenty of vegetation	
APPROVED IDENTIFIER:	-	1			C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	
Asbestos Quantification (non-NATA)										
Weight Used for % Calculation	kg	0.0001			6	7.32	6.29	9.04	7.66	
Asbestos Containing Material (ACM)	g	0.1			<0.1	<0.1	64.6	<0.1	<0.1	
Fibrous Asbestos (FA)	g	0.002			<0.002	<0.002	0.008	0.007	<0.002	
Asbestos Fines (AF)	-	-			No	No	Yes	Yes	No	
Asbestos Containing Material (ACM >7mm)	%	0.01	0.04	0.05	<0.01	<0.01	0.10	<0.01	<0.01	
Asbestos Fines and Fibrous Asbestos (<7mm)	%	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	

Legend:

LOR - Limit of reporting

w/w - weight for weight

Asbestos Identification:

Am - Amosite (brown asbestos)

Cr - Crocidolite (blue asbestos)

Ch - Chrysotile (white asbestos)

Values that exceed the investigations level are highlighted as:

Health Screening Levels for Asbestos Contamination in Soil - Residential B - (NEPM 1999 - Amend 2013)
Health Screening Levels for Asbestos Contamination in Soil - Commercial/Industrial D - (NEPM 1999 - Amend 2013)

Table 6 - Asbestos Analytical Results
Phase II ESA_PKC Primary School
Golder Project No. 137623028

					Location:	TP12A_0.1-0.2	TP15_0.0-0.1	TP16A_0.9-1.0	TP16B_0.1-0.2	TP20_0.5-0.6
					Sample ID:	TP12A_0.1-0.2	TP15_0.0-0.1	TP16A_0.9-1.0	TP16B_0.1-0.2	TP20_0.5-0.6
					Sample Date:	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
Analyte	Units	LOR	NEPM - Health Screening Level - Residential B	NEPM - Health Screening Level - Residential D						
Identification of Asbestos in bulk samples										
Asbestos Detected	-	-			Yes	Yes	Yes	Yes	Yes	Yes
Asbestos detected in surface soil (0.1m)	-	-	No visible	No visible	NA	Yes	NA	NA	NA	NA
Asbestos Type	-	-			Ch + Am	Ch + Am	Ch + Am	Ch + Am + Cr	Ch	Ch
Sample weight (dry)	g	0.01			27.1	6390	86.3	28.5	7840	
Description	-	1			One piece of bonded asbestos cement sheeting approx 90 x 39 x 5mm	Mid brown clay soil with some slag grains plus plenty of vegetation and one small piece of degraded and friable asbestos fibre board approx 6 x 5 x 3mm	Three pieces of bonded asbestos cement sheeting approx 118 x 40 x 5mm	Several pieces of bonded asbestos cement sheeting approx 45 x 30 x 5mm	Mid grey-brown clay soil with some grey rocks plus some glass debris and several small friable fragments of asbestos fibre board approx 5 x 5 x 2mm	
APPROVED IDENTIFIER:	-	1			C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER	C.OWLER
Asbestos Quantification (non-NATA)										
Weight Used for % Calculation	kg	0.0001			-	6.39	-	-	7.84	
Asbestos Containing Material (ACM)	g	0.1			-	<0.1	-	-	<0.1	
Fibrous Asbestos (FA)	g	0.002			-	0.004	-	-	0.023	
Asbestos Fines (AF)	-	-			-	Yes	-	-	Yes	
Asbestos Containing Material (ACM >7mm)	%	0.01	0.04	0.05	-	<0.01	-	-	<0.01	
Asbestos Fines and Fibrous Asbestos (<7mm)	%	0.001	0.001	0.001	-	<0.001	-	-	0.001	

Legend:

LOR - Limit of reporting

w/w - weight for weight

Asbestos Identification:

Am - Amosite (brown asbestos)

Cr - Crocidolite (blue asbestos)

Ch - Chrysotile (white asbestos)

Values that exceed the investigations level are highlighted as:

Health Screening Levels for Asbestos Contamination in Soil - Residential B - (NEPM 1999 - Amend 2013)
Health Screening Levels for Asbestos Contamination in Soil - Commercial/Industrial D - (NEPM 1999 - Amend 2013)

Table 7a - QAQC Analytical Results - Rinsate Blanks
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location:			Rinsate Blank	Rinsate Blank	Rinsate Blank
Sample ID :			QC300	QC301	QC302
Sample Date:			25/06/2013	26/06/2013	27/06/2013
Analyte	Units	LOR			
BTEXN					
Benzene	µg/L	1	<1	<1	<1
Toluene	µg/L	2	<2	<2	<2
Ethylbenzene	µg/L	2	<2	<2	<2
meta- & para-Xylene	µg/L	2	<2	<2	<2
ortho-Xylene	µg/L	2	<2	<2	<2
Total Xylenes	µg/L	2	<2	<2	<2
Sum of BTEX	µg/L	1	<1	<1	<1
Naphthalene	µg/L	5	<5	<5	<5
Total Petroleum Hydrocarbons					
C6 - C9 Fraction	µg/L	20	<20	<20	<20
C10 - C14 Fraction	µg/L	50	<50	<50	<50
C15 - C28 Fraction	µg/L	100	<100	<100	<100
C29 - C36 Fraction	µg/L	50	<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	50	<50	<50	<50
Total Recoverable Hydrocarbons - NEPM 2010 Draft					
C6 - C10 Fraction	µg/L	20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	20	<20	<20	<20
>C10 - C16 Fraction	µg/L	100	<100	<100	<100
>C16 - C34 Fraction	µg/L	100	<100	<100	<100
>C34 - C40 Fraction	µg/L	100	<100	<100	<100
>C10 - C40 Fraction (sum)	µg/L	100	<100	<100	<100
Total Metals					
Arsenic	mg/L	0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001	<0.001	<0.001	<0.001
Copper	mg/L	0.001	<0.001	<0.001	<0.001
Lead	mg/L	0.001	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	<0.001	<0.001	<0.001
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001
Nickel	mg/L	0.001	<0.001	<0.001	<0.001
Selenium	mg/L	0.01	<0.01	<0.01	<0.01
Zinc	mg/L	0.005	<0.005	<0.005	<0.005
Organochlorine Pesticides (OC)					
alpha-BHC	µg/L	0.5	<0.5	<0.5	<0.5
Hexachlorobenzene (HCB)	µg/L	0.5	<0.5	<0.5	<0.5
beta-BHC	µg/L	0.5	<0.5	<0.5	<0.5
gamma-BHC	µg/L	0.5	<0.5	<0.5	<0.5
delta-BHC	µg/L	0.5	<0.5	<0.5	<0.5
Heptachlor	µg/L	0.5	<0.5	<0.5	<0.5
Aldrin	µg/L	0.5	<0.5	<0.5	<0.5
Heptachlor epoxide	µg/L	0.5	<0.5	<0.5	<0.5
trans-Chlordane	µg/L	0.5	<0.5	<0.5	<0.5
alpha-Endosulfan	µg/L	0.5	<0.5	<0.5	<0.5
cis-Chlordane	µg/L	0.5	<0.5	<0.5	<0.5
Dieldrin	µg/L	0.5	<0.5	<0.5	<0.5
4,4'-DDE	µg/L	0.5	<0.5	<0.5	<0.5
Endrin	µg/L	0.5	<0.5	<0.5	<0.5
beta-Endosulfan	µg/L	0.5	<0.5	<0.5	<0.5
4,4'-DDD	µg/L	0.5	<0.5	<0.5	<0.5
Endrin aldehyde	µg/L	0.5	<0.5	<0.5	<0.5
Endosulfan sulfate	µg/L	0.5	<0.5	<0.5	<0.5
4,4'-DDT	µg/L	2	<2.0	<2.0	<2.0
Endrin ketone	µg/L	0.5	<0.5	<0.5	<0.5
Methoxychlor	µg/L	2	<2.0	<2.0	<2.0
Total Chlordane (sum)	µg/L	0.5	<0.5	<0.5	<0.5
Sum of DDD + DDE + DDT	µg/L	0.5	<0.5	<0.5	<0.5
Sum of Aldrin + Dieldrin	µg/L	0.5	<0.5	<0.5	<0.5

Table 7a - QAQC Analytical Results - Rinsate Blanks
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Location:			Rinsate Blank	Rinsate Blank	Rinsate Blank
Sample ID :			QC300	QC301	QC302
Sample Date:			25/06/2013	26/06/2013	27/06/2013
Analyte	Units	LOR			
Organophosphorus Pesticides (OP)					
Dichlorvos	µg/L	0.5	<0.5	<0.5	<0.5
Demeton-S-methyl	µg/L	0.5	<0.5	<0.5	<0.5
Monocrotophos	µg/L	2	<2.0	<2.0	<2.0
Dimethoate	µg/L	0.5	<0.5	<0.5	<0.5
Diazinon	µg/L	0.5	<0.5	<0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.5	<0.5	<0.5	<0.5
Parathion-methyl	µg/L	2	<2.0	<2.0	<2.0
Malathion	µg/L	0.5	<0.5	<0.5	<0.5
Fenthion	µg/L	0.5	<0.5	<0.5	<0.5
Chlorpyrifos	µg/L	0.5	<0.5	<0.5	<0.5
Parathion	µg/L	2	<2.0	<2.0	<2.0
Pirimphos-ethyl	µg/L	0.5	<0.5	<0.5	<0.5
Chlorfenvinphos	µg/L	0.5	<0.5	<0.5	<0.5
Bromophos-ethyl	µg/L	0.5	<0.5	<0.5	<0.5
Fenamiphos	µg/L	0.5	<0.5	<0.5	<0.5
Prothiofos	µg/L	0.5	<0.5	<0.5	<0.5
Ethion	µg/L	0.5	<0.5	<0.5	<0.5
Carbophenothion	µg/L	0.5	<0.5	<0.5	<0.5
Azinphos Methyl	µg/L	0.5	<0.5	<0.5	<0.5
Phenolic Compounds					
Phenol	µg/L	1	<1.0	<1.0	<1.0
2-Chlorophenol	µg/L	1	<1.0	<1.0	<1.0
2-Methylphenol	µg/L	1	<1.0	<1.0	<1.0
3- & 4-Methylphenol	µg/L	2	<2.0	<2.0	<2.0
2-Nitrophenol	µg/L	1	<1.0	<1.0	<1.0
2,4-Dimethylphenol	µg/L	1	<1.0	<1.0	<1.0
2,4-Dichlorophenol	µg/L	1	<1.0	<1.0	<1.0
2,6-Dichlorophenol	µg/L	1	<1.0	<1.0	<1.0
4-Chloro-3-Methylphenol	µg/L	1	<1.0	<1.0	<1.0
2,4,6-Trichlorophenol	µg/L	1	<1.0	<1.0	<1.0
2,4,5-Trichlorophenol	µg/L	1	<1.0	<1.0	<1.0
Pentachlorophenol	µg/L	2	<2.0	<2.0	<2.0
Polynuclear Aromatic Hydrocarbons					
Naphthalene	µg/L	1	<1.0	<1.0	<1.0
Acenaphthylene	µg/L	1	<1.0	<1.0	<1.0
Acenaphthene	µg/L	1	<1.0	<1.0	<1.0
Fluorene	µg/L	1	<1.0	<1.0	<1.0
Phenanthrene	µg/L	1	<1.0	<1.0	<1.0
Anthracene	µg/L	1	<1.0	<1.0	<1.0
Fluoranthene	µg/L	1	<1.0	<1.0	<1.0
Pyrene	µg/L	1	<1.0	<1.0	<1.0
Benz(a)anthracene	µg/L	1	<1.0	<1.0	<1.0
Chrysene	µg/L	1	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L	1	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L	1	<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L	0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	µg/L	1	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	<1.0
Sum of polycyclic aromatic hydrocarbons	µg/L	0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	µg/L	0.5	<0.5	<0.5	<0.5

Legend:

LOR - Limit of reporting

Table 7b - QAQC Analytical Results - Trip Blanks
Phase II ESA_PKC Primary School
Golder Project No. 137623028

			Location: Sample ID :	Trip Blank QC400	Trip Blank QC401	Trip Blank QC402
			Sample Date:	25/06/2013	26/06/2013	27/06/2013
Moisture						
Moisture Content (dried @ 103°C)	%	1		21.5	5.5	2.8
BTEXN						
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
meta- & para-Xylene	mg/kg	0.5		<0.5	<0.5	<0.5
ortho-Xylene	mg/kg	0.5		<0.5	<0.5	<0.5
Total Xylenes	mg/kg	0.5		<0.5	<0.5	<0.5
Sum of BTEX	mg/kg	0.2		<0.2	<0.2	<0.2
Naphthalene	mg/kg	1		<1	<1	<1
Total Petroleum Hydrocarbons						
C6 - C9 Fraction	mg/kg	10		<10	<10	<10
C10 - C14 Fraction	mg/kg	50		<50	<50	<50
C15 - C28 Fraction	mg/kg	100		<100	<100	<100
C29 - C36 Fraction	mg/kg	100		<100	<100	<100
C10 - C36 Fraction (sum)	mg/kg	50		<50	<50	<50
Total Recoverable Hydrocarbons - NEPM 2010 Draft						
C6 - C10 Fraction	mg/kg	10		<10	<10	<10
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10		<10	<10	<10
>C10 - C16 Fraction	mg/kg	50		<50	<50	<50
>C16 - C34 Fraction	mg/kg	100		<100	<100	<100
>C34 - C40 Fraction	mg/kg	100		<100	<100	<100
>C10 - C40 Fraction (sum)	mg/kg	50		<50	<50	<50
Total Metals						
Arsenic	mg/kg	5		<5	<5	<5
Cadmium	mg/kg	1		<1	<1	<1
Chromium	mg/kg	2		<2	<2	<2
Copper	mg/kg	5		<5	<5	<5
Iron	mg/kg	50		-	-	-
Lead	mg/kg	5		<5	<5	<5
Manganese	mg/kg	5		10	12	8
Mercury	mg/kg	0.1		<0.1	<0.1	<0.1
Nickel	mg/kg	2		<2	<2	<2
Selenium	mg/kg	5		<5	<5	<5
Zinc	mg/kg	5		<5	<5	<5
Ammonia						
Ammonia as N	mg/kg	20		<20	<20	<20
Organochlorine Pesticides (OC)						
alpha-BHC	mg/kg	0.05		<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	mg/kg	0.05		<0.05	<0.05	<0.05
beta-BHC	mg/kg	0.05		<0.05	<0.05	<0.05
gamma-BHC	mg/kg	0.05		<0.05	<0.05	<0.05
delta-BHC	mg/kg	0.05		<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05		<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05		<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05		<0.05	<0.05	<0.05
Total Chlordane (sum)	mg/kg	0.05		<0.05	<0.05	<0.05
trans-Chlordane	mg/kg	0.05		<0.05	<0.05	<0.05
alpha-Endosulfan	mg/kg	0.05		<0.05	<0.05	<0.05
cis-Chlordane	mg/kg	0.05		<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05		<0.05	<0.05	<0.05
4,4'-DDE	mg/kg	0.05		<0.05	<0.05	<0.05
Endrin	mg/kg	0.05		<0.05	<0.05	<0.05
beta-Endosulfan	mg/kg	0.05		<0.05	<0.05	<0.05
Endosulfan (sum)	mg/kg	0.05		<0.05	<0.05	<0.05
4,4'-DDD	mg/kg	0.05		<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05		<0.05	<0.05	<0.05
Endosulfan sulfate	mg/kg	0.05		<0.05	<0.05	<0.05
4,4'-DDT	mg/kg	0.2		<0.2	<0.2	<0.2
Endrin ketone	mg/kg	0.05		<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.2		<0.2	<0.2	<0.2
Sum of Aldrin + Dieldrin	mg/kg	0.05		<0.05	<0.05	<0.05
Sum of DDD + DDE + DDT	mg/kg	0.05		<0.05	<0.05	<0.05

Table 7b - QAQC Analytical Results - Trip Blanks
Phase II ESA_PKC Primary School
Golder Project No. 137623028

			Location:	Trip Blank	Trip Blank	Trip Blank
			Sample ID :	QC400	QC401	QC402
			Sample Date:	25/06/2013	26/06/2013	27/06/2013
Organophosphorus Pesticides (OP)						
Dichlorvos	mg/kg	0.05		<0.05	<0.05	<0.05
Demeton-S-methyl	mg/kg	0.05		<0.05	<0.05	<0.05
Monocrotophos	mg/kg	0.2		<0.2	<0.2	<0.2
Dimethoate	mg/kg	0.05		<0.05	<0.05	<0.05
Diazinon	mg/kg	0.05		<0.05	<0.05	<0.05
Chlorpyrifos-methyl	mg/kg	0.05		<0.05	<0.05	<0.05
Parathion-methyl	mg/kg	0.2		<0.2	<0.2	<0.2
Malathion	mg/kg	0.05		<0.05	<0.05	<0.05
Fenthion	mg/kg	0.05		<0.05	<0.05	<0.05
Chlorpyrifos	mg/kg	0.05		<0.05	<0.05	<0.05
Parathion	mg/kg	0.2		<0.2	<0.2	<0.2
Pirimphos-ethyl	mg/kg	0.05		<0.05	<0.05	<0.05
Chlorfenvinphos	mg/kg	0.05		<0.05	<0.05	<0.05
Bromophos-ethyl	mg/kg	0.05		<0.05	<0.05	<0.05
Fenamiphos	mg/kg	0.05		<0.05	<0.05	<0.05
Prothiofos	mg/kg	0.05		<0.05	<0.05	<0.05
Ethion	mg/kg	0.05		<0.05	<0.05	<0.05
Carbophenothion	mg/kg	0.05		<0.05	<0.05	<0.05
Azinphos Methyl	mg/kg	0.05		<0.05	<0.05	<0.05
Phenolic Compounds						
Phenol	mg/kg	0.5		<0.5	<0.5	<0.5
2-Chlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5
2-Methylphenol	mg/kg	0.5		<0.5	<0.5	<0.5
3- & 4-Methylphenol	mg/kg	1		<1	<1	<1
2-Nitrophenol	mg/kg	0.5		<0.5	<0.5	<0.5
2,4-Dimethylphenol	mg/kg	0.5		<0.5	<0.5	<0.5
2,4-Dichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5
2,6-Dichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	mg/kg	0.5		<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2		<2	<2	<2
Polynuclear Aromatic Hydrocarbons						
Naphthalene	mg/kg	0.5		<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5		<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5		<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5		<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5		<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5		<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5		<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5		<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5		<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5		<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5		<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5		<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.5		<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	mg/kg	0.5		<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5		<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5		<0.5	<0.5	<0.5
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5		<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5		<0.5	<0.5	<0.5

Legend:

LOR - Limit of reporting

- Not Analysed

Table 8 - Ecological Screening Levels (ESL) and Management Limits (MLs)
Phase II ESA_PKC Primary School
Golder Project No. 137623028

			Location	TP1	TP2	TP3	TP4	TP5			TP6	TP7	TP8			TP9	TP10	TP11	
			Sample ID (Primary):	TP1_0.0-0.1	TP2_0.2-0.4	TP3_0.0-0.1	TP4_0.0-0.1	TP5_0.5-0.6	QC102	QC202	TP6_0.2-0.3	TP7_0.3-0.4	TP8_0.0-0.1	QC101	QC102	TP9_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2	
			Sample Depth:	0.0-0.1	0.2-0.4	0.0-0.1	0.0-0.1	0.5-0.6	0.5-0.6	0.5-0.6	0.2-0.3	0.3-0.4	0.0-0.1	0.0-0.1	0.0-0.1	0.3-0.4	0.0-0.1	0.1-0.2	
			Sample Matrix:	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	
			Sample Date:	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	
			Sample Type:	PS	PS	PS	PS	PS	FD	FT	PS	PS	PS	FD	FT	PS	PS	PS	
			ECOLOGICAL SCREENING LEVELS (ESL)	MANAGEMENT LIMITS (MLs)															
			Urban Residential (Coarse)	Commercial / Industrial (Coarse)	Urban Residential (Coarse)	Commercial / Industrial (Coarse)													
Analyte	Units	LOR																	
Total Petroleum Hydrocarbons																			
C6 - C9 Fraction	mg/kg	10																	
C10 - C14 Fraction	mg/kg	50																	
C15 - C28 Fraction	mg/kg	100																	
C29 - C36 Fraction	mg/kg	100																	
C10 - C36 Fraction (sum)	mg/kg	50																	
Total Recoverable Hydrocarbons - NEPM 2010 Draft																			
C6 - C10 Fraction (F1)	mg/kg	10	180	215	700	700	<10	<10	<10	<10	<25	<10	<10	<10	<25	<10	<10	<10	
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<25	<10	<10	<10	<25	<10	<10	<10	
>C10 - C16 Fraction (F2)	mg/kg	50	120	170	1000	1000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
>C16 - C34 Fraction (F3)	mg/kg	100	300	1700	2500	3500	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C34 - C40 Fraction (F4)	mg/kg	100	2800	3300	10000	10000	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	-	<50	<50	<50	<50	-	<50	<50	
BTEXN																			
Benzene	mg/kg	0.2	50	75	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	mg/kg	0.5	85	135	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	mg/kg	0.5	70	165	-	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	
Total Xylenes	mg/kg	0.5	105	180	-	-	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Polynuclear Aromatic Hydrocarbons																			
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	1.4	1.4	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	

Legend:
LOR - Limit of reporting
PS - Primary Sample
FD - Field Duplicate
FT - Field Triplicate
- Not analysed / Not guideline available

Values for ESL - Urban Residential - Open Space (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for ESL - Commercial/Industrial (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for Management Limits - Urban Residential (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013
Management Limits - Commercial / Industrial (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013

Table 8 - Ecological Screening Levels (ESL) and Management Limits (MLs)
Phase II ESA_PKC Primary School
Golder Project No. 137623028

			Location	TP12	TP13	TP14	TP15	TP16A	TP16A	TP20	TP24	TP25			TP26	TP27	TP28
			Sample ID (Primary):	TP12 0.0-0.1	TP13 0.5-0.6	TP14 0.0-0.1	TP15 0.0-0.1	TP16A 0.2-0.3	TP16A 0.5-0.6	TP20 0.5-0.6	TP24 0.5-0.6	TP25 0.0-0.1	QC100	QC200	TP26 1.5-1.6	TP27 0.5-0.6	TP28 0.0-0.1
			Sample Depth:	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1	0.2-0.3	0.5-0.6	0.5-0.6	0.5-0.6	0.0-0.1	0.0-0.1	0.0-0.1	1.5-1.6	0.5-0.6	0.0-0.1
			Sample Matrix:	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
			Sample Date:	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	25/06/2013	25/06/2013
			Sample Type:	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	FD	FT	PS	PS
			ECOLOGICAL SCREENING LEVELS (ESL)		MANAGEMENT LIMITS (MLs)												
Analyte	Units	LOR	Urban Residential (Coarse)	Commercial / Industrial (Coarse)	Urban Residential (Coarse)	Commercial / Industrial (Coarse)											
Total Petroleum Hydrocarbons																	
C6 - C9 Fraction	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10
C10 - C14 Fraction	mg/kg	50					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	360	550	<100	1000
C29 - C36 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	<100	180	240	<100	490
C10 - C36 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	540	790	-	<50	1490
Total Recoverable Hydrocarbons - NEPM 2010 Draft																	
C6 - C10 Fraction (F1)	mg/kg	10	180	215	700	700	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10
>C10 - C16 Fraction (F2)	mg/kg	50	120	170	1000	1000	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	70
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	70
>C16 - C34 Fraction (F3)	mg/kg	100	300	1700	2500	3500	<100	<100	<100	<100	<100	<100	480	700	100	<100	1330
>C34 - C40 Fraction (F4)	mg/kg	100	2800	3300	10000	10000	<100	<100	<100	<100	<100	<100	<100	110	<100	<100	220
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	480	810	-	<50	1620
BTEXN																	
Benzene	mg/kg	0.2	50	75	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.5	85	135	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Ethylbenzene	mg/kg	0.5	70	165	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	0.5
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5
Total Xylenes	mg/kg	0.5	105	180	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	0.5
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	1.1
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Polynuclear Aromatic Hydrocarbons																	
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	1.4	1.4	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1

Legend:
LOR - Limit of reporting
PS - Primary Sample
- Not analysed / Not guideline available
FD - Field Duplicate
FT - Field Triplicate

Values for ESL - Urban Residential - Open Space (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for ESL - Commercial/Industrial (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for Management Limits - Urban Residential (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013
Management Limits - Commercial / Industrial (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013

Table 8 - Ecological Screening Levels (ESL) and Management Limits (MLs)
Phase II ESA_PKC Primary School
Golder Project No. 137623028

							Location	TP29	TP30	BH2	BH3	BH4	BH5
							Sample ID (Primary):	TP29_0.3-0.4	TP30_0.0-0.1	BH2-0.1	BH3-0.1	BH4-0.4	BH5-0.1
							Sample Depth:	0.3-0.4	0.0-0.1	0.1	0.1	0.4	0.1
							Sample Matrix:	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
							Sample Date:	25/06/2013	25/06/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013
							Sample Type:	PS	PS	PS	PS	PS	PS
			ECOLOGICAL SCREENING LEVELS (ESL)		MANAGEMENT LIMITS (MLs)								
Analyte	Units	LOR	Urban Residential (Coarse)	Commercial / Industrial (Coarse)	Urban Residential (Coarse)	Commercial / Industrial (Coarse)							
Total Petroleum Hydrocarbons													
C6 - C9 Fraction	mg/kg	10					<10	<10	<10	<10	<10	<10	
C10 - C14 Fraction	mg/kg	50					<50	<50	<50	<50	<50	<50	
C15 - C28 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	
C29 - C36 Fraction	mg/kg	100					<100	<100	<100	<100	<100	<100	
C10 - C36 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	
Total Recoverable Hydrocarbons - NEPM 2010 Draft													
C6 - C10 Fraction (F1)	mg/kg	10	180	215	700	700	<10	<10	<10	<10	<10	<10	
C6 - C10 Fraction minus BTEX	mg/kg	10					<10	<10	<10	<10	<10	<10	
>C10 - C16 Fraction (F2)	mg/kg	50	120	170	1000	1000	<50	<50	<50	<50	<50	<50	
C10 - C16 Fraction minus Napht	mg/kg	calc.					<50	<50	<50	<50	<50	<50	
>C16 - C34 Fraction (F3)	mg/kg	100	300	1700	2500	3500	<100	<100	<100	<100	<100	<100	
>C34 - C40 Fraction (F4)	mg/kg	100	2800	3300	10000	10000	<100	<100	<100	<100	<100	<100	
>C10 - C40 Fraction (sum)	mg/kg	50					<50	<50	<50	<50	<50	<50	
BTEXN													
Benzene	mg/kg	0.2	50	75	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Toluene	mg/kg	0.5	85	135	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	mg/kg	0.5	70	165	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
meta- & para-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
ortho-Xylene	mg/kg	0.5					<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Total Xylenes	mg/kg	0.5	105	180	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Sum of BTEX	mg/kg	0.2					<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Naphthalene	mg/kg	1					<1	<1	<1	<1	<1	<1	
Polynuclear Aromatic Hydrocarbons													
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	1.4	1.4	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	

Legend:
LOR - Limit of reporting
PS - Primary Sample
- Not analysed / Not guideline available
FD - Field Duplicate
FT - Field Triplicate

Values for ESL - Urban Residential - Open Space (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for ESL - Commercial/Industrial (coarse) were obtained from Table 1B (6) in the NEPM 1999 - Amend 2013
Values for Management Limits - Urban Residential (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013
Management Limits - Commercial / Industrial (Coarse) were obtained from Table 1B (7) in the NEPM 1999 - Amend 2013

Table 9 - Ecological Investigation Levels (EIL) for the Site
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Fill / Sand material

Location:					TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11	TP12	TP13	TP14	TP15	TP16A	
Sample ID :					TP1_0.0-0.1	TP2_0.0-0.1	TP3_0.0-0.1	TP4_0.0-0.1	TP5_0.5-0.6	TP6_0.2-0.3	TP7_0.3-0.4	TP8_0.0-0.1	TP9_0.3-0.4	TP10_0.0-0.1	TP11_0.1-0.2	TP12_0.0-0.1	TP13_0.5-0.6	TP14_0.0-0.1	TP15_0.0-0.1	TP16A_0.2-0.3	TP16A_0.5-0.6
Sample Depth:					0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.5-0.6	0.2-0.3	0.3-0.4	0.0-0.1	0.3-0.4	0.0-0.1	0.1-0.2	0.0-0.1	0.5-0.6	0.0-0.1	0.0-0.1	0.2-0.3	0.5-0.6
Sample Matrix:					Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand
Sample Date:					27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
Sample Type:					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
					PS	PS	PS	PS	PS												

Legend:
LOR - Limit of reporting -Not Analysed
Lead, arsenic and naphthalene values were obtained from Table 1B (4) and Table 1B (5).
All the other parameters were calculated as EILs (ABC + ACL)

Natural / Clay material

					Location:	TP1	TP2	TP3	TP4	TP5	TP6	TP7	TP8	TP9	TP10	TP11	TP12	TP13	TP14	TP15	TP20	TP24
					Sample ID :	TP1_0.9-1.0	TP2_0.2-0.4	TP3_0.5-0.6	TP4_0.5-0.6	TP5_0.9-1.0	TP6_0.5-0.6	TP7_0.5-0.6	TP8_0.9-1.0	TP9_0.5-0.6	TP10_0.5-0.6	TP11_0.9-1.0	TP12_0.9-1.0	TP13_1.5-1.6	TP14_0.5-0.6	TP15_0.9-1.0	TP20_0.9-1.0	TP24_0.5-0.6
					Sample Depth:	0.9-1.0	0.2-0.4	0.5-0.6	0.5-0.6	0.9-1.0	0.5-0.6	0.5-0.6	0.9-1.0	0.5-0.6	0.5-0.6	0.9-1.0	0.9-1.0	1.5-1.6	0.5-0.6	0.9-1.0	0.9-1.0	0.5-0.6
					Sample Matrix:	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay
					Sample Date:	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	27/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013	26/06/2013
					Sample Type:	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
Analyte	Units	LOR	Site EIL - Urban Residential (Fine/Clay)	Site EIL - Commercial / Industrial (Fine/Clay)																		
Total Metals																						
Arsenic	mg/kg	5	100	160	<5	<5	<5	9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Cadmium	mg/kg	1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	mg/kg	2	420	680	14	20	25	16	17	22	24	12	21	24	14	19	15	18	20	27	29	29
Copper	mg/kg	5	355	355	87	82	80	78	69	61	77	76	82	88	73	116	63	60	139	110	123	123
Lead	mg/kg	5	1100	1800	<5	7	12	22	<5	7	9	<5	10	9	6	6	6	6	10	7	70	70
Manganese	mg/kg	5			38	<5	19	21	<5	48	20	28	9	15	21	64	35	6	202	50	61	61
Mercury	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	275	465	9	3	4	3	<2	4	4	5	2	4	5	14	2	2	18	10	7	7
Selenium	mg/kg	5			<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc	mg/kg	5	435	655	33	12	25	16	15	9	24	31	17	27	38	88	21	13	98	76	258	258
Naphthalene	mg/kg	1	170	370	-	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1

Legend:
LOR - Limit of reporting -Not Analysed
Lead, arsenic and naphthalene values were obtained from Table 1B (4) and Table 1B (5).
All the other parameters were calculated as EILs (ABC + ACL)

Table 9 - Ecological Investigation Levels (EIL) for the Site
Phase II ESA_PKC Primary School
Golder Project No. 137623028

Fill / Sand material

Location:					TP20	TP24	TP25		TP26		TP27		TP28	TP29	TP30	BH2-1.0	BH3-1.0	BH4-1.0	BH5-1.0					
Sample ID :					TP20_0.5-0.6	TP24_0.0-0.1	TP25_0.0-0.1	TP25_0.9-1.0	TP26_0.5-0.6	TP26_1.5-1.6	TP27_0.0-0.1	TP27_0.5-0.6	TP28_0.0-0.1	TP29_0.3-0.4	TP30_0.0-0.1	BH2-1.0	BH3-1.0	BH4-1.0	BH5-1.0					
Sample Depth:					0.5-0.6	0.0-0.1	0.0-0.1	0.9-1.0	0.5-0.6	1.5-1.6	0.0-0.1	0.5-0.6	0.0-0.1	0.3-0.4	0.0-0.1	1	1	1	1					
Sample Matrix:					Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand	Fill/Sand					
Sample Date:					26/06/2013	26/06/2013	26/06/2013	26/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	25/06/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013					
Sample Type:					PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS					
Analyte	Units	LOR	Site EIL - Urban Residential (Coarse/Sand)	Site EIL - Commercial / Industrial (Coarse/Sand)																				
Total Metals																								
Arsenic	mg/kg	5	100	160	166	16	10	209	9	22	<5	35	26	13	201	<5	<5	<5	11					
Cadmium	mg/kg	1			4	4	3	4	<1	2	<1	8	2	13	10	<1	<1	<1	<1					
Chromium	mg/kg	2	420	680	19	13	9	11	22	17	6	12	9	5	13	30	26	31	26					
Copper	mg/kg	5	205	265	1330	1480	791	1060	132	923	262	479	2240	333	2820	68	102	79	83					
Lead	mg/kg	5	1100	1800	489	191	243	253	66	156	38	155	397	44	657	7	9	14	44					
Manganese	mg/kg	5			164	475	360	154	121	334	231	89	442	20	296	21	16	75	103					
Mercury	mg/kg	0.1			0.8	0.5	0.2	0.4	0.1	0.1	<0.1	0.2	0.4	0.1	1.2	<0.1	<0.1	<0.1	<0.1					
Nickel	mg/kg	2	175	295	7	9	12	6	5	22	8	13	12	7	11	15	3	9	7					
Selenium	mg/kg	5			<5	5	<5	<5	<5	<5	<5	<5	<5	<5	7	<5	<5	<5	<5					
Zinc	mg/kg	5	310	455	237	286	514	200	154	179	132	404	176	154	415	38	54	76	31					
Naphthalene	mg/kg	1	170	370	<1	<1	<1	-	-	<1	-	<1	<1	<1	<1	<1	<1	<1	<1					

Legend:
LOR - Limit of reporting
Lead, arsenic and naphthalene values were obtained from Table 1B (4) and Table 1B (5).
All the other parameters were calculated as EILs (ABC + ACL)

Natural / Clay material

					Location:		TP28	TP29	TP30	BH1		BH2	BH3	BH4	BH5	BH6	
					Sample ID :		TP28_0.9-1.0	TP29_0.9-1.0	TP30_0.5-0.6	BH1-0.5	BH1-1.0	BH2-0.1	BH3-0.1	BH4-0.4	BH5-0.1	BH6-0.3	BH6-1.0
					Sample Depth:		0.9-1.0	0.9-1.0	0.5-0.6	0.5	1	0.1	0.1	0.4	0.1	0.3	1
					Sample Matrix:		Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay	Natural/Clay
					Sample Date:		25/06/2013	25/06/2013	25/06/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013	09/10/2013
					Sample Type:		PS	PS	PS	PS	PS	PS	PS	PS	PS	PS	PS
			Site EIL - Urban Residential (Fine/Clay)	Site EIL - Commercial / Industrial (Fine/Clay)													
Analyte	Units	LOR															
Total Metals																	
Arsenic	mg/kg	5	100	160	<5	6	<5	<5	<5	6	37	73	5	<5	<5		
Cadmium	mg/kg	1			<1	<1	1	<1	<1	<1	3	5	1	<1	<1		
Chromium	mg/kg	2	420	680	14	17	21	32	11	9	20	26	6	32	25		
Copper	mg/kg	5	355	355	72	99	249	74	49	82	436	717	574	130	137		
Lead	mg/kg	5	1100	1800	22	14	67	8	7	219	350	404	92	10	8		
Manganese	mg/kg	5			142	35	32	19	<5	92	147	248	161	550	87		
Mercury	mg/kg	0.1			<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	<0.1	0.1	<0.1	<0.1		
Nickel	mg/kg	2	275	465	6	6	4	6	<2	4	8	24	3	30	15		
Selenium	mg/kg	5			<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Zinc	mg/kg	5	435	655	107	54	157	28	17	1150	257	798	190	111	90		
Naphthalene	mg/kg	1	170	370	-	-	-	-	<1	<1	<1	<1	<1	-	-		

Legend:
LOR - Limit of reporting
Lead, arsenic and naphthalene values were obtained from Table 1B (4) and Table 1B (5).
All the other parameters were calculated as EILs (ABC + ACL)

Table 10 - Groundwater Gauging Results
DSI_PKC Primary School
Golder Project No. 137623028

Well_ID	Location	X (m MGA)	Y (m MGA)	RL_TOC (mAHD)	RL_Ground (mAHD)	TOS (mBGS)	BOS (mBGS)	Date Guaged	DTW (mBTOC)	SWL (mAHD)	Comments
DEEP WELLS											
D1	School,Bakery	307904.9	6182141.6	33.47	33.5	1.9	8	17/07/2013	1.700	31.77	
D4	School,Bakery	307761.7	6182225.3	31.41	31.48	5	8	17/07/2013	0.450	30.96	

Legend:

MGA= the Map Grid of Australia

* - the coordinates are ISG system

RL_TOC= Relative Level Top of the Casing

mAHD= Meters Australian Height Datum

TOS= Top of the screen

BOS= Bottom of the screen

mBGS = Meters below ground surface

mBTOC = Meters below top of the casing

DTW= Depth to Water

"-" - No data

Table 11 - Groundwater Field Parameters
DSI_PKC Primary School
Golder Project No. 137623028

Monitoring Well ID	Date	Volume removed (L)	DO (mg/L)	EC (us/cm)	TDS (calc)	pH	ORP (mV)	Eh (mV)	Temp (°C)	Comments
D1	17-Jul-13	1	0.33	981	589	6.16	336.5	535.5	19.2	Clear, no odour.
		2	0.30	969	581	5.82	349.3	548.3	18.9	
		3	0.28	958	575	5.66	356.4	555.4	19.0	
		4	0.26	943	566	5.58	371.2	570.2	19.1	
D4	17-Jul-13	1	5.58	2743	1646	5.43	372.2	571.2	21.0	Clear, no odour.
		2	5.53	2757	1654	5.21	388.9	587.9	21.0	
		3	5.56	2758	1655	5.18	393.1	592.1	21.1	
		4	5.81	2760	1656	5.15	397.2	596.2	21.0	

Legend:

ORP - oxidation reduction potential as measured with a platinum electrode and silver-chloride reference electrode.

Eh - redox potential relative to the standard hydrogen electrode (calculated as Eh = ORP + 199 mV)

TDS - total dissolved solids (calculated as TDS = EC x 0.6).

DO - Dissolved Oxygen

EC - Electrical Conductivity

Table 12 Groundwater Analytical Results
DSI_PKC Primary School
Golder Project No. 137623028

						Sample ID : Sample Date: Depth of the water Sample Type	D1 17/07/2013 1.7m PS	D4 17/07/2013 0.45m PS
Analysis	LOR	Unit	10 x NHMRC 2011 Drinking Water	ANZECC 2000 Freshwater 95%	ANZECC 2000 Marine 95%			
Total Petroleum Hydrocarbons								
C6 - C9 Fraction	20	µg/L					<20	<20
C10 - C14 Fraction	50	µg/L					<50	<50
C15 - C28 Fraction	100	µg/L					<100	<100
C29 - C36 Fraction	50	µg/L					<50	<50
C10 - C36 Fraction (sum)	50	µg/L					<50	<50
Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	20	µg/L					<20	<20
C6 - C10 Fraction minus BTEX (F1)	20	µg/L					<20	<20
>C10 - C16 Fraction	100	µg/L					<100	<100
>C16 - C34 Fraction	100	µg/L					<100	<100
>C34 - C40 Fraction	100	µg/L					<100	<100
>C10 - C40 Fraction (sum)	100	µg/L					<100	<100
BTEXN								
Benzene	1	µg/L	10	950	700		<1	<1
Toluene	2	µg/L	8000				<2	<2
Ethylbenzene	2	µg/L	3000				<2	<2
meta- & para-Xylene	2	µg/L					<2	<2
ortho-Xylene	2	µg/L					<2	<2
Total Xylenes	2	µg/L	6000				<2	<2
Sum of BTEX	1	µg/L					<1	<1
Naphthalene	5	µg/L		16	70		<5	<5
Total Metals								
Arsenic	0.001	mg/L	0.1	0.013			0.004	0.005
Cadmium	0.0001	mg/L	0.02	0.0002	0.0055		0.0011	<0.0001
Chromium	0.001	mg/L	0.5	0.001	0.0044		0.003	0.003
Copper	0.001	mg/L	20	0.0014	0.0013		0.163	0.062
Lead	0.001	mg/L	0.1	0.0034	0.0044		0.004	0.003
Manganese	0.001	mg/L	1				0.042	0.15
Nickel	0.001	mg/L	0.2	0.011	0.07		0.008	0.015
Selenium	0.01	mg/L	0.1				<0.01	<0.01
Zinc	0.005	mg/L		0.008	0.015		0.105	0.055
Mercury	0.0001	mg/L	0.01	0.0006	0.0004		<0.0001	<0.0001
Phenolic Compounds								
Phenol	1	µg/L		320	400		<1.0	<1.0
2-Chlorophenol	1	µg/L	3000				<1.0	<1.0
2-Methylphenol	1	µg/L					<1.0	<1.0
3- & 4-Methylphenol	2	µg/L					<2.0	<2.0
2-Nitrophenol	1	µg/L					<1.0	<1.0
2,4-Dimethylphenol	1	µg/L					<1.0	<1.0
2,4-Dichlorophenol	1	µg/L	2000				<1.0	<1.0
2,6-Dichlorophenol	1	µg/L					<1.0	<1.0
4-Chloro-3-Methylphenol	1	µg/L					<1.0	<1.0
2,4,6-Trichlorophenol	1	µg/L	200				<1.0	<1.0
2,4,5-Trichlorophenol	1	µg/L					<1.0	<1.0
Pentachlorophenol	2	µg/L	100	10	22		<2.0	<2.0
Polynuclear Aromatic Hydrocarbons								
Naphthalene	1	µg/L		16	70		<1.0	<1.0
Acenaphthylene	1	µg/L					<1.0	<1.0
Acenaphthene	1	µg/L					<1.0	<1.0
Fluorene	1	µg/L					<1.0	<1.0
Phenanthrene	1	µg/L					<1.0	<1.0
Anthracene	1	µg/L					<1.0	<1.0
Fluoranthene	1	µg/L					<1.0	<1.0
Pyrene	1	µg/L					<1.0	<1.0
Benz(a)anthracene	1	µg/L					<1.0	<1.0
Chrysene	1	µg/L					<1.0	<1.0
Benzo(b)fluoranthene	1	µg/L					<1.0	<1.0
Benzo(k)fluoranthene	1	µg/L					<1.0	<1.0
Benzo(a)pyrene	0.5	µg/L	0.01				<0.5	<0.5
Indeno(1,2,3-cd)pyrene	1	µg/L					<1.0	<1.0
Dibenz(a,h)anthracene	1	µg/L					<1.0	<1.0
Benzo(g,h,i)perylene	1	µg/L					<1.0	<1.0
Sum of polycyclic aromatic hydrocarbons	0.5	µg/L					<0.5	<0.5
Benzo(a)pyrene TEQ (WHO)	0.5	µg/L					<0.5	<0.5

Table 12 Groundwater Analytical Results
DSI_PKC Primary School
Golder Project No. 137623028

						Sample ID : Sample Date: Depth of the water Sample Type	D1 17/07/2013 1.7m PS	D4 17/07/2013 0.45m PS
Analysis	LOR	Unit	10 x NHMRC 2011 Drinking Water	ANZECC 2000 Freshwater 95%	ANZECC 2000 Marine 95%			
Nutrients								
Ammonia as N	0.01	mg/L					0.08	<0.01
Nitrite as N	0.01	mg/L	30				<0.01	<0.01
Nitrate as N	0.01	mg/L	500				0.02	120
Nitrite + Nitrate as N	0.01	mg/L					0.02	120
Total Kjeldahl Nitrogen as N	0.1	mg/L					0.8	29.8
Total Nitrogen as N	0.1	mg/L					0.8	150
Total Phosphorus as P	0.01	mg/L					0.47	0.62
Organochlorine Pesticides (OC)								
alpha-BHC	0.5	µg/L					<0.5	<0.5
Hexachlorobenzene (HCB)	0.5	µg/L					<0.5	<0.5
beta-BHC	0.5	µg/L					<0.5	<0.5
gamma-BHC	0.5	µg/L					<0.5	<0.5
delta-BHC	0.5	µg/L					<0.5	<0.5
Heptachlor	0.5	µg/L	3				<0.5	<0.5
Aldrin	0.5	µg/L					<0.5	<0.5
Heptachlor epoxide	0.5	µg/L					<0.5	<0.5
trans-Chlordane	0.5	µg/L					<0.5	<0.5
alpha-Endosulfan	0.5	µg/L					<0.5	<0.5
cis-Chlordane	0.5	µg/L					<0.5	<0.5
Dieldrin	0.5	µg/L					<0.5	<0.5
4,4'-DDE	0.5	µg/L					<0.5	<0.5
Endrin	0.5	µg/L		0.02	0.008		<0.5	<0.5
beta-Endosulfan	0.5	µg/L					<0.5	<0.5
4,4'-DDD	0.5	µg/L					<0.5	<0.5
Endrin aldehyde	0.5	µg/L					<0.5	<0.5
Endosulfan sulfate	0.5	µg/L	300	0.2	0.01		<0.5	<0.5
4,4'-DDT	2	µg/L	200				<2.0	<2.0
Endrin ketone	0.5	µg/L					<0.5	<0.5
Methoxychlor	2	µg/L	3000				<2.0	<2.0
Total Chlordane (sum)	0.5	µg/L					<0.5	<0.5
Sum of DDD + DDE + DDT	0.5	µg/L					<0.5	<0.5
Sum of Aldrin + Dieldrin	0.5	µg/L	3				<0.5	<0.5
Organophosphorus Pesticides (OP)								
Dichlorvos	0.5	µg/L					<0.5	<0.5
Demeton-S-methyl	0.5	µg/L					<0.5	<0.5
Monocrotophos	2	µg/L					<2.0	<2.0
Dimethoate	0.5	µg/L					<0.5	<0.5
Diazinon	0.5	µg/L	30				<0.5	<0.5
Chlorpyrifos-methyl	0.5	µg/L					<0.5	<0.5
Parathion-methyl	2	µg/L					<2.0	<2.0
Malathion	0.5	µg/L					<0.5	<0.5
Fenthion	0.5	µg/L					<0.5	<0.5
Chlorpyrifos	0.5	µg/L	100	0.01	0.009		<0.5	<0.5
Parathion	2	µg/L	100				<2.0	<2.0
Pirimphos-ethyl	0.5	µg/L					<0.5	<0.5
Chlorfenvinphos	0.5	µg/L					<0.5	<0.5
Bromophos-ethyl	0.5	µg/L					<0.5	<0.5
Fenamiphos	0.5	µg/L					<0.5	<0.5
Prothiofos	0.5	µg/L					<0.5	<0.5
Ethion	0.5	µg/L	30				<0.5	<0.5
Carbophenothion	0.5	µg/L					<0.5	<0.5
Azinphos Methyl	0.5	µg/L	30				<0.5	<0.5

Legend:

LOR - Limit of Reporting

PS - Primary Sample

- Not Analysed

FD - Field Duplicate

FT - Field Triplicate

ND - Not Detected

Values that exceed the investigations level are highlighted as:

10 x NHMRC 2011 Drinking Water (as per Section 2.8 NEPM - Risk in Recreational Water 2008 GMRRW)

ANZECC/ARMCANZ 2000 Freshwater 95% Guideline

ANZECC/ARMCANZ 2000 Marine 95% Guideline

Table 13 - Groundwater QAQC Analytical Results
DSI_PKC Primary School
Golder Project No. 137623028

		Sample ID :	QC300_17/07/13/
		Sample Date:	17/07/2013
		Sample Type	Rinsate Blank
Analysis	LOR	Unit	
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
Total Recoverable Hydrocarbons - NEPM 2010 Draft			
C6 - C10 Fraction	20	µg/L	<20
C6 - C10 Fraction minus BTEX (F1)	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
BTEXN			
Benzene	1	µg/L	<1
Toluene	2	µg/L	<2
Ethylbenzene	2	µg/L	<2
meta- & para-Xylene	2	µg/L	<2
ortho-Xylene	2	µg/L	<2
Total Xylenes	2	µg/L	<2
Sum of BTEX	1	µg/L	<1
Naphthalene	5	µg/L	<5
Total Metals			
Arsenic	0.001	mg/L	<0.001
Cadmium	0.0001	mg/L	<0.0001
Chromium	0.001	mg/L	<0.001
Copper	0.001	mg/L	<0.001
Nickel	0.001	mg/L	<0.001
Lead	0.001	mg/L	<0.001
Zinc	0.005	mg/L	<0.005
Manganese	0.001	mg/L	<0.001
Selenium	0.01	mg/L	<0.01
Mercury	0.0001	mg/L	<0.0001
Phenolic Compounds			
Phenol	1	µg/L	<1.0
2-Chlorophenol	1	µg/L	<1.0
2-Methylphenol	1	µg/L	<1.0
3- & 4-Methylphenol	2	µg/L	<2.0
2-Nitrophenol	1	µg/L	<1.0
2,4-Dimethylphenol	1	µg/L	<1.0
2,4-Dichlorophenol	1	µg/L	<1.0
2,6-Dichlorophenol	1	µg/L	<1.0
4-Chloro-3-Methylphenol	1	µg/L	<1.0
2,4,6-Trichlorophenol	1	µg/L	<1.0
2,4,5-Trichlorophenol	1	µg/L	<1.0
Pentachlorophenol	2	µg/L	<2.0
Polynuclear Aromatic Hydrocarbons			
Naphthalene	1	µg/L	<1.0
Acenaphthylene	1	µg/L	<1.0
Acenaphthene	1	µg/L	<1.0
Fluorene	1	µg/L	<1.0
Phenanthrene	1	µg/L	<1.0
Anthracene	1	µg/L	<1.0
Fluoranthene	1	µg/L	<1.0
Pyrene	1	µg/L	<1.0
Benz(a)anthracene	1	µg/L	<1.0
Chrysene	1	µg/L	<1.0
Benzo(b)fluoranthene	1	µg/L	<1.0
Benzo(k)fluoranthene	1	µg/L	<1.0
Benzo(a)pyrene	0.5	µg/L	<0.5
Indeno(1.2.3.cd)pyrene	1	µg/L	<1.0
Dibenz(a,h)anthracene	1	µg/L	<1.0
Benzo(g,h,i)perylene	1	µg/L	<1.0
Sum of polycyclic aromatic hydrocarbons	0.5	µg/L	<0.5
Benzo(a)pyrene TEQ (WHO)	0.5	µg/L	<0.5

Legend:

LOR - Limit of reporting



APPENDIX E

Laboratory Certificates of Analysis and Data Validation

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EW1301886	Page	: 1 of 70
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division NSW South Coast
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 99 Kenny Street, Wollongong 2500 Unit 4 / 13 Geary Place, PO Box 3105, North Nowra 2541 AUSTRALIA
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 27-JUN-2013
C-O-C number	: ----	Issue Date	: 10-JUL-2013
Sampler	: KE YE	No. of samples received	: 103
Site	: PKC-PRIMARY SCHOOL	No. of samples analysed	: 64
Quote number	: ----		

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

This Certificate of Analysis contains the following information:

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



General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

LOR = Limit of reporting

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

- **EA200 Legend**
- **EA200 'Am'** Amosite (brown asbestos)
- **EA200 'Ch'** Chrysotile (white asbestos)
- **EA200 'Cr'** Crocidolite (blue asbestos)
- **EA200 'Trace'** - Asbestos fibres detected at levels below 0.1g/kg. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- **EA200: 'UMF'** Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- **EA200:** Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- **EA200:** Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- **EA200Q:** ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2011 NEPM for Assessment of Site Contamination
- **EA200Q:** Estimations of Asbestos weight and percentages are not covered under the Scope of NATA Accreditation.
Weights and percentages of Asbestos are approximate estimates only. Weights are based on extracted fibre bundles and ACM, and percentages are estimated based on the NEPM default Asbestos content in ACM. All numerical results under this method are approximate and should be used as a guide only.
- **EG005T:** Poor precision and poor spike recovery was obtained for some elements on sample EW1301886 - 1. Results have been confirmed by re-extraction and reanalysis.
- **EG005T:** Poor precision was obtained for Lead on sample EW1301886 - 1. Results have been confirmed by re-extraction and reanalysis.
- **EK057G/EK059G:** LOR raised for Nitrite/NOx analysis on various samples due to sample matrix.
- **EK067G:** Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories		
This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.		
Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
		Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
		Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
		Sydney Organics



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP30_0.0-0.1_25/06/13	TP30_0.5-0.6_25/06/13	TP29_0.3-0.4_25/06/13	TP29_0.9-1.0_25/06/13	TP27_0.0-0.1_25/06/13
Client sampling date / time				25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-001	EW1301886-002	EW1301886-005	EW1301886-007	EW1301886-008
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	6.3	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	33.4	35.9	21.3	25.1	30.5
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	11	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	1.2	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	1.1	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	<0.1	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	0.2	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	2.5	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	201	<5	13	6	<5
Cadmium	7440-43-9	1	mg/kg	10	1	13	<1	<1
Chromium	7440-47-3	2	mg/kg	13	21	5	17	6
Copper	7440-50-8	5	mg/kg	2820	249	333	99	262
Iron	7439-89-6	50	mg/kg	----	----	15500	----	----
Lead	7439-92-1	5	mg/kg	657	67	44	14	38
Manganese	7439-96-5	5	mg/kg	296	32	20	35	231
Nickel	7440-02-0	2	mg/kg	11	4	7	6	8
Selenium	7782-49-2	5	mg/kg	7	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	415	157	154	54	132
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	1.2	<0.1	0.1	<0.1	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	----	<20	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	2.5	----	----
Total Organic Carbon	----	0.5	%	----	----	1.4	----	----
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	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP30_0.0-0.1_25/06/13	TP30_0.5-0.6_25/06/13	TP29_0.3-0.4_25/06/13	TP29_0.9-1.0_25/06/13	TP27_0.0-0.1_25/06/13
Client sampling date / time				25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-001	EW1301886-002	EW1301886-005	EW1301886-007	EW1301886-008
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	----
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	----	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	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP30_0.0-0.1_25/06/13	TP30_0.5-0.6_25/06/13	TP29_0.3-0.4_25/06/13	TP29_0.9-1.0_25/06/13	TP27_0.0-0.1_25/06/13
Client sampling date / time				25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-001	EW1301886-002	EW1301886-005	EW1301886-007	EW1301886-008
EP068B: Organophosphorus Pesticides (OP) - Continued								
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	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	----	----
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	0.9	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	0.9	----	<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	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP30_0.0-0.1_25/06/13	TP30_0.5-0.6_25/06/13	TP29_0.3-0.4_25/06/13	TP29_0.9-1.0_25/06/13	TP27_0.0-0.1_25/06/13
Client sampling date / time				25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-001	EW1301886-002	EW1301886-005	EW1301886-007	EW1301886-008
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	<0.5	----	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.8	----	<0.5	----	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	----	<0.5	----	----
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	----	<10	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	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	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	----	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	81.7	----	74.0	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TP30_0.0-0.1_25/06/13	TP30_0.5-0.6_25/06/13	TP29_0.3-0.4_25/06/13	TP29_0.9-1.0_25/06/13	TP27_0.0-0.1_25/06/13
Client sampling date / time					25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 10:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-001	EW1301886-002	EW1301886-005	EW1301886-007	EW1301886-008	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%	93.0	----	87.8	----	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	82.0	----	83.6	----	----	
2-Chlorophenol-D4	93951-73-6	0.1	%	90.0	----	88.4	----	----	
2,4,6-Tribromophenol	118-79-6	0.1	%	92.2	----	90.4	----	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	98.8	----	95.9	----	----	
Anthracene-d10	1719-06-8	0.1	%	95.4	----	96.8	----	----	
4-Terphenyl-d14	1718-51-0	0.1	%	82.3	----	94.0	----	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%	95.9	----	93.6	----	----	
Toluene-D8	2037-26-5	0.1	%	99.4	----	99.0	----	----	
4-Bromofluorobenzene	460-00-4	0.1	%	92.6	----	97.2	----	----	

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TP27_0.5-0.6_25/06/13	TP28_0.0-0.1_25/06/13	TP28_0.9-1.0_25/06/13	TP26_0.5-0.6_25/06/13	TP26_1.5-1.6_25/06/13
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-009	EW1301886-012	EW1301886-014	EW1301886-017	EW1301886-019	
EA002 : pH (Soils)									
pH Value	----	0.1	pH Unit	----	----	7.0	----	----	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%	29.2	41.3	30.2	25.9	22.3	
EA150: Soil Classification based on Particle Size									
Clay (<2 µm)	----	1	%	----	----	48	----	----	
ED008: Exchangeable Cations									
Exchangeable Calcium	----	0.1	meq/100g	----	----	15.1	----	----	
Exchangeable Magnesium	----	0.1	meq/100g	----	----	9.7	----	----	
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.2	----	----	
Exchangeable Sodium	----	0.1	meq/100g	----	----	0.8	----	----	
Cation Exchange Capacity	----	0.1	meq/100g	----	----	25.9	----	----	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	35	26	<5	9	22	
Cadmium	7440-43-9	1	mg/kg	8	2	<1	<1	2	
Chromium	7440-47-3	2	mg/kg	12	9	14	22	17	
Copper	7440-50-8	5	mg/kg	479	2240	72	132	923	
Iron	7439-89-6	50	mg/kg	----	----	42200	----	----	
Lead	7439-92-1	5	mg/kg	155	397	22	66	156	
Manganese	7439-96-5	5	mg/kg	89	442	142	121	334	
Nickel	7440-02-0	2	mg/kg	13	12	6	5	22	
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5	
Zinc	7440-66-6	5	mg/kg	404	176	107	154	179	
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.2	0.4	<0.1	0.1	0.1	
EK055: Ammonia as N									
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	----	<20	<20	
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N (Sol.)	----	0.1	mg/kg	----	----	----	<1.0	<0.1	
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	<1.0	<0.1	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	----	----	<1.0	<0.1	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP27_0.5-0.6_25/06/13	TP28_0.0-0.1_25/06/13	TP28_0.9-1.0_25/06/13	TP26_0.5-0.6_25/06/13	TP26_1.5-1.6_25/06/13
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-009	EW1301886-012	EW1301886-014	EW1301886-017	EW1301886-019
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser - Continued								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	----	----	1040	470
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	----	----	1040	470
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	----	----	261	888
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	1.0	----	----
Total Organic Carbon	----	0.5	%	----	----	0.6	----	----
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP27_0.5-0.6_25/06/13	TP28_0.0-0.1_25/06/13	TP28_0.9-1.0_25/06/13	TP26_0.5-0.6_25/06/13	TP26_1.5-1.6_25/06/13
				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-009	EW1301886-012	EW1301886-014	EW1301886-017	EW1301886-019
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Sum of DDD + DDE + DDT	----	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
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Compound	CAS Number	LOR	Unit	TP27_0.5-0.6_25/06/13	TP28_0.0-0.1_25/06/13	TP28_0.9-1.0_25/06/13	TP26_0.5-0.6_25/06/13	TP26_1.5-1.6_25/06/13
				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
				EW1301886-009	EW1301886-012	EW1301886-014	EW1301886-017	EW1301886-019
EP075(SIM)A: Phenolic Compounds - Continued								
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	----	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	0.8	----	----	<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	5.6	----	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	0.6	----	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	1.6	----	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	2.7	----	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.7	----	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	4.3	----	----	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	1.1	----	----	<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	0.7	----	----	<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	0.6	----	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	19.7	----	----	<0.5
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	1.0	----	----	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	<50
C15 - C28 Fraction	----	100	mg/kg	<100	1000	----	----	<100
C29 - C36 Fraction	----	100	mg/kg	<100	490	----	----	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	1490	----	----	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	----	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	----	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	70	----	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	1330	----	----	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	220	----	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	1620	----	----	<50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP27_0.5-0.6_25/06/13	TP28_0.0-0.1_25/06/13	TP28_0.9-1.0_25/06/13	TP26_0.5-0.6_25/06/13	TP26_1.5-1.6_25/06/13
Client sampling date / time				25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00	25-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-009	EW1301886-012	EW1301886-014	EW1301886-017	EW1301886-019
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	----	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	0.6	----	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	0.5	----	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	0.5	----	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	1.1	----	----	<0.2
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	----	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	80.7	110	----	----	89.9
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	91.5	95.2	----	----	88.6
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	76.0	82.9	----	----	83.4
2-Chlorophenol-D4	93951-73-6	0.1	%	69.5	90.2	----	----	88.9
2,4,6-Tribromophenol	118-79-6	0.1	%	43.4	86.4	----	----	92.5
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	98.4	103	----	----	99.4
Anthracene-d10	1719-06-8	0.1	%	87.0	92.3	----	----	98.4
4-Terphenyl-d14	1718-51-0	0.1	%	91.4	85.9	----	----	88.7
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	97.7	85.2	----	----	102
Toluene-D8	2037-26-5	0.1	%	98.3	91.0	----	----	116
4-Bromofluorobenzene	460-00-4	0.1	%	80.5	76.8	----	----	106



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				QC400_25/06/13	TP25_0.0-0.1_26/06/13	TP25_0.9-1.0_26/06/13	QC100_26/06/13	TP24_0.0-0.1_26/06/13
				25-JUN-2013 15:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Client sampling date / time				EW1301886-023	EW1301886-024	EW1301886-026	EW1301886-029	EW1301886-030
Compound	CAS Number	LOR	Unit					
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	5.6	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	21.5	34.8	23.0	33.0	31.3
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	12	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	2.6	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	0.8	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	0.1	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	0.1	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	3.6	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	10	209	7	16
Cadmium	7440-43-9	1	mg/kg	<1	3	4	2	4
Chromium	7440-47-3	2	mg/kg	<2	9	11	6	13
Copper	7440-50-8	5	mg/kg	<5	791	1060	521	1480
Iron	7439-89-6	50	mg/kg	----	12000	----	----	----
Lead	7439-92-1	5	mg/kg	<5	243	253	124	191
Manganese	7439-96-5	5	mg/kg	10	296	154	319	475
Nickel	7440-02-0	2	mg/kg	<2	12	6	10	9
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	5
Zinc	7440-66-6	5	mg/kg	<5	514	200	190	286
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.2	0.4	0.1	0.5
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	----	<20	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	5.8	----	----	----
Total Organic Carbon	----	0.5	%	----	3.4	----	----	----
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

Client sampling date / time

				QC400_25/06/13	TP25_0.0-0.1_26/06/13	TP25_0.9-1.0_26/06/13	QC100_26/06/13	TP24_0.0-0.1_26/06/13
				25-JUN-2013 15:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-023	EW1301886-024	EW1301886-026	EW1301886-029	EW1301886-030
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	----	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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				QC400_25/06/13	TP25_0.0-0.1_26/06/13	TP25_0.9-1.0_26/06/13	QC100_26/06/13	TP24_0.0-0.1_26/06/13
				25-JUN-2013 15:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Client sampling date / time				EW1301886-023	EW1301886-024	EW1301886-026	EW1301886-029	EW1301886-030
Compound	CAS Number	LOR	Unit					
EP068B: Organophosphorus Pesticides (OP) - Continued								
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	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	----
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	1.8	----	3.2	----
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	----	0.9	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	0.8	----	1.4	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	0.7	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.2	----	2.0	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				QC400_25/06/13	TP25_0.0-0.1_26/06/13	TP25_0.9-1.0_26/06/13	QC100_26/06/13	TP24_0.0-0.1_26/06/13
				25-JUN-2013 15:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
				EW1301886-023	EW1301886-024	EW1301886-026	EW1301886-029	EW1301886-030
Compound	CAS Number	LOR	Unit					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b)fluoranthene	205-99-2	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	4.3	----	8.7	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction	----	100	mg/kg	<100	360	----	550	----
C29 - C36 Fraction	----	100	mg/kg	<100	180	----	240	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	540	----	790	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	480	----	700	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	110	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	480	----	810	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	78.8	90.8	----	99.7	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC400_25/06/13	TP25_0.0-0.1_26/06/13	TP25_0.9-1.0_26/06/13	QC100_26/06/13	TP24_0.0-0.1_26/06/13
Client sampling date / time					25-JUN-2013 15:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-023	EW1301886-024	EW1301886-026	EW1301886-029	EW1301886-030	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%	82.7	80.9	----	80.1	----	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	86.4	92.4	----	78.4	----	
2-Chlorophenol-D4	93951-73-6	0.1	%	91.4	90.4	----	85.9	----	
2,4,6-Tribromophenol	118-79-6	0.1	%	86.5	85.8	----	85.5	----	
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%	96.7	97.0	----	103	----	
Anthracene-d10	1719-06-8	0.1	%	89.6	90.0	----	92.8	----	
4-Terphenyl-d14	1718-51-0	0.1	%	88.6	87.5	----	88.7	----	
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%	97.3	93.8	----	88.9	----	
Toluene-D8	2037-26-5	0.1	%	100	97.1	----	93.8	----	
4-Bromofluorobenzene	460-00-4	0.1	%	94.3	87.9	----	82.0	----	



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	5.0	4.8	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	27.1	29.8	32.8	44.0	35.3
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	47	29	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	----	Yes	----	----	----
Asbestos Type	1332-21-4	1	--	----	Ch	----	----	----
Sample weight (dry)	----	0.01	g	----	7840	----	----	----
APPROVED IDENTIFIER:	----	1	--	----	C.OWLER	----	----	----
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	----	7.84	----	----	----
Asbestos Containing Material	1332-21-4	0.1	g	----	<0.1	----	----	----
Fibrous Asbestos	----	0.002	g	----	0.023	----	----	----
Asbestos Fines	1332-21-4	-	-	----	Yes	----	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	----	<0.01	----	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	0.001	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	3.8	7.7	----	----	----
Exchangeable Magnesium	----	0.1	meq/100g	8.3	2.1	----	----	----
Exchangeable Potassium	----	0.1	meq/100g	0.1	0.3	----	----	----
Exchangeable Sodium	----	0.1	meq/100g	1.1	0.2	----	----	----
Cation Exchange Capacity	----	0.1	meq/100g	13.3	10.4	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	166	<5	11	33
Cadmium	7440-43-9	1	mg/kg	<1	4	<1	10	5
Chromium	7440-47-3	2	mg/kg	29	19	27	12	13
Copper	7440-50-8	5	mg/kg	123	1330	110	320	335
Iron	7439-89-6	50	mg/kg	56900	31700	----	----	----
Lead	7439-92-1	5	mg/kg	70	489	7	48	61
Manganese	7439-96-5	5	mg/kg	61	164	50	1580	122



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Compound	CAS Number	LOR	Unit	TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
				EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039
EG005T: Total Metals by ICP-AES - Continued								
Nickel	7440-02-0	2	mg/kg	7	7	10	24	6
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	258	237	76	369	145
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.8	<0.1	0.1	0.2
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	----	<20	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	----	0.1	mg/kg	----	<1.0	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	----	0.1	mg/kg	----	<1.0	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	----	<1.0	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	----	1590	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	----	1590	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	----	667	----	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	1.3	2.7	----	----	----
Total Organic Carbon	----	0.5	%	0.8	1.6	----	----	----
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
				EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039
EP068B: Organophosphorus Pesticides (OP) - Continued								
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
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	<2
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)fluoranthene	205-99-2	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

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039	
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	<10	
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 2010 Draft									
C6 - C10 Fraction	----	10	mg/kg	<10	<10	----	<10	<10	
C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	----	<10	<10	
>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	
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2	
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
EP080: BTEXN									
Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	<0.5	
Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2	
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	<1	
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.1	%	86.1	77.9	----	73.2	85.8	
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%	102	83.0	----	80.3	98.4	
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%	83.9	87.4	----	73.8	91.1	
2-Chlorophenol-D4	93951-73-6	0.1	%	87.9	91.1	----	76.9	87.8	
2,4,6-Tribromophenol	118-79-6	0.1	%	90.4	92.1	----	70.0	92.2	
EP075(SIM)T: PAH Surrogates									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP24_0.5-0.6_26/06/13	TP20_0.5-0.6_26/06/13	TP20_0.9-1.0_26/06/13	TP16A_0.2-0.3_26/06/13	TP16A_0.5-0.6_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-031	EW1301886-034	EW1301886-035	EW1301886-038	EW1301886-039
EP075(SIM)T: PAH Surrogates - Continued								
2-Fluorobiphenyl	321-60-8	0.1	%	97.0	99.8	----	96.7	97.4
Anthracene-d10	1719-06-8	0.1	%	96.6	94.3	----	90.3	97.4
4-Terphenyl-d14	1718-51-0	0.1	%	90.0	83.2	----	88.1	85.8
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	99.7	84.6	----	91.4	99.8
Toluene-D8	2037-26-5	0.1	%	106	87.2	----	90.6	104
4-Bromofluorobenzene	460-00-4	0.1	%	97.1	85.1	----	72.6	98.6



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP16A_0.9-1.0_26/06/13	TP16B_0.1-0.2_26/06/13	TP15_0.0-0.1_26/06/13	TP15_0.9-1.0_26/06/13	TP14_0.0-0.1_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-040	EW1301886-041	EW1301886-042	EW1301886-044	EW1301886-045
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	----	5.1	4.4
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	----	----	31.0	12.4	21.4
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	18	10
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	Yes	Yes	Yes	----	----
Asbestos Type	1332-21-4	0.1	--	Ch + Am	Ch + Am + Cr	----	----	----
Asbestos Type	1332-21-4	1	--	----	----	Ch + Am	----	----
Sample weight (dry)	----	0.01	g	86.3	28.5	6390	----	----
APPROVED IDENTIFIER:	----	1	--	----	----	C.OWLER	----	----
APPROVED IDENTIFIER:	----	-	--	C.OWLER	C.OWLER	----	----	----
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	----	----	6.39	----	----
Asbestos Containing Material	1332-21-4	0.1	g	----	----	<0.1	----	----
Fibrous Asbestos	----	0.002	g	----	----	0.004	----	----
Asbestos Fines	1332-21-4	-	-	----	----	Yes	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	----	----	<0.01	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	----	<0.001	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	1.2	0.8
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	11.7	0.2
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	0.2	<0.1
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	0.6	<0.1
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	13.7	1.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	8	<5	11
Cadmium	7440-43-9	1	mg/kg	----	----	4	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	8	20	8
Copper	7440-50-8	5	mg/kg	----	----	1620	139	660
Iron	7439-89-6	50	mg/kg	----	----	----	50100	12000



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP16A_0.9-1.0_26/06/ 13	TP16B_0.1-0.2_26/06/ 13	TP15_0.0-0.1_26/06/1 3	TP15_0.9-1.0_26/06/1 3	TP14_0.0-0.1_26/06/1 3
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-040	EW1301886-041	EW1301886-042	EW1301886-044	EW1301886-045
EG005T: Total Metals by ICP-AES - Continued								
Lead	7439-92-1	5	mg/kg	----	----	239	10	415
Manganese	7439-96-5	5	mg/kg	----	----	549	202	123
Nickel	7440-02-0	2	mg/kg	----	----	10	18	5
Selenium	7782-49-2	5	mg/kg	----	----	<5	<5	5
Zinc	7440-66-6	5	mg/kg	----	----	231	98	85
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	0.2	<0.1	0.3
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	----	<20	----	<20
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	----	<0.5	1.5
Total Organic Carbon	----	0.5	%	----	----	----	<0.5	0.9
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

				TP16A_0.9-1.0_26/06/ 13	TP16B_0.1-0.2_26/06/ 13	TP15_0.0-0.1_26/06/1 3	TP15_0.9-1.0_26/06/1 3	TP14_0.0-0.1_26/06/1 3
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-040	EW1301886-041	EW1301886-042	EW1301886-044	EW1301886-045
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	----	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
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	----	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP16A_0.9-1.0_26/06/ 13	TP16B_0.1-0.2_26/06/ 13	TP15_0.0-0.1_26/06/1 3	TP15_0.9-1.0_26/06/1 3	TP14_0.0-0.1_26/06/1 3
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-040	EW1301886-041	EW1301886-042	EW1301886-044	EW1301886-045
EP075(SIM)A: Phenolic Compounds - Continued								
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	----	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	----	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	----	<2	----	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	----	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	----	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	----	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<0.5	----	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	----	<0.5	----	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	----	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	----	<0.5	----	<0.5
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	----	----	<0.5	----	<0.5
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	----	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	----	----	<10	----	<10



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP16A_0.9-1.0_26/06/13	TP16B_0.1-0.2_26/06/13	TP15_0.0-0.1_26/06/13	TP15_0.9-1.0_26/06/13	TP14_0.0-0.1_26/06/13
Client sampling date / time				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-040	EW1301886-041	EW1301886-042	EW1301886-044	EW1301886-045
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C10 - C16 Fraction	----	50	mg/kg	----	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	----	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg	----	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	----	<50	----	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg	----	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	----	<0.5	----	<0.5
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	----	<0.2	----	<0.2
Naphthalene	91-20-3	1	mg/kg	----	----	<1	----	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	----	76.8	----	85.6
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	85.1	----	93.9
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	----	82.6	----	68.4
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	86.4	----	78.6
2,4,6-Tribromophenol	118-79-6	0.1	%	----	----	73.8	----	67.6
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	99.5	----	77.7
Anthracene-d10	1719-06-8	0.1	%	----	----	92.7	----	75.0
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	86.2	----	67.1
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	----	97.5	----	93.9
Toluene-D8	2037-26-5	0.1	%	----	----	108	----	91.8
4-Bromofluorobenzene	460-00-4	0.1	%	----	----	98.8	----	86.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP14_0.5-0.6_26/06/13	TP13_0.5-0.6_26/06/13	TP13_1.5-1.6_26/06/13	TP9_0.3-0.4_26/06/13	TP9_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-046	EW1301886-050	EW1301886-052	EW1301886-054	EW1301886-055
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	----	----	5.1
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	28.5	24.1	29.0	26.1	30.1
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	----	60
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	----	11.2
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	----	12.2
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	----	0.3
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	----	1.8
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	----	25.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	17	<5	36	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	11	<1
Chromium	7440-47-3	2	mg/kg	18	10	15	21	21
Copper	7440-50-8	5	mg/kg	60	171	63	1020	82
Iron	7439-89-6	50	mg/kg	----	----	----	----	42400
Lead	7439-92-1	5	mg/kg	6	38	6	192	10
Manganese	7439-96-5	5	mg/kg	6	72	35	111	9
Nickel	7440-02-0	2	mg/kg	2	4	2	9	2
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	13	35	21	443	17
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.3	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	----	<20	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	----	----	1.2
Total Organic Carbon	----	0.5	%	----	----	----	----	0.7
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP14_0.5-0.6_26/06/13	TP13_0.5-0.6_26/06/13	TP13_1.5-1.6_26/06/13	TP9_0.3-0.4_26/06/13	TP9_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-046	EW1301886-050	EW1301886-052	EW1301886-054	EW1301886-055
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----
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	----	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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP14_0.5-0.6_26/06/13	TP13_0.5-0.6_26/06/13	TP13_1.5-1.6_26/06/13	TP9_0.3-0.4_26/06/13	TP9_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-046	EW1301886-050	EW1301886-052	EW1301886-054	EW1301886-055
EP068B: Organophosphorus Pesticides (OP) - Continued								
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	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	----	<2	----
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP14_0.5-0.6_26/06/13	TP13_0.5-0.6_26/06/13	TP13_1.5-1.6_26/06/13	TP9_0.3-0.4_26/06/13	TP9_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-046	EW1301886-050	EW1301886-052	EW1301886-054	EW1301886-055
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	----	<0.5	----
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	----	<0.5	----	<0.5	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	----	<0.5	----	<0.5	----
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	----	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	----	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	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	<0.5	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	----	<0.2	----
Naphthalene	91-20-3	1	mg/kg	----	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	88.4	----	94.7	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP14_0.5-0.6_26/06/13	TP13_0.5-0.6_26/06/13	TP13_1.5-1.6_26/06/13	TP9_0.3-0.4_26/06/13	TP9_0.5-0.6_26/06/13
				26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 10:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-046	EW1301886-050	EW1301886-052	EW1301886-054	EW1301886-055
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	84.6	----	96.4	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	79.6	----	86.6	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	82.9	----	88.7	----
2,4,6-Tribromophenol	118-79-6	0.1	%	----	77.0	----	91.0	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	86.2	----	93.9	----
Anthracene-d10	1719-06-8	0.1	%	----	89.8	----	98.2	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	78.8	----	89.8	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	89.0	----	86.4	----
Toluene-D8	2037-26-5	0.1	%	----	85.5	----	87.2	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	83.9	----	83.0	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP10_0.0-0.1_26/06/13	TP10_0.5-0.6_26/06/13	TP11_0.1-0.2_26/06/13	TP11_0.9-1.0_26/06/13	TP12A_0.1-0.2_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-056	EW1301886-057	EW1301886-059	EW1301886-061	EW1301886-063
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	6.8	----	----	6.2	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	31.2	29.7	27.1	13.9	----
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	24	----	----	22	----
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Asbestos Detected	1332-21-4	0.1	g/kg	Yes	----	Yes	----	Yes
Asbestos Type	1332-21-4	0.1	--	----	----	----	----	Ch + Am
Asbestos Type	1332-21-4	1	--	Ch	----	Ch + Am	----	----
Sample weight (dry)	----	0.01	g	6290	----	9040	----	27.1
APPROVED IDENTIFIER:	----	1	--	C.OWLER	----	C.OWLER	----	----
APPROVED IDENTIFIER:	----	-	--	----	----	----	----	C.OWLER
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	6.29	----	9.04	----	----
Asbestos Containing Material	1332-21-4	0.1	g	64.6	----	<0.1	----	----
Fibrous Asbestos	----	0.002	g	0.008	----	0.007	----	----
Asbestos Fines	1332-21-4	-	-	Yes	----	Yes	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	----	----	<0.01	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	0.10	----	----	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	<0.001	----	<0.001	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	21.7	----	----	0.7	----
Exchangeable Magnesium	----	0.1	meq/100g	1.7	----	----	12.6	----
Exchangeable Potassium	----	0.1	meq/100g	0.7	----	----	<0.1	----
Exchangeable Sodium	----	0.1	meq/100g	0.2	----	----	6.3	----
Cation Exchange Capacity	----	0.1	meq/100g	24.3	----	----	19.7	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	31	<5	<5	<5	----
Cadmium	7440-43-9	1	mg/kg	3	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	16	24	19	14	----
Copper	7440-50-8	5	mg/kg	422	88	201	73	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP10_0.0-0.1_26/06/13	TP10_0.5-0.6_26/06/13	TP11_0.1-0.2_26/06/13	TP11_0.9-1.0_26/06/13	TP12A_0.1-0.2_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-056	EW1301886-057	EW1301886-059	EW1301886-061	EW1301886-063
EG005T: Total Metals by ICP-AES - Continued								
Iron	7439-89-6	50	mg/kg	34800	----	----	22800	----
Lead	7439-92-1	5	mg/kg	124	9	21	6	----
Manganese	7439-96-5	5	mg/kg	88	15	39	21	----
Nickel	7440-02-0	2	mg/kg	6	4	6	5	----
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	----
Zinc	7440-66-6	5	mg/kg	256	27	92	38	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	<0.1	<0.1	----
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	----	<20	----	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	5.5	----	----	0.6	----
Total Organic Carbon	----	0.5	%	3.2	----	----	<0.5	----
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	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Compound	CAS Number	LOR	Unit	TP10_0.0-0.1_26/06/13	TP10_0.5-0.6_26/06/13	TP11_0.1-0.2_26/06/13	TP11_0.9-1.0_26/06/13	TP12A_0.1-0.2_26/06/13
				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-056	EW1301886-057	EW1301886-059	EW1301886-061	EW1301886-063
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	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	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Compound	CAS Number	LOR	Unit	TP10_0.0-0.1_26/06/13	TP10_0.5-0.6_26/06/13	TP11_0.1-0.2_26/06/13	TP11_0.9-1.0_26/06/13	TP12A_0.1-0.2_26/06/13
				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
				EW1301886-056	EW1301886-057	EW1301886-059	EW1301886-061	EW1301886-063
EP075(SIM)A: Phenolic Compounds - Continued								
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	----	----
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	0.9	----	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	1.1	----	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	0.5	----	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.8	----	<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	0.6	----	<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	0.6	----	<0.5	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	4.5	----	<0.5	----	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	0.7	----	<0.5	----	----
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	----	<10	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP10_0.0-0.1_26/06/13	TP10_0.5-0.6_26/06/13	TP11_0.1-0.2_26/06/13	TP11_0.9-1.0_26/06/13	TP12A_0.1-0.2_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-056	EW1301886-057	EW1301886-059	EW1301886-061	EW1301886-063
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
^ C6 - C10 Fraction minus BTEX (F1)	----	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	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	----	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	94.5	----	72.5	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	91.8	----	76.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	85.4	----	78.7	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	92.3	----	91.9	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	97.5	----	92.4	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	99.0	----	98.4	----	----
Anthracene-d10	1719-06-8	0.1	%	102	----	97.4	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	94.2	----	89.7	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	96.1	----	89.4	----	----
Toluene-D8	2037-26-5	0.1	%	99.0	----	89.8	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	91.3	----	88.0	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP12_0.0. -0.1_26/06/13	TP12_0.9-1.0_26/06/13	TP8_0.0-0.1_26/06/13	TP8_0.9-1.0_26/06/13	QC101_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-064	EW1301886-066	EW1301886-067	EW1301886-069	EW1301886-070
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	5.7	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	39.0	19.2	26.6	21.6	32.8
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	18	----	----
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	1	--	-	----	----	----	----
Sample weight (dry)	----	0.01	g	7660	----	----	----	----
APPROVED IDENTIFIER:	----	1	--	C.OWLER	----	----	----	----
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	7.66	----	----	----	----
Asbestos Containing Material	1332-21-4	0.1	g	<0.1	----	----	----	----
Fibrous Asbestos	----	0.002	g	<0.002	----	----	----	----
Asbestos Fines	1332-21-4	-	-	No	----	----	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	<0.01	----	----	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	<0.001	----	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	7.2	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	2.0	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.4	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	0.3	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	10.0	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	<5	41	<5	44
Cadmium	7440-43-9	1	mg/kg	3	<1	10	<1	14
Chromium	7440-47-3	2	mg/kg	10	19	22	12	23
Copper	7440-50-8	5	mg/kg	961	116	2280	76	1760
Iron	7439-89-6	50	mg/kg	----	----	38500	----	----
Lead	7439-92-1	5	mg/kg	173	6	677	<5	628
Manganese	7439-96-5	5	mg/kg	456	64	609	28	492



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP12_0.0. -0.1_26/06/13	TP12_0.9-1.0_26/06/13	TP8_0.0-0.1_26/06/13	TP8_0.9-1.0_26/06/13	QC101_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-064	EW1301886-066	EW1301886-067	EW1301886-069	EW1301886-070
EG005T: Total Metals by ICP-AES - Continued								
Nickel	7440-02-0	2	mg/kg	8	14	12	5	12
Selenium	7782-49-2	5	mg/kg	6	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	187	88	397	31	529
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	<0.1	0.3	<0.1	0.4
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	----	<20	----	<20
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	5.1	----	----
Total Organic Carbon	----	0.5	%	----	----	3.0	----	----
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP12_0.0. -0.1_26/06/13	TP12_0.9-1.0_26/06/13	TP8_0.0-0.1_26/06/13	TP8_0.9-1.0_26/06/13	QC101_26/06/13
				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-064	EW1301886-066	EW1301886-067	EW1301886-069	EW1301886-070
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	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
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP12_0.0. -0.1_26/06/13	TP12_0.9-1.0_26/06/13	TP8_0.0-0.1_26/06/13	TP8_0.9-1.0_26/06/13	QC101_26/06/13
				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-064	EW1301886-066	EW1301886-067	EW1301886-069	EW1301886-070
EP075(SIM)A: Phenolic Compounds - Continued								
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	----	<2
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)fluoranthene	205-99-2	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 (WHO)	----	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	<50	----	<50	----	<50
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	----	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP12_0.0. -0.1_26/06/13	TP12_0.9-1.0_26/06/13	TP8_0.0-0.1_26/06/13	TP8_0.9-1.0_26/06/13	QC101_26/06/13
Client sampling date / time				26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00	26-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-064	EW1301886-066	EW1301886-067	EW1301886-069	EW1301886-070
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	<0.2	----	<0.2
Naphthalene	91-20-3	1	mg/kg	<1	----	<1	----	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	86.6	----	80.9	----	94.2
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	107	----	88.0	----	98.9
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	102	----	87.5	----	96.4
2-Chlorophenol-D4	93951-73-6	0.1	%	96.9	----	87.4	----	97.8
2,4,6-Tribromophenol	118-79-6	0.1	%	95.0	----	93.2	----	100
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	102	----	103	----	103
Anthracene-d10	1719-06-8	0.1	%	100	----	98.4	----	104
4-Terphenyl-d14	1718-51-0	0.1	%	92.5	----	88.0	----	94.6
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	92.1	----	89.0	----	96.7
Toluene-D8	2037-26-5	0.1	%	91.5	----	89.2	----	101
4-Bromofluorobenzene	460-00-4	0.1	%	85.4	----	85.5	----	100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				QC401_26/06/13	TP7_0.3-0.4_27/06/13	TP7_0.5-0.6_27/06/13	TP6_0.2-0.3_27/06/13	TP6_0.5-0.6_27/06/13
Client sampling date / time				26-JUN-2013 15:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-071	EW1301886-074	EW1301886-075	EW1301886-078	EW1301886-079
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	6.9	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	5.5	21.2	33.8	37.3	28.8
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	60	----	----
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	1	--	----	-	----	----	----
Sample weight (dry)	----	0.01	g	----	7320	----	----	----
APPROVED IDENTIFIER:	----	1	--	----	C.OWLER	----	----	----
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	----	7.32	----	----	----
Asbestos Containing Material	1332-21-4	0.1	g	----	<0.1	----	----	----
Fibrous Asbestos	----	0.002	g	----	<0.002	----	----	----
Asbestos Fines	1332-21-4	-	-	----	No	----	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	----	<0.01	----	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	<0.001	----	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	17.5	----	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	10.5	----	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.1	----	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	1.7	----	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	29.9	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	7	<5	37	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	27	<1
Chromium	7440-47-3	2	mg/kg	<2	20	24	5	22
Copper	7440-50-8	5	mg/kg	<5	66	77	2740	61
Iron	7439-89-6	50	mg/kg	----	----	59200	----	----
Lead	7439-92-1	5	mg/kg	<5	19	9	216	7
Manganese	7439-96-5	5	mg/kg	12	50	20	362	48
Nickel	7440-02-0	2	mg/kg	<2	3	4	14	4



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				QC401_26/06/13	TP7_0.3-0.4_27/06/13	TP7_0.5-0.6_27/06/13	TP6_0.2-0.3_27/06/13	TP6_0.5-0.6_27/06/13
Client sampling date / time				26-JUN-2013 15:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-071	EW1301886-074	EW1301886-075	EW1301886-078	EW1301886-079
EG005T: Total Metals by ICP-AES - Continued								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	<5	41	24	500	9
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	----	<20	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	1.8	----	----
Total Organic Carbon	----	0.5	%	----	----	1.1	----	----
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	----
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				QC401_26/06/13	TP7_0.3-0.4_27/06/13	TP7_0.5-0.6_27/06/13	TP6_0.2-0.3_27/06/13	TP6_0.5-0.6_27/06/13
Client sampling date / time				26-JUN-2013 15:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-071	EW1301886-074	EW1301886-075	EW1301886-078	EW1301886-079
EP068A: Organochlorine Pesticides (OC) - Continued								
^ 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	----	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	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				QC401_26/06/13	TP7_0.3-0.4_27/06/13	TP7_0.5-0.6_27/06/13	TP6_0.2-0.3_27/06/13	TP6_0.5-0.6_27/06/13
				26-JUN-2013 15:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-071	EW1301886-074	EW1301886-075	EW1301886-078	EW1301886-079
EP075(SIM)A: Phenolic Compounds - Continued								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	----
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)fluoranthene	205-99-2	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 (WHO)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	----	<10	----
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	<100	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				QC401_26/06/13	TP7_0.3-0.4_27/06/13	TP7_0.5-0.6_27/06/13	TP6_0.2-0.3_27/06/13	TP6_0.5-0.6_27/06/13
				26-JUN-2013 15:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-071	EW1301886-074	EW1301886-075	EW1301886-078	EW1301886-079
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	<50	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	100	95.4	----	105	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	108	106	----	108	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	86.2	90.0	----	69.2	----
2-Chlorophenol-D4	93951-73-6	0.1	%	93.8	94.1	----	81.9	----
2,4,6-Tribromophenol	118-79-6	0.1	%	93.2	93.4	----	77.2	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	100	98.6	----	99.0	----
Anthracene-d10	1719-06-8	0.1	%	99.1	101	----	96.2	----
4-Terphenyl-d14	1718-51-0	0.1	%	91.7	93.8	----	91.3	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	96.6	----	81.1	----
Toluene-D8	2037-26-5	0.1	%	87.7	87.3	----	89.6	----
4-Bromofluorobenzene	460-00-4	0.1	%	89.7	85.0	----	86.0	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

TP5_0.5-0.6_27/06/13	QC102_27/06/13	TP5_0.9-1.0_27/06/13	TP1_0.0-0.1_27/06/13	TP1_0.9-1.0_27/06/13
27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088

Client sampling date / time

Compound	CAS Number	LOR	Unit	EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	5.3	6.1	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	26.1	26.1	25.2	26.0	9.6
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	43	13	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	2.5	9.9	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	11.6	2.6	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	0.2	0.3	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	1.1	0.2	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	15.4	13.0	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	33	<5	<5	6	<5
Cadmium	7440-43-9	1	mg/kg	4	4	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	13	12	17	13	14
Copper	7440-50-8	5	mg/kg	467	59	69	140	87
Iron	7439-89-6	50	mg/kg	----	----	33500	20300	----
Lead	7439-92-1	5	mg/kg	71	9	<5	29	<5
Manganese	7439-96-5	5	mg/kg	94	37	<5	374	38
Nickel	7440-02-0	2	mg/kg	6	5	<2	11	9
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	112	104	15	68	33
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	<20	----	<20	----
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	1.0	3.8	----
Total Organic Carbon	----	0.5	%	----	----	0.6	2.2	----
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

				TP5_0.5-0.6_27/06/13	QC102_27/06/13	TP5_0.9-1.0_27/06/13	TP1_0.0-0.1_27/06/13	TP1_0.9-1.0_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088
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	----	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

				TP5_0.5-0.6_27/06/13	QC102_27/06/13	TP5_0.9-1.0_27/06/13	TP1_0.0-0.1_27/06/13	TP1_0.9-1.0_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088
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	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	----	<2	----
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)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	<0.5	----

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID		TP5_0.5-0.6_27/06/13	QC102_27/06/13	TP5_0.9-1.0_27/06/13	TP1_0.0-0.1_27/06/13	TP1_0.9-1.0_27/06/13
Client sampling date / time						27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued										
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 (WHO)	----	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
EP080/071: Total Petroleum Hydrocarbons										
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	<10	----		
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	<50	----		
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 2010 Draft										
C6 - C10 Fraction	----	10	mg/kg	<10	<10	----	<10	----		
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	<10	<10	----	<10	----		
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	<50	----		
>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	----		
EP080: BTEX										
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----		
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
EP080: BTEXN										
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	----	<0.5	----		
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	----	<0.2	----		
Naphthalene	91-20-3	1	mg/kg	<1	<1	----	<1	----		
EP068S: Organochlorine Pesticide Surrogate										
Dibromo-DDE	21655-73-2	0.1	%	97.3	88.6	----	85.0	----		
EP068T: Organophosphorus Pesticide Surrogate										



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP5_0.5-0.6_27/06/13	QC102_27/06/13	TP5_0.9-1.0_27/06/13	TP1_0.0-0.1_27/06/13	TP1_0.9-1.0_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-082	EW1301886-083	EW1301886-084	EW1301886-086	EW1301886-088
EP068T: Organophosphorus Pesticide Surrogate - Continued								
DEF	78-48-8	0.1	%	104	97.8	----	92.3	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	92.5	91.6	----	99.0	----
2-Chlorophenol-D4	93951-73-6	0.1	%	95.4	97.9	----	107	----
2,4,6-Tribromophenol	118-79-6	0.1	%	96.3	96.1	----	106	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	103	105	----	117	----
Anthracene-d10	1719-06-8	0.1	%	99.8	95.7	----	116	----
4-Terphenyl-d14	1718-51-0	0.1	%	92.5	86.9	----	108	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	92.0	92.3	----	112	----
Toluene-D8	2037-26-5	0.1	%	102	86.1	----	90.8	----
4-Bromofluorobenzene	460-00-4	0.1	%	98.4	80.7	----	84.4	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP2_0.0-0.1_27/06/13	TP2_0.2-0.4_27/06/13	TP3_0.0-0.1_27/06/13	TP3_0.5-0.6_27/06/13	TP4_0.0-0.1_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-089	EW1301886-090	EW1301886-092	EW1301886-093	EW1301886-095
EA002 : pH (Soils)								
pH Value	----	0.1	pH Unit	----	----	----	5.2	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	17.1	31.6	30.5	30.9	26.5
EA150: Soil Classification based on Particle Size								
Clay (<2 µm)	----	1	%	----	----	----	54	----
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	1	--	----	----	-	----	----
Sample weight (dry)	----	0.01	g	----	----	599	----	----
APPROVED IDENTIFIER:	----	1	--	----	----	C.OWLER	----	----
EA200Q: Asbestos Quantification (non-NATA)								
Weight Used for % Calculation	----	0.0001	kg	----	----	6.00	----	----
Asbestos Containing Material	1332-21-4	0.1	g	----	----	<0.1	----	----
Fibrous Asbestos	----	0.002	g	----	----	<0.002	----	----
Asbestos Fines	1332-21-4	-	-	----	----	No	----	----
Asbestos Containing Material (ACM >7mm)	1332-21-4	0.01	%	----	----	<0.01	----	----
Asbestos Fines and Fibrous Asbestos (<7mm)	1332-21-4	0.001	%	----	----	<0.001	----	----
ED008: Exchangeable Cations								
Exchangeable Calcium	----	0.1	meq/100g	----	----	----	3.6	----
Exchangeable Magnesium	----	0.1	meq/100g	----	----	----	9.1	----
Exchangeable Potassium	----	0.1	meq/100g	----	----	----	0.2	----
Exchangeable Sodium	----	0.1	meq/100g	----	----	----	2.9	----
Cation Exchange Capacity	----	0.1	meq/100g	----	----	----	15.8	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	8	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	3	<1	<1
Chromium	7440-47-3	2	mg/kg	10	20	7	25	3
Copper	7440-50-8	5	mg/kg	10	82	589	80	287
Iron	7439-89-6	50	mg/kg	----	----	----	59000	----
Lead	7439-92-1	5	mg/kg	9	7	120	12	126
Manganese	7439-96-5	5	mg/kg	428	<5	135	19	216
Nickel	7440-02-0	2	mg/kg	7	3	6	4	2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP2_0.0-0.1_27/06/13	TP2_0.2-0.4_27/06/13	TP3_0.0-0.1_27/06/13	TP3_0.5-0.6_27/06/13	TP4_0.0-0.1_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-089	EW1301886-090	EW1301886-092	EW1301886-093	EW1301886-095
EG005T: Total Metals by ICP-AES - Continued								
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	18	12	152	25	32
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	<20	----	<20
EP004: Organic Matter								
Organic Matter	----	0.5	%	----	----	----	1.9	----
Total Organic Carbon	----	0.5	%	----	----	----	1.1	----
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
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP2_0.0-0.1_27/06/13	TP2_0.2-0.4_27/06/13	TP3_0.0-0.1_27/06/13	TP3_0.5-0.6_27/06/13	TP4_0.0-0.1_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-089	EW1301886-090	EW1301886-092	EW1301886-093	EW1301886-095
EP068A: Organochlorine Pesticides (OC) - Continued								
^ 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	----	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
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	<0.5	----	<0.5



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP2_0.0-0.1_27/06/13	TP2_0.2-0.4_27/06/13	TP3_0.0-0.1_27/06/13	TP3_0.5-0.6_27/06/13	TP4_0.0-0.1_27/06/13
				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-089	EW1301886-090	EW1301886-092	EW1301886-093	EW1301886-095
EP075(SIM)A: Phenolic Compounds - Continued								
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	<2	----	<2
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)fluoranthene	205-99-2	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 (WHO)	----	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	----	<10	<10	----	<10
C10 - C14 Fraction	----	50	mg/kg	----	<50	<50	----	<50
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 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	----	<10	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	----	<10	<10	----	<10
>C10 - C16 Fraction	----	50	mg/kg	----	<50	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	----	<100	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg	----	<100	<100	----	<100



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP2_0.0-0.1_27/06/13	TP2_0.2-0.4_27/06/13	TP3_0.0-0.1_27/06/13	TP3_0.5-0.6_27/06/13	TP4_0.0-0.1_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 10:00
Compound	CAS Number	LOR	Unit	EW1301886-089	EW1301886-090	EW1301886-092	EW1301886-093	EW1301886-095
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	<50	----	<50
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	----	<0.2
Toluene	108-88-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	<0.5	----	<0.5
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	<0.2	----	<0.2
Naphthalene	91-20-3	1	mg/kg	----	<1	<1	----	<1
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	106	94.3	----	92.0
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	110	100	----	99.8
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	91.7	88.0	----	95.1
2-Chlorophenol-D4	93951-73-6	0.1	%	----	92.4	97.6	----	103
2,4,6-Tribromophenol	118-79-6	0.1	%	----	98.1	109	----	100
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	110	106	----	112
Anthracene-d10	1719-06-8	0.1	%	----	99.7	105	----	102
4-Terphenyl-d14	1718-51-0	0.1	%	----	86.7	98.0	----	96.5
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	90.9	91.3	----	91.0
Toluene-D8	2037-26-5	0.1	%	----	84.3	82.8	----	83.5
4-Bromofluorobenzene	460-00-4	0.1	%	----	80.2	70.6	----	76.2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP4_0.5-0.6_27/06/13	QC402_27/06/13	OL1_0.0-0.2_27/06/13	OL1_0.3-0.5_27/06/13	OL2_0.0-0.2_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 15:00	27-JUN-2013 15:00	27-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-096	EW1301886-098	EW1301886-100	EW1301886-101	EW1301886-102
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	17.9	2.8	23.3	25.0	21.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	<5	<5	<5	32
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	8
Chromium	7440-47-3	2	mg/kg	16	<2	17	21	10
Copper	7440-50-8	5	mg/kg	78	<5	48	66	1150
Lead	7439-92-1	5	mg/kg	22	<5	10	9	383
Manganese	7439-96-5	5	mg/kg	21	8	24	12	148
Nickel	7440-02-0	2	mg/kg	3	<2	3	5	12
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Zinc	7440-66-6	5	mg/kg	16	<5	13	20	498
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	----	----	----
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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				TP4_0.5-0.6_27/06/13	QC402_27/06/13	OL1_0.0-0.2_27/06/13	OL1_0.3-0.5_27/06/13	OL2_0.0-0.2_27/06/13
				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 15:00	27-JUN-2013 15:00	27-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-096	EW1301886-098	EW1301886-100	EW1301886-101	EW1301886-102
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	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	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

				TP4_0.5-0.6_27/06/13	QC402_27/06/13	OL1_0.0-0.2_27/06/13	OL1_0.3-0.5_27/06/13	OL2_0.0-0.2_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 15:00	27-JUN-2013 15:00	27-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-096	EW1301886-098	EW1301886-100	EW1301886-101	EW1301886-102
EP075(SIM)A: Phenolic Compounds - Continued								
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	----	----	----
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)fluoranthene	205-99-2	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 (WHO)	----	0.5	mg/kg	----	<0.5	----	----	----
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

				TP4_0.5-0.6_27/06/13	QC402_27/06/13	OL1_0.0-0.2_27/06/13	OL1_0.3-0.5_27/06/13	OL2_0.0-0.2_27/06/13
Client sampling date / time				27-JUN-2013 10:00	27-JUN-2013 10:00	27-JUN-2013 15:00	27-JUN-2013 15:00	27-JUN-2013 15:00
Compound	CAS Number	LOR	Unit	EW1301886-096	EW1301886-098	EW1301886-100	EW1301886-101	EW1301886-102
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	----	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	10	mg/kg	----	<10	----	----	----
>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	----	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	----	----
EP080: BTEXN								
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	----	----	----
Naphthalene	91-20-3	1	mg/kg	----	<1	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	104	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	102	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	87.6	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	98.8	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	----	93.7	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	102	----	----	----
Anthracene-d10	1719-06-8	0.1	%	----	99.6	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	94.5	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	116	----	----	----
Toluene-D8	2037-26-5	0.1	%	----	102	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	95.8	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

OL2_0.3-0.5_27/06/13

Client sampling date / time

27-JUN-2013 15:00

Compound	CAS Number	LOR	Unit	EW1301886-103	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	30.8	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	20	----	----	----	----
Copper	7440-50-8	5	mg/kg	111	----	----	----	----
Lead	7439-92-1	5	mg/kg	18	----	----	----	----
Manganese	7439-96-5	5	mg/kg	26	----	----	----	----
Nickel	7440-02-0	2	mg/kg	6	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Zinc	7440-66-6	5	mg/kg	78	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				QC300_25/06/13	QC301_26/06/13	QC302_27/06/13	----	----
Client sampling date / time				25-JUN-2013 15:00	26-JUN-2013 15:00	27-JUN-2013 10:00	----	----
Compound	CAS Number	LOR	Unit	EW1301886-022	EW1301886-072	EW1301886-099	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	----	----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5	----	----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
4,4'-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	<2.0	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	<2.0	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				QC300_25/06/13	QC301_26/06/13	QC302_27/06/13	----	----
Client sampling date / time				25-JUN-2013 15:00	26-JUN-2013 15:00	27-JUN-2013 10:00	----	----
Compound	CAS Number	LOR	Unit	EW1301886-022	EW1301886-072	EW1301886-099	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
^ Sum of DDD + DDE + DDT	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	<2.0	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	<2.0	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	<2.0	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				QC300_25/06/13	QC301_26/06/13	QC302_27/06/13	----	----
Client sampling date / time				25-JUN-2013 15:00	26-JUN-2013 15:00	27-JUN-2013 10:00	----	----
Compound	CAS Number	LOR	Unit	EW1301886-022	EW1301886-072	EW1301886-099	----	----
EP075(SIM)A: Phenolic Compounds - Continued								
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1,2,3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (WHO)	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				QC300_25/06/13	QC301_26/06/13	QC302_27/06/13	----	----
Client sampling date / time				25-JUN-2013 15:00	26-JUN-2013 15:00	27-JUN-2013 10:00	----	----
Compound	CAS Number	LOR	Unit	EW1301886-022	EW1301886-072	EW1301886-099	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft - Continued								
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	106	58.9	90.0	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	78.8	57.5	85.5	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	40.3	41.7	40.2	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	63.7	81.2	78.2	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	80.0	89.2	79.4	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	75.6	85.7	76.5	----	----
Anthracene-d10	1719-06-8	0.1	%	75.1	84.8	77.1	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	67.6	74.1	67.9	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	80.6	82.4	82.1	----	----
Toluene-D8	2037-26-5	0.1	%	85.9	89.8	87.1	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	93.9	103	94.3	----	----



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	TP20_0.5-0.6_26/06/13 - 26-JUN-2013 10:00	Mid grey-brown clay soil with some grey rocks plus some glass debris and several small friable fragments of asbestos fibre board approx 5 x 5 x 2mm
EA200: Description	TP16A_0.9-1.0_26/06/13 - 26-JUN-2013 10:00	Three pieces of bonded asbestos cement sheeting approx 118 x 40 x 5mm
EA200: Description	TP16B_0.1-0.2_26/06/13 - 26-JUN-2013 10:00	Several pieces of bonded asbestos cement sheeting approx 45 x 30 x 5mm
EA200: Description	TP15_0.0-0.1_26/06/13 - 26-JUN-2013 10:00	Mid brown clay soil with some slag grains plus plenty of vegetation and one small piece of degraded and friable asbestos fibre board approx 6 x 5 x 3mm
EA200: Description	TP10_0.0-0.1_26/06/13 - 26-JUN-2013 15:00	Mid brown clay soil with some grey rocks plus some concrete debris and plenty of pieces of bonded asbestos vinyl tile like material approx 40 x 25 x 3mm and several small friable asbestos fibre bundles approx 4 x 1 x 1mm
EA200: Description	TP11_0.1-0.2_26/06/13 - 26-JUN-2013 15:00	Mid brown clay soil with some concrete debris plus some slag grains and two small fragments of bonded asbestos cement sheeting approx 6 x 4 x 3mm
EA200: Description	TP12A_0.1-0.2_26/06/13 - 26-JUN-2013 15:00	One piece of bonded asbestos cement sheeting approx 90 x 39 x 5mm
EA200: Description	TP12_0.0-0.1_26/06/13 - 26-JUN-2013 15:00	Mid grey-brown clay soil with some quartz and slag grains and plenty of vegetation
EA200: Description	TP7_0.3-0.4_27/06/13 - 27-JUN-2013 10:00	Dark grey-brown clay soil with some small red rocks plus some vegetation
EA200: Description	TP3_0.0-0.1_27/06/13 - 27-JUN-2013 10:00	Dark grey-brown clay soil with some small grey rocks plus some vegetation



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	145
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	32	142
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	127
2-Chlorophenol-D4	93951-73-6	64	126
2,4,6-Tribromophenol	118-79-6	36	136
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	64	130
Anthracene-d10	1719-06-8	69	135
4-Terphenyl-d14	1718-51-0	64	136
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	30	120
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	26.8	129
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	15.9	102
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20.4	112
Anthracene-d10	1719-06-8	29.6	118
4-Terphenyl-d14	1718-51-0	21.5	126
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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: EW1301886	Page	: 1 of 36
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division NSW South Coast
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 99 Kenny Street, Wollongong 2500 Unit 4 / 13 Geary Place, PO Box 3105, North Nowra 2541 AUSTRALIA
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PKC-PRIMARY SCHOOL	Date Samples Received	: 27-JUN-2013
C-O-C number	: ----	Issue Date	: 10-JUL-2013
Sampler	: KE YE	No. of samples received	: 103
Order number	: ----	No. of samples analysed	: 64
Quote number	: ----		

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

This Quality Control Report contains the following information:

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



General Comments

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

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

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

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

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



NATA Accredited
 Laboratory 825

Accredited for
 compliance with
 ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
		Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos
Di-An Dao		Sydney Inorganics
Edwandy Fadjjar	Organic Coordinator	Sydney Inorganics
Hamish Murray	Supervisor - Soils	Newcastle - Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
		Sydney Organics
		Sydney Organics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics
		Sydney Organics



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

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 (%)
EA002 : pH (Soils) (QC Lot: 2945308)									
ES1314693-001	Anonymous	EA002: pH Value	----	0.1	pH Unit	4.3	4.3	0.0	0% - 20%
EW1301886-024	TP25_0.0-0.1_26/06/13	EA002: pH Value	----	0.1	pH Unit	5.6	5.7	1.8	0% - 20%
EA002 : pH (Soils) (QC Lot: 2945314)									
EW1301886-084	TP5_0.9-1.0_27/06/13	EA002: pH Value	----	0.1	pH Unit	5.3	5.2	0.0	0% - 20%
EA055: Moisture Content (QC Lot: 2946255)									
ES1314992-003	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.5	10.8	14.6	0% - 50%
EW1301886-014	TP28_0.9-1.0_25/06/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	30.2	30.4	0.9	0% - 20%
EA055: Moisture Content (QC Lot: 2946256)									
EW1301886-034	TP20_0.5-0.6_26/06/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	29.8	27.8	6.8	0% - 20%
EA055: Moisture Content (QC Lot: 2946353)									
EW1301886-056	TP10_0.0-0.1_26/06/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	31.2	31.4	0.8	0% - 20%
EW1301886-075	TP7_0.5-0.6_27/06/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	33.8	32.9	2.9	0% - 20%
EA055: Moisture Content (QC Lot: 2946354)									
EW1301886-090	TP2_0.2-0.4_27/06/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	31.6	32.8	4.0	0% - 20%
ED008: Exchangeable Cations (QC Lot: 2949490)									
EW1301886-005	TP29_0.3-0.4_25/06/13	ED008: Exchangeable Calcium	----	0.1	meq/100g	1.2	1.2	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	1.1	1.3	18.2	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	0.2	0.3	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	2.5	2.8	11.0	0% - 20%
EW1301886-061	TP11_0.9-1.0_26/06/13	ED008: Exchangeable Calcium	----	0.1	meq/100g	0.7	0.7	0.0	0% - 20%
		ED008: Exchangeable Magnesium	----	0.1	meq/100g	12.6	12.7	0.0	0% - 20%
		ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	<0.1	0.0	0% - 20%
		ED008: Exchangeable Sodium	----	0.1	meq/100g	6.3	6.3	0.0	0% - 20%
		ED008: Cation Exchange Capacity	----	0.1	meq/100g	19.7	19.8	0.0	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2946073)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EG005T: Cadmium	7440-43-9	1	mg/kg	10	10	0.0	0% - 50%
		EG005T: Chromium	7440-47-3	2	mg/kg	13	15	15.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	11	11	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	201	272	# 30.0	0% - 20%
		EG005T: Copper	7440-50-8	5	mg/kg	2820	3370	17.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	657	766	15.3	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	296	359	19.1	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	7	9	15.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	415	565	# 30.7	0% - 20%

Page : 4 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2946073) - continued									
EW1301886-001	TP30_0.0-0.1_25/06/13	EG005T: Iron	7439-89-6	50	mg/kg	42500	49900	16.1	0% - 20%
EW1301886-023	QC400_25/06/13	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	10	10	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	1410	1370	2.9	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2946075)									
EW1301886-042	TP15_0.0-0.1_26/06/13	EG005T: Cadmium	7440-43-9	1	mg/kg	4	4	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	8	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	10	10	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	13	44.8	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	1620	1350	18.1	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	239	266	10.7	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	549	577	4.9	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	231	231	0.0	0% - 20%
		EG005T: Iron	7439-89-6	50	mg/kg	13200	13600	2.7	0% - 20%
EW1301886-059	TP11_0.1-0.2_26/06/13	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	19	13	40.4	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	7	32.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	201	179	11.7	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	21	45	70.9	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	39	57	37.7	0% - 50%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	92	94	2.2	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	21000	23200	10.1	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 2946883)									
ES1314698-019	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	7	7	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	4	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	26	24	4.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	204	191	6.6	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 (%)
EG005T: Total Metals by ICP-AES (QC Lot: 2946883) - continued									
ES1314698-019	Anonymous	EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	62	57	8.2	0% - 50%
		EG005T: Iron	7439-89-6	50	mg/kg	12500	12100	2.9	0% - 20%
EW1301886-090	TP2_0.2-0.4_27/06/13	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	21	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	82	91	10.0	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	7	6	0.0	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	12	12	0.0	No Limit
		EG005T: Iron	7439-89-6	50	mg/kg	47200	53000	11.6	0% - 20%
		EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2946074)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	1.2	1.1	8.5	0% - 50%
EW1301886-023	QC400_25/06/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2946076)									
EW1301886-042	TP15_0.0-0.1_26/06/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.3	49.9	No Limit
EW1301886-059	TP11_0.1-0.2_26/06/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2946884)									
ES1314698-019	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EW1301886-090	TP2_0.2-0.4_27/06/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK055: Ammonia as N (QC Lot: 2954700)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EW1301886-034	TP20_0.5-0.6_26/06/13	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK055: Ammonia as N (QC Lot: 2954701)									
EW1301886-067	TP8_0.0-0.1_26/06/13	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2945313)									
EW1301886-017	TP26_0.5-0.6_25/06/13	EK057G: Nitrite as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2945310)									
ES1314693-001	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	0.3	0.3	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2946169)									
ES1314487-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	60	60	0.0	No Limit
EW1301886-017	TP26_0.5-0.6_25/06/13	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	1040	1040	0.0	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2946170)									
EW1301886-017	TP26_0.5-0.6_25/06/13	EK067G: Total Phosphorus as P	----	2	mg/kg	261	345	# 27.7	0% - 20%
EP004: Organic Matter (QC Lot: 2945812)									



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 (%)
EP004: Organic Matter (QC Lot: 2945812) - continued									
EW1301886-005	TP29_0.3-0.4_25/06/13	EP004: Organic Matter	----	0.5	%	2.5	2.4	5.4	No Limit
		EP004: Total Organic Carbon	----	0.5	%	1.4	1.4	0.0	No Limit
EW1301886-067	TP8_0.0-0.1_26/06/13	EP004: Organic Matter	----	0.5	%	5.1	5.3	3.4	0% - 50%
		EP004: Total Organic Carbon	----	0.5	%	3.0	3.1	3.4	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2945212)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2945212) - continued									
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2945213)									
EW1301886-070	QC101_26/06/13	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 2945213) - continued									
EW1301886-095	TP4_0.0-0.1_27/06/13	EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2945212)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit

Page : 9 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2945212) - continued									
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2945213)									
EW1301886-070	QC101_26/06/13	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 2945213) - continued									
EW1301886-095	TP4_0.0-0.1_27/06/13	EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2945210)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2945215)									
EW1301886-070	QC101_26/06/13	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)A: Phenolic Compounds (QC Lot: 2945215) - continued									
EW1301886-070	QC101_26/06/13	EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EW1301886-090	TP2_0.2-0.4_27/06/13	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
		EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2945210)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.9	0.6	35.9	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.9	0.6	38.6	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.8	1.2	40.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



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: 2945210) - continued									
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2945215)									
EW1301886-070	QC101_26/06/13	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EW1301886-090	TP2_0.2-0.4_27/06/13	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



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: 2945215) - continued									
EW1301886-090	TP2_0.2-0.4_27/06/13	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2945209)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2945214)									
EW1301886-070	QC101_26/06/13	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EW1301886-090	TP2_0.2-0.4_27/06/13	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2945216)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2945940)									
EW1301886-070	QC101_26/06/13	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945209)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945209) - continued									
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945214)									
EW1301886-070	QC101_26/06/13	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EW1301886-090	TP2_0.2-0.4_27/06/13	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945216)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945940)									
EW1301886-070	QC101_26/06/13	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EP080: C6 - C10 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 2945216)									
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EW1301886-038	TP16A_0.2-0.3_26/06/13	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP080: BTEXN (QC Lot: 2945940)									
EW1301886-070	QC101_26/06/13	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EW1301886-095	TP4_0.0-0.1_27/06/13	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit

Page : 15 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2945940) - continued									
EW1301886-095	TP4_0.0-0.1_27/06/13	EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		106-42-3							
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 2946970)									
ES1314802-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.030	0.030	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.002	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES1314899-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.012	0.011	12.1	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.022	0.019	12.9	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.003	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.110	0.101	8.5	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.006	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.008	0.020	84.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2956347)									
EW1301886-022	QC300_25/06/13	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2945542)									
ES1314718-021	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	590	570	3.0	0% - 20%
ES1314711-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2945542)									
ES1314718-021	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	610	590	2.8	0% - 20%
ES1314711-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 2945542)									
ES1314718-021	Anonymous	EP080: Benzene	71-43-2	1	µg/L	480	472	1.6	0% - 20%
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit



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: 2945542) - continued									
ES1314718-021	Anonymous	EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
ES1314711-001	Anonymous	EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
		EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



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

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

Sub-Matrix: **SOIL**

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				
ED008: Exchangeable Cations (QCLot: 2949490)								
ED008: Exchangeable Calcium	----	0.1	meq/100g	<0.1	0.5 meq/100g	108	90	128
ED008: Exchangeable Magnesium	----	0.1	meq/100g	<0.1	0.86 meq/100g	101	86	120
ED008: Exchangeable Potassium	----	0.1	meq/100g	<0.1	0.26 meq/100g	102	85	135
ED008: Exchangeable Sodium	----	0.1	meq/100g	<0.1	0.87 meq/100g	96.0	86	128
ED008: Cation Exchange Capacity	----	0.1	meq/100g	<0.1	----	----	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2946073)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	104	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	101	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	106	86	128
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	88.4	70	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	81	123
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	110	85	127
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	111	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	123	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	114	81	133
EG005T: Total Metals by ICP-AES (QCLot: 2946075)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	110	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	102	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	100	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	105	86	128
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	90.5	70	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	106	81	123
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	105	85	127
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	108	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	122	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	110	81	133
EG005T: Total Metals by ICP-AES (QCLot: 2946883)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	111	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	107	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	95.8	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	109	86	128
EG005T: Iron	7439-89-6	50	mg/kg	<50	8400 mg/kg	87.2	70	130
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	103	81	123



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike	Spike Recovery (%)	Recovery Limits (%)	
					Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 2946883) - continued								
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	105	85	127
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	106	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	111	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	112	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946074)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	92.5	66	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946076)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	91.2	66	112
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946884)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	81.1	66	112
EK055: Ammonia as N (QCLot: 2954700)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	125 mg/kg	86.4	63	113
EK055: Ammonia as N (QCLot: 2954701)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	125 mg/kg	87.9	63	113
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2945313)								
EK057G: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	104	82	120
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2945310)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	110	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2946169)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	500 mg/kg	93.1	70	127
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2946170)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	93.9	69	124
EP004: Organic Matter (QCLot: 2945812)								
EP004: Organic Matter	----	0.5	%	<0.5	4.58 %	97.6	85	105
EP004: Total Organic Carbon	----	0.5	%	<0.5	2.66 %	97.4	84	106
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945212)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	98.0	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.5	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	108	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	80.2	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	84.0	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.8	57.3	120



Sub-Matrix: SOIL

Method: Compound				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
							Low	High
CAS Number	LOR	Unit	Result			LCS		
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945212) - continued								
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	87.4	67.4	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.1	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	66.1	117
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	106	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	63.6	119
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	108	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	80.6	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	111	50.4	132
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945213)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	60.8	116
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	103	59.4	115
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	79.4	59.8	117
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	110	59.8	118
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	65.8	114
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	65.6	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	67	113
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	95.4	65.6	113
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	60.7	113
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	84.8	65.8	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	57.3	120
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.8	67.4	116
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	98.3	67.5	114
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.4	63	121
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	66.1	117
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	94.2	65.3	116
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	97.5	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	63.6	119
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	98.1	58.4	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	63.6	117
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	102	50.4	132
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945212)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	77.7	25.5	124
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.8	10.1	159
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	86.9	2.88	149
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	100	48.6	126
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	64.9	111
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	88.7	65.1	111



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						
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945212) - continued								
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	98.7	61.4	113
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	103	60.4	127
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	82.3	64.7	110
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	64.2	111
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	99.4	60	116
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.9	64.8	111
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	61.4	123
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	81.0	64.3	114
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	87.9	45.5	128
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	65.4	111
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	62	116
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.9	59.5	119
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	100	29.8	137
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945213)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	80.3	25.5	124
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.9	10.1	159
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	84.6	2.88	149
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	48.6	126
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	93.7	64.9	111
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	93.5	65.1	111
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	102	61.4	113
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	91.5	60.4	127
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	64.7	110
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.9	64.2	111
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	99.8	60	116
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	94.9	64.8	111
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	61.4	123
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	97.4	64.3	114
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	91.1	45.5	128
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	94.8	65.4	111
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	62	116
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	98.6	59.5	119
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	61.9	29.8	137
EP075(SIM)A: Phenolic Compounds (QCLot: 2945210)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	90.2	73.9	115
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	87.0	80.2	115
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	93.5	76.8	114
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	90.8	72	119
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	74.2	60.3	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				
EP075(SIM)A: Phenolic Compounds (QCLot: 2945210) - continued								
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	89.8	74.5	119
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	88.1	71.6	113
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	91.1	74.8	115
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	85.9	76.4	114
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	78.9	62.2	115
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	81.3	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	47.0	1.23	91.6
EP075(SIM)A: Phenolic Compounds (QCLot: 2945215)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	95.6	73.9	115
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	94.4	80.2	115
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	99.8	76.8	114
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	102	72	119
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	78.4	60.3	117
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	88.6	74.5	119
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	90.2	71.6	113
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	98.3	74.8	115
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	90.7	76.4	114
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	85.7	62.2	115
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	80.9	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	41.6	1.23	91.6
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945210)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	97.3	81.9	113
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	95.8	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	94.5	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	94.5	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	100	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	100	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	99.3	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	102	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	90.4	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	94.6	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	89.8	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	97.3	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	91.5	76.4	113
EP075(SIM): Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	97.0	71	113
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	97.1	71.7	113
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	100	72.4	114
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945215)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	104	81.9	113

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				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945215) - continued								
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	103	79.6	113
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	101	81.5	112
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	106	79.9	112
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	107	79.4	114
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	81.1	112
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	108	78.8	113
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	111	78.9	113
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	98.1	77.2	112
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	102	79.8	114
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	95.9	71.8	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	104	74.2	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	99.8	76.4	113
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	106	71	113
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	107	71.7	113
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	107	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945209)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	104	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	109	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	91.8	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945214)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	97.8	59	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	99.0	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	99.7	63	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945216)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	116	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945940)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	84.7	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945209)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	99.6	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	106	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	77.1	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945214)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	105	59	131
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	96.3	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
		50	mg/kg	----	150 mg/kg	97.8	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945216)								



Sub-Matrix: **SOIL**

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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945216) - continued								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	116	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945940)								
EP080: C6 - C10 Fraction	----	10	mg/kg	<10	31 mg/kg	82.4	68.4	128
EP080: BTEXN (QCLot: 2945216)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	102	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	107	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	105	58	118
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	102	60	120
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	103	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	115	62	138
EP080: BTEXN (QCLot: 2945940)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	83.6	62	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	89.1	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	84.4	58	118
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	80.8	60	120
	106-42-3							
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	90.2	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	86.8	62	138

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) LowHigh	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 2946970)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	113	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	112	82	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	109	83	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	107	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	105	85	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	109	83	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	106	83	117
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.3	68	128
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	111	76	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2956347)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	106	77	115
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945332)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	80.9	61	117
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	93.4	56	116
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	76.3	60	118



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit						
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945332) - continued								
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	91.8	62	118
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	81.8	64	116
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	83.1	63	117
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	81.2	65	121
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	79.7	63	117
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	80.6	64	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	75.5	67	119
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	80.0	63	123
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	81.0	64	122
EP068: 4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	74.9	64	118
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	76.1	64	126
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	77.0	68	122
EP068: 4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	80.3	66	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	79.6	62	112
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	77.0	60	124
EP068: 4,4'-DDT	50-29-3	2.0	µg/L	<2.0	5 µg/L	79.8	54	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	76.7	55	119
EP068: Methoxychlor	72-43-5	2.0	µg/L	<2.0	5 µg/L	82.6	53	127
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945332)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	83.6	52	128
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	81.3	28.4	150
EP068: Monocrotophos	6923-22-4	0.5	µg/L	----	5 µg/L	26.7	10	89.1
		2.0	µg/L	<2.0	----	----	----	----
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	84.4	61	117
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	78.9	64	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	80.2	67	121
EP068: Parathion-methyl	298-00-0	2.0	µg/L	<2.0	5 µg/L	86.3	59	123
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	79.5	57	123
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	81.3	67	119
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	80.0	67	121
EP068: Parathion	56-38-2	2.0	µg/L	<2.0	5 µg/L	83.7	64	118
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	75.4	64	118
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	86.0	59	123
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	81.8	62	122
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	76.6	59	131
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	79.6	64	116
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	79.6	68	120
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	78.8	62	120
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	63.1	39	131



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)A: Phenolic Compounds (QCLot: 2945331)								
EP075(SIM): Phenol	108-95-2	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	43.3 ----	24.5 ----	61.9 ----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	89.1 ----	63.8 ----	110 ----
EP075(SIM): 2-Methylphenol	95-48-7	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	69.7 ----	55.9 ----	112 ----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4 2	µg/L µg/L	---- <2.0	40 µg/L ----	82.8 ----	42.5 ----	114 ----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	93.3 ----	62.7 ----	117 ----
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	93.3 ----	59.9 ----	112 ----
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	94.7 ----	59.3 ----	122 ----
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	92.6 ----	64.3 ----	118 ----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	90.8 ----	63 ----	119 ----
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	89.1 ----	58.7 ----	118 ----
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	87.8 ----	51.2 ----	118 ----
EP075(SIM): Pentachlorophenol	87-86-5	0.4 2	µg/L µg/L	---- <2.0	40 µg/L ----	49.7 ----	6.85 ----	95.6 ----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945331)								
EP075(SIM): Naphthalene	91-20-3	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	98.1 ----	58.6 ----	119 ----
EP075(SIM): Acenaphthylene	208-96-8	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	103 ----	63.6 ----	114 ----
EP075(SIM): Acenaphthene	83-32-9	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	102 ----	62.2 ----	113 ----
EP075(SIM): Fluorene	86-73-7	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	105 ----	63.9 ----	115 ----
EP075(SIM): Phenanthrene	85-01-8	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	96.3 ----	62.6 ----	116 ----
EP075(SIM): Anthracene	120-12-7	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	94.7 ----	64.3 ----	116 ----
EP075(SIM): Fluoranthene	206-44-0	0.2 1	µg/L µg/L	---- <1.0	20 µg/L ----	99.3 ----	63.6 ----	118 ----



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: 2945331) - continued								
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	20 µg/L	99.6	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	20 µg/L	103	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	20 µg/L	104	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	20 µg/L	91.2	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	20 µg/L	102	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	20 µg/L	105	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	20 µg/L	101	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.2	µg/L	----	20 µg/L	102	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	20 µg/L	97.6	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945330)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	76.8	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	122	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	91.0	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945542)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	112	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945330)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	92.8	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	112	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	86.8	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945542)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	116	75	127
EP080: BTEXN (QCLot: 2945542)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	110	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	94.7	66	132
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	94.7	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	94.0	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	91.1	72	122

Page : 27 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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				
EP080: BTEXN (QCLot: 2945542) - continued								
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	89.0	70	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

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: 2946073)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EG005T: Arsenic	7440-38-2	50 mg/kg	# 29.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	112	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	# Not Determined	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	# 210	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	107	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	98.3	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	# 429	70	130
EG005T: Total Metals by ICP-AES (QCLot: 2946075)							
EW1301886-042	TP15_0.0-0.1_26/06/13	EG005T: Arsenic	7440-38-2	50 mg/kg	107	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	110	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	# Not Determined	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	105	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	94.7	70	130
EG005T: Total Metals by ICP-AES (QCLot: 2946883)							
ES1314698-019	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	108	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	108	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	104	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	107	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	104	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
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946074)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EG035T: Mercury	7439-97-6	5 mg/kg	108	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946076)							
EW1301886-042	TP15_0.0-0.1_26/06/13	EG035T: Mercury	7439-97-6	5 mg/kg	112	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946884)							
ES1314698-019	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	70	130
EK055: Ammonia as N (QCLot: 2954700)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	73.2	70	130
EK055: Ammonia as N (QCLot: 2954701)							
EW1301886-067	TP8_0.0-0.1_26/06/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	75.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2945313)							
EW1301886-017	TP26_0.5-0.6_25/06/13	EK057G: Nitrite as N (Sol.)	----	2.5 mg/kg	120	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2945310)							
ES1314693-001	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	81.0	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2946169)							
EW1301886-017	TP26_0.5-0.6_25/06/13	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	84.3	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2946170)							
EW1301886-017	TP26_0.5-0.6_25/06/13	EK067G: Total Phosphorus as P	----	100 mg/kg	96.1	70	130
EP004: Organic Matter (QCLot: 2945812)							
EW1301886-005	TP29_0.3-0.4_25/06/13	EP004: Organic Matter	----	4.58 %	3.6	----	----
		EP004: Total Organic Carbon	----	2.66 %	3.6	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945212)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: gamma-BHC	58-89-9	0.5 mg/kg	108	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	108	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	104	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	108	70	130
		EP068: Endrin	72-20-8	2 mg/kg	85.3	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	104	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945213)							
EW1301886-070	QC101_26/06/13	EP068: gamma-BHC	58-89-9	0.5 mg/kg	80.1	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	83.7	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	85.7	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	81.8	70	130
		EP068: Endrin	72-20-8	2 mg/kg	91.7	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	90.7	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945212)							

Page : 29 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2945212) - continued							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: Diazinon	333-41-5	0.5 mg/kg	104	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	98.2	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	92.6	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	98.7	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	79.3	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945213)							
EW1301886-070	QC101_26/06/13	EP068: Diazinon	333-41-5	0.5 mg/kg	84.2	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	78.5	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	71.8	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	78.8	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	88.3	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2945210)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.4	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.2	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	88.2	60	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	98.2	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	82.1	20	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2945215)							
EW1301886-070	QC101_26/06/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.4	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	96.7	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	92.8	60	130
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	96.3	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	91.7	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945210)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	106	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	116	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945215)							
EW1301886-070	QC101_26/06/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	112	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945209)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: C10 - C14 Fraction	----	640 mg/kg	104	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	121	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.5	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945214)							
EW1301886-070	QC101_26/06/13	EP071: C10 - C14 Fraction	----	640 mg/kg	100	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	115	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.6	52	132

Page : 30 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945216)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C9 Fraction	----	32.5 mg/kg	118	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945940)							
EW1301886-070	QC101_26/06/13	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.0	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945209)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: >C10 - C16 Fraction	----	850 mg/kg	131	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	110	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945214)							
EW1301886-070	QC101_26/06/13	EP071: >C10 - C16 Fraction	----	850 mg/kg	128	73	137
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	104	53	131
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.6	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945216)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C10 Fraction	----	37.5 mg/kg	113	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945940)							
EW1301886-070	QC101_26/06/13	EP080: C6 - C10 Fraction	----	37.5 mg/kg	85.1	70	130
EP080: BTEXN (QCLot: 2945216)							
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: Benzene	71-43-2	2.5 mg/kg	76.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	81.3	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.3	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.5	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.9	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	106	70	130
EP080: BTEXN (QCLot: 2945940)							
EW1301886-070	QC101_26/06/13	EP080: Benzene	71-43-2	2.5 mg/kg	78.3	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	83.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.3	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	72.9	70	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	77.3	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	70.5	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: 2946970)							
EW1301886-022	QC300_25/06/13	EG020A-T: Arsenic	7440-38-2	1 mg/L	76.6	70	130

Page : 31 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2946970) - continued							
EW1301886-022	QC300_25/06/13	EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	107	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	107	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	104	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	108	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	104	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.6	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2956347)							
EW1301886-022	QC300_25/06/13	EG035T: Mercury	7439-97-6	0.010 mg/L	92.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945542)							
ES1314718-019	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	# Not Determined	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945542)							
ES1314718-019	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	# Not Determined	70	130
EP080: BTEXN (QCLot: 2945542)							
ES1314718-019	Anonymous	EP080: Benzene	71-43-2	25 µg/L	94.9	70	130
		EP080: Toluene	108-88-3	25 µg/L	93.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	109	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	# Not Determined	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	# Not Determined	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	73.9	70	130

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

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Lim
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945209)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: C10 - C14 Fraction	----	640 mg/kg	104	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	121	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	90.5	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945209)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: >C10 - C16 Fraction	----	850 mg/kg	131	----	73	137	----	----

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945209) - continued										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP071: >C16 - C34 Fraction	----	4800 mg/kg	110	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	60.6	----	52	132	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 2945210)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.4	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	90.2	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	88.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	98.2	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	82.1	----	20	130	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945210)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	106	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	116	----	70	130	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945212)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: gamma-BHC	58-89-9	0.5 mg/kg	108	----	70	130	----	----
		EP068: Heptachlor	76-44-8	0.5 mg/kg	108	----	70	130	----	----
		EP068: Aldrin	309-00-2	0.5 mg/kg	104	----	70	130	----	----
		EP068: Dieldrin	60-57-1	0.5 mg/kg	108	----	70	130	----	----
		EP068: Endrin	72-20-8	2 mg/kg	85.3	----	70	130	----	----
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	104	----	70	130	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945212)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP068: Diazinon	333-41-5	0.5 mg/kg	104	----	70	130	----	----
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	98.2	----	70	130	----	----
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	92.6	----	70	130	----	----
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	98.7	----	70	130	----	----
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	79.3	----	70	130	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 2945213)										
EW1301886-070	QC101_26/06/13	EP068: gamma-BHC	58-89-9	0.5 mg/kg	80.1	----	70	130	----	----
		EP068: Heptachlor	76-44-8	0.5 mg/kg	83.7	----	70	130	----	----
		EP068: Aldrin	309-00-2	0.5 mg/kg	85.7	----	70	130	----	----
		EP068: Dieldrin	60-57-1	0.5 mg/kg	81.8	----	70	130	----	----
		EP068: Endrin	72-20-8	2 mg/kg	91.7	----	70	130	----	----
		EP068: 4,4'-DDT	50-29-3	2 mg/kg	90.7	----	70	130	----	----
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2945213)										
EW1301886-070	QC101_26/06/13	EP068: Diazinon	333-41-5	0.5 mg/kg	84.2	----	70	130	----	----
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	78.5	----	70	130	----	----
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	71.8	----	70	130	----	----
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	78.8	----	70	130	----	----
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	88.3	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945214)										

Page : 33 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945214) - continued										
EW1301886-070	QC101_26/06/13	EP071: C10 - C14 Fraction	----	640 mg/kg	100	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	115	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	84.6	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945214)										
EW1301886-070	QC101_26/06/13	EP071: >C10 - C16 Fraction	----	850 mg/kg	128	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	104	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	58.6	----	52	132	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 2945215)										
EW1301886-070	QC101_26/06/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	93.4	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	96.7	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	92.8	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	10 mg/kg	96.3	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	91.7	----	20	130	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2945215)										
EW1301886-070	QC101_26/06/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	99.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	112	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945216)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C9 Fraction	----	32.5 mg/kg	118	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945216)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: C6 - C10 Fraction	----	37.5 mg/kg	113	----	70	130	----	----
EP080: BTEXN (QCLot: 2945216)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EP080: Benzene	71-43-2	2.5 mg/kg	76.8	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	81.3	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	80.3	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	81.5	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	81.9	----	70	130	----	----
	EP080: Naphthalene	91-20-3	2.5 mg/kg	106	----	70	130	----	----	
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2945310)										
ES1314693-001	Anonymous	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	81.0	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2945313)										
EW1301886-017	TP26_0.5-0.6_25/06/13	EK057G: Nitrite as N (Sol.)	----	2.5 mg/kg	120	----	70	130	----	----
EP004: Organic Matter (QCLot: 2945812)										
EW1301886-005	TP29_0.3-0.4_25/06/13	EP004: Organic Matter	----	4.58 %	3.6	----	----	----	----	----
		EP004: Total Organic Carbon	----	2.66 %	3.6	----	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945940)										
EW1301886-070	QC101_26/06/13	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.0	----	70	130	----	----

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945940)										
EW1301886-070	QC101_26/06/13	EP080: C6 - C10 Fraction	----	37.5 mg/kg	85.1	----	70	130	----	----
EP080: BTEXN (QCLot: 2945940)										
EW1301886-070	QC101_26/06/13	EP080: Benzene	71-43-2	2.5 mg/kg	78.3	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	83.8	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	78.3	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	72.9	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	77.3	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	70.5	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2946073)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EG005T: Arsenic	7440-38-2	50 mg/kg	# 29.3	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	102	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	112	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	# Not Determined	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	# 210	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	107	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	98.3	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	# 429	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946074)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EG035T: Mercury	7439-97-6	5 mg/kg	108	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2946075)										
EW1301886-042	TP15_0.0-0.1_26/06/13	EG005T: Arsenic	7440-38-2	50 mg/kg	107	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	110	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	100	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	# Not Determined	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	102	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	105	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	101	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	94.7	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946076)										
EW1301886-042	TP15_0.0-0.1_26/06/13	EG035T: Mercury	7439-97-6	5 mg/kg	112	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2946169)										
EW1301886-017	TP26_0.5-0.6_25/06/13	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	84.3	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2946170)										
EW1301886-017	TP26_0.5-0.6_25/06/13	EK067G: Total Phosphorus as P	----	100 mg/kg	96.1	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 2946883)										

Page : 35 of 36
 Work Order : EW1301886
 Client : PORT KEMBLA COPPER
 Project : 137623028



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG005T: Total Metals by ICP-AES (QCLot: 2946883) - continued										
ES1314698-019	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	108	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	108	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	108	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	104	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	107	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	106	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	104	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2946884)										
ES1314698-019	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	104	----	70	130	----	----
EK055: Ammonia as N (QCLot: 2954700)										
EW1301886-001	TP30_0.0-0.1_25/06/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	73.2	----	70	130	----	----
EK055: Ammonia as N (QCLot: 2954701)										
EW1301886-067	TP8_0.0-0.1_26/06/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	75.7	----	70	130	----	----

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2945542)										
ES1314718-019	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	# Not Determined	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2945542)										
ES1314718-019	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	# Not Determined	----	70	130	----	----
EP080: BTEXN (QCLot: 2945542)										
ES1314718-019	Anonymous	EP080: Benzene	71-43-2	25 µg/L	94.9	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	93.7	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	109	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	# Not Determined	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	25 µg/L	# Not Determined	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	73.9	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 2946970)										
EW1301886-022	QC300_25/06/13	EG020A-T: Arsenic	7440-38-2	1 mg/L	76.6	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	107	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1 mg/L	107	----	70	130	----	----



Sub-Matrix: WATER

Sub-Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EG020T: Total Metals by ICP-MS (QCLot: 2946970) - continued										
EW1301886-022	QC300_25/06/13	EG020A-T: Lead	7439-92-1	1 mg/L	104	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1 mg/L	108	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	104	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.6	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2956347)										
EW1301886-022	QC300_25/06/13	EG035T: Mercury	7439-97-6	0.010 mg/L	92.2	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: EW1301886	Page	: 1 of 25
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division NSW South Coast
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 99 Kenny Street, Wollongong 2500 Unit 4 / 13 Geary Place, PO Box 3105, North Nowra 2541 AUSTRALIA
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: PKC-PRIMARY SCHOOL	Date Samples Received	: 27-JUN-2013
C-O-C number	: ----	Issue Date	: 10-JUL-2013
Sampler	: KE YE	No. of samples received	: 103
Order number	: ----	No. of samples analysed	: 64
Quote number	: ----		

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA002 : pH (Soils)								
Soil Glass Jar - Unpreserved (EA002)								
TP29_0.3-0.4_25/06/13,	TP28_0.9-1.0_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	02-JUL-2013	02-JUL-2013	✓
Soil Glass Jar - Unpreserved (EA002)								
TP25_0.0-0.1_26/06/13,	TP24_0.5-0.6_26/06/13,	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	02-JUL-2013	02-JUL-2013	✓
TP20_0.5-0.6_26/06/13,	TP15_0.9-1.0_26/06/13,							
TP14_0.0-0.1_26/06/13,	TP9_0.5-0.6_26/06/13,							
TP10_0.0-0.1_26/06/13,	TP11_0.9-1.0_26/06/13,							
TP8_0.0-0.1_26/06/13								
Soil Glass Jar - Unpreserved (EA002)								
TP7_0.5-0.6_27/06/13,	TP5_0.9-1.0_27/06/13,	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	02-JUL-2013	02-JUL-2013	✓
TP1_0.0-0.1_27/06/13,	TP3_0.5-0.6_27/06/13							



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							
Snap Lock Bag (EA055-103) TP15_0.0-0.1_26/06/13	26-JUN-2013	----	----	----	02-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.0-0.1_25/06/13, TP28_0.0-0.1_25/06/13, TP26_0.5-0.6_25/06/13, QC400_25/06/13	25-JUN-2013	----	----	----	02-JUL-2013	09-JUL-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.9-1.0_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13, QC101_26/06/13,	26-JUN-2013	----	----	----	02-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EA055-103) TP7_0.3-0.4_27/06/13, TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, TP5_0.9-1.0_27/06/13, TP1_0.9-1.0_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.0-0.1_27/06/13, TP3_0.5-0.6_27/06/13, TP4_0.5-0.6_27/06/13, OL2_0.0-0.2_27/06/13,	27-JUN-2013	----	----	----	02-JUL-2013	11-JUL-2013	✓
			</				



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
EA150: Soil Classification based on Particle Size								
Snap Lock Bag (EA150H) TP25_0.0-0.1_26/06/13, TP20_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP10_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13	TP24_0.5-0.6_26/06/13, TP15_0.9-1.0_26/06/13, TP9_0.5-0.6_26/06/13, TP11_0.9-1.0_26/06/13,	26-JUN-2013	---	23-DEC-2013	----	05-JUL-2013	23-DEC-2013	✓
Snap Lock Bag (EA150H) TP7_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13,	TP5_0.9-1.0_27/06/13, TP3_0.5-0.6_27/06/13	27-JUN-2013	---	24-DEC-2013	----	05-JUL-2013	24-DEC-2013	✓
Soil Glass Jar - Unpreserved (EA150H) TP29_0.3-0.4_25/06/13,	TP28_0.9-1.0_25/06/13	25-JUN-2013	---	22-DEC-2013	----	05-JUL-2013	22-DEC-2013	✓
EA200: AS 4964 - 2004 Identification of Asbestos in bulk samples								
Miscellaneous Plastic Bucket (EA200) TP20_0.5-0.6_26/06/13, TP10_0.0-0.1_26/06/13, TP12_0.0-0.1_26/06/13	TP15_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13,	26-JUN-2013	---	23-DEC-2013	----	05-JUL-2013	01-JAN-2014	✓
Miscellaneous Plastic Bucket (EA200) TP7_0.3-0.4_27/06/13,	TP3_0.0-0.1_27/06/13	27-JUN-2013	---	24-DEC-2013	----	05-JUL-2013	01-JAN-2014	✓
Snap Lock Bag (EA200) TP16A_0.9-1.0_26/06/13, TP12A_0.1-0.2_26/06/13	TP16B_0.1-0.2_26/06/13,	26-JUN-2013	---	23-DEC-2013	----	05-JUL-2013	01-JAN-2014	✓
ED008: Exchangeable Cations								
Soil Glass Jar - Unpreserved (ED008) TP29_0.3-0.4_25/06/13,	TP28_0.9-1.0_25/06/13	25-JUN-2013	04-JUL-2013	23-JUL-2013	✓	08-JUL-2013	23-JUL-2013	✓
Soil Glass Jar - Unpreserved (ED008) TP25_0.0-0.1_26/06/13, TP20_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP10_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13	TP24_0.5-0.6_26/06/13, TP15_0.9-1.0_26/06/13, TP9_0.5-0.6_26/06/13, TP11_0.9-1.0_26/06/13,	26-JUN-2013	04-JUL-2013	24-JUL-2013	✓	08-JUL-2013	24-JUL-2013	✓
Soil Glass Jar - Unpreserved (ED008) TP7_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13,	TP5_0.9-1.0_27/06/13, TP3_0.5-0.6_27/06/13	27-JUN-2013	04-JUL-2013	25-JUL-2013	✓	08-JUL-2013	25-JUL-2013	✓



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									
Snap Lock Bag (EG005T) TP15_0.0-0.1_26/06/13			26-JUN-2013	02-JUL-2013	23-DEC-2013	✓	05-JUL-2013	23-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG005T) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.0-0.1_25/06/13, TP28_0.0-0.1_25/06/13, TP26_0.5-0.6_25/06/13, QC400_25/06/13			25-JUN-2013	02-JUL-2013	22-DEC-2013	✓	05-JUL-2013	22-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG005T) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.9-1.0_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13, QC101_26/06/13,			26-JUN-2013	02-JUL-2013	23-DEC-2013	✓	05-JUL-2013	23-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG005T) TP7_0.3-0.4_27/06/13,			27-JUN-2013	02-JUL-2013	24-DEC-2013	✓	05-JUL-2013	24-DEC-2013	✓
Soil Glass Jar - Unpreserved (EG005T) TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, TP5_0.9-1.0_27/06/13, TP1_0.9-1.0_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.5-0.6_27/06/13, TP4_0.0-0.1_27/06/13, TP4_0.5-0.6_27/06/13, OL2_0.0-0.2_27/06/13,			27-JUN-2013	03-JUL-2013	24-DEC-2013	✓	04-JUL-2013	24-DEC-2013	✓



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
EG035T: Total Recoverable Mercury by FIMS									
Snap Lock Bag (EG035T) TP15_0.0-0.1_26/06/13			26-JUN-2013	02-JUL-2013	24-JUL-2013	✓	05-JUL-2013	24-JUL-2013	✓
Soil Glass Jar - Unpreserved (EG035T) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.0-0.1_25/06/13, TP28_0.0-0.1_25/06/13, TP26_0.5-0.6_25/06/13, QC400_25/06/13			25-JUN-2013	02-JUL-2013	23-JUL-2013	✓	05-JUL-2013	23-JUL-2013	✓
Soil Glass Jar - Unpreserved (EG035T) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.9-1.0_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13, QC101_26/06/13,			26-JUN-2013	02-JUL-2013	24-JUL-2013	✓	05-JUL-2013	24-JUL-2013	✓
Soil Glass Jar - Unpreserved (EG035T) TP7_0.3-0.4_27/06/13,			27-JUN-2013	02-JUL-2013	25-JUL-2013	✓	05-JUL-2013	25-JUL-2013	✓
Soil Glass Jar - Unpreserved (EG035T) TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, TP5_0.9-1.0_27/06/13, TP1_0.9-1.0_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.5-0.6_27/06/13, TP4_0.0-0.1_27/06/13, TP4_0.5-0.6_27/06/13, OL2_0.0-0.2_27/06/13,			27-JUN-2013	03-JUL-2013	25-JUL-2013	✓	04-JUL-2013	25-JUL-2013	✓



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
EK055: Ammonia as N							
Snap Lock Bag (EK055) TP15_0.0-0.1_26/06/13	26-JUN-2013	----	----	----	08-JUL-2013	23-DEC-2013	✓
Soil Glass Jar - Unpreserved (EK055) TP30_0.0-0.1_25/06/13, TP27_0.5-0.6_25/06/13, TP26_0.5-0.6_25/06/13, QC400_25/06/13	25-JUN-2013	----	----	----	08-JUL-2013	22-DEC-2013	✓
Soil Glass Jar - Unpreserved (EK055) TP25_0.0-0.1_26/06/13, TP24_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP14_0.0-0.1_26/06/13, TP9_0.3-0.4_26/06/13, TP11_0.1-0.2_26/06/13, TP8_0.0-0.1_26/06/13, QC401_26/06/13	26-JUN-2013	----	----	----	08-JUL-2013	23-DEC-2013	✓
Soil Glass Jar - Unpreserved (EK055) TP7_0.3-0.4_27/06/13, TP5_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13, TP3_0.0-0.1_27/06/13, QC402_27/06/13	27-JUN-2013	----	----	----	08-JUL-2013	24-DEC-2013	✓
EK057G: Nitrite as N by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK057G) TP26_0.5-0.6_25/06/13,	25-JUN-2013	02-JUL-2013	22-DEC-2013	✓	02-JUL-2013	22-DEC-2013	✓
TP26_1.5-1.6_25/06/13							
Soil Glass Jar - Unpreserved (EK057G) TP20_0.5-0.6_26/06/13	26-JUN-2013	02-JUL-2013	23-DEC-2013	✓	02-JUL-2013	23-DEC-2013	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G) TP26_0.5-0.6_25/06/13,	25-JUN-2013	02-JUL-2013	22-DEC-2013	✓	02-JUL-2013	22-DEC-2013	✓
TP26_1.5-1.6_25/06/13							
Soil Glass Jar - Unpreserved (EK059G) TP20_0.5-0.6_26/06/13	26-JUN-2013	02-JUL-2013	23-DEC-2013	✓	02-JUL-2013	23-DEC-2013	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G) TP26_0.5-0.6_25/06/13,	25-JUN-2013	03-JUL-2013	22-DEC-2013	✓	03-JUL-2013	22-DEC-2013	✓
TP26_1.5-1.6_25/06/13							
Soil Glass Jar - Unpreserved (EK061G) TP20_0.5-0.6_26/06/13	26-JUN-2013	03-JUL-2013	23-DEC-2013	✓	03-JUL-2013	23-DEC-2013	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G) TP26_0.5-0.6_25/06/13,	25-JUN-2013	03-JUL-2013	22-DEC-2013	✓	03-JUL-2013	22-DEC-2013	✓
TP26_1.5-1.6_25/06/13							
Soil Glass Jar - Unpreserved (EK067G) TP20_0.5-0.6_26/06/13	26-JUN-2013	03-JUL-2013	23-DEC-2013	✓	03-JUL-2013	23-DEC-2013	✓



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
EP004: Organic Matter								
Soil Glass Jar - Unpreserved (EP004)								
TP29_0.3-0.4_25/06/13,	TP28_0.9-1.0_25/06/13	25-JUN-2013	09-JUL-2013	23-JUL-2013	✓	09-JUL-2013	23-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP004)								
TP25_0.0-0.1_26/06/13,	TP24_0.5-0.6_26/06/13,	26-JUN-2013	09-JUL-2013	24-JUL-2013	✓	09-JUL-2013	24-JUL-2013	✓
TP20_0.5-0.6_26/06/13,	TP15_0.9-1.0_26/06/13,							
TP14_0.0-0.1_26/06/13,	TP9_0.5-0.6_26/06/13,							
TP10_0.0-0.1_26/06/13,	TP11_0.9-1.0_26/06/13,							
TP8_0.0-0.1_26/06/13								
Soil Glass Jar - Unpreserved (EP004)								
TP7_0.5-0.6_27/06/13,	TP5_0.9-1.0_27/06/13,	27-JUN-2013	09-JUL-2013	25-JUL-2013	✓	09-JUL-2013	25-JUL-2013	✓
TP1_0.0-0.1_27/06/13,	TP3_0.5-0.6_27/06/13							
EP068A: Organochlorine Pesticides (OC)								
Snap Lock Bag (EP068)								
TP15_0.0-0.1_26/06/13		26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓
Soil Glass Jar - Unpreserved (EP068)								
TP30_0.0-0.1_25/06/13,	TP29_0.3-0.4_25/06/13,	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓
TP27_0.5-0.6_25/06/13,	TP28_0.0-0.1_25/06/13,							
TP26_1.5-1.6_25/06/13,	QC400_25/06/13							
Soil Glass Jar - Unpreserved (EP068)								
QC101_26/06/13,	QC401_26/06/13	26-JUN-2013	---	10-JUL-2013	----	04-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP068)								
TP25_0.0-0.1_26/06/13,	QC100_26/06/13,	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓
TP24_0.5-0.6_26/06/13,	TP20_0.5-0.6_26/06/13,							
TP16A_0.2-0.3_26/06/13,	TP16A_0.5-0.6_26/06/13,							
TP14_0.0-0.1_26/06/13,	TP13_0.5-0.6_26/06/13,							
TP9_0.3-0.4_26/06/13,	TP10_0.0-0.1_26/06/13,							
TP11_0.1-0.2_26/06/13,	TP12_0.0-0.1_26/06/13,							
TP8_0.0-0.1_26/06/13								
Soil Glass Jar - Unpreserved (EP068)								
TP7_0.3-0.4_27/06/13,	TP6_0.2-0.3_27/06/13,	27-JUN-2013	---	11-JUL-2013	----	04-JUL-2013	11-JUL-2013	✓
TP5_0.5-0.6_27/06/13,	QC102_27/06/13,							
TP1_0.0-0.1_27/06/13,	TP2_0.2-0.4_27/06/13,							
TP3_0.0-0.1_27/06/13,	TP4_0.0-0.1_27/06/13,							
QC402_27/06/13								



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	
EP068B: Organophosphorus Pesticides (OP)								
Snap Lock Bag (EP068) TP15_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓	
Soil Glass Jar - Unpreserved (EP068) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.5-0.6_25/06/13, TP28_0.0-0.1_25/06/13, TP26_1.5-1.6_25/06/13, QC400_25/06/13	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓	
Soil Glass Jar - Unpreserved (EP068) QC101_26/06/13, QC401_26/06/13	26-JUN-2013	---	10-JUL-2013	----	04-JUL-2013	10-JUL-2013	✓	
Soil Glass Jar - Unpreserved (EP068) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	11-AUG-2013	✓	
Soil Glass Jar - Unpreserved (EP068) TP7_0.3-0.4_27/06/13, TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, QC102_27/06/13, TP1_0.0-0.1_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.0-0.1_27/06/13, TP4_0.0-0.1_27/06/13, QC402_27/06/13	27-JUN-2013	---	11-JUL-2013	----	04-JUL-2013	11-JUL-2013	✓	



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								
Snap Lock Bag (EP071) TP15_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
Soil Glass Jar - Unpreserved (EP071) TP30_0.0-0.1_25/06/13, TP27_0.5-0.6_25/06/13, TP26_1.5-1.6_25/06/13,	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
TP29_0.3-0.4_25/06/13, TP28_0.0-0.1_25/06/13, QC400_25/06/13								
Soil Glass Jar - Unpreserved (EP071) TP25_0.0-0.1_26/06/13, TP24_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP14_0.0-0.1_26/06/13, TP9_0.3-0.4_26/06/13, TP11_0.1-0.2_26/06/13, TP8_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
QC100_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.5-0.6_26/06/13, TP13_0.5-0.6_26/06/13, TP10_0.0-0.1_26/06/13, TP12_0.0-0.1_26/06/13,								
Soil Glass Jar - Unpreserved (EP071) QC101_26/06/13,	26-JUN-2013	03-JUL-2013	10-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓	
QC401_26/06/13								
Soil Glass Jar - Unpreserved (EP071) TP7_0.3-0.4_27/06/13, TP5_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13, TP3_0.0-0.1_27/06/13, QC402_27/06/13	27-JUN-2013	03-JUL-2013	11-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓	
TP6_0.2-0.3_27/06/13, QC102_27/06/13, TP2_0.2-0.4_27/06/13, TP4_0.0-0.1_27/06/13,								



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)A: Phenolic Compounds								
Snap Lock Bag (EP075(SIM)) TP15_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
Soil Glass Jar - Unpreserved (EP075(SIM)) TP30_0.0-0.1_25/06/13, TP27_0.5-0.6_25/06/13, TP26_1.5-1.6_25/06/13,	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
TP29_0.3-0.4_25/06/13, TP28_0.0-0.1_25/06/13, QC400_25/06/13								
Soil Glass Jar - Unpreserved (EP075(SIM)) TP25_0.0-0.1_26/06/13, TP24_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP14_0.0-0.1_26/06/13, TP9_0.3-0.4_26/06/13, TP11_0.1-0.2_26/06/13, TP8_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓	
QC100_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.5-0.6_26/06/13, TP13_0.5-0.6_26/06/13, TP10_0.0-0.1_26/06/13, TP12_0.0-0.1_26/06/13,								
Soil Glass Jar - Unpreserved (EP075(SIM)) QC101_26/06/13,	26-JUN-2013	03-JUL-2013	10-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓	
QC401_26/06/13								
Soil Glass Jar - Unpreserved (EP075(SIM)) TP7_0.3-0.4_27/06/13, TP5_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13, TP3_0.0-0.1_27/06/13, QC402_27/06/13	27-JUN-2013	03-JUL-2013	11-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓	
TP6_0.2-0.3_27/06/13, QC102_27/06/13, TP2_0.2-0.4_27/06/13, TP4_0.0-0.1_27/06/13,								



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								
Snap Lock Bag (EP075(SIM)) TP15_0.0-0.1_26/06/13		26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.5-0.6_25/06/13, TP28_0.0-0.1_25/06/13, TP26_1.5-1.6_25/06/13, QC400_25/06/13		25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-.0.1_26/06/13, TP8_0.0-0.1_26/06/13		26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) QC101_26/06/13, QC401_26/06/13		26-JUN-2013	03-JUL-2013	10-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) TP7_0.3-0.4_27/06/13, TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, QC102_27/06/13, TP1_0.0-0.1_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.0-0.1_27/06/13, TP4_0.0-0.1_27/06/13, QC402_27/06/13		27-JUN-2013	03-JUL-2013	11-JUL-2013	✓	03-JUL-2013	12-AUG-2013	✓



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: BTEX									
Snap Lock Bag (EP080) TP15_0.0-0.1_26/06/13		26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓	
Soil Glass Jar - Unpreserved (EP080) TP30_0.0-0.1_25/06/13, TP27_0.5-0.6_25/06/13, TP26_1.5-1.6_25/06/13,		TP29_0.3-0.4_25/06/13, TP28_0.0-0.1_25/06/13, QC400_25/06/13	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	09-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP25_0.0-0.1_26/06/13, TP24_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP14_0.0-0.1_26/06/13, TP9_0.3-0.4_26/06/13, TP11_0.1-0.2_26/06/13, TP8_0.0-0.1_26/06/13		QC100_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.5-0.6_26/06/13, TP13_0.5-0.6_26/06/13, TP10_0.0-0.1_26/06/13, TP12_0.0-0.1_26/06/13,	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) QC101_26/06/13,		QC401_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP7_0.3-0.4_27/06/13, TP5_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13, TP3_0.0-0.1_27/06/13, QC402_27/06/13		TP6_0.2-0.3_27/06/13, QC102_27/06/13, TP2_0.2-0.4_27/06/13, TP4_0.0-0.1_27/06/13,	27-JUN-2013	02-JUL-2013	11-JUL-2013	✓	04-JUL-2013	11-JUL-2013	✓

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							
Snap Lock Bag (EP080) TP15_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP30_0.0-0.1_25/06/13, TP29_0.3-0.4_25/06/13, TP27_0.5-0.6_25/06/13, TP28_0.0-0.1_25/06/13, TP26_1.5-1.6_25/06/13, QC400_25/06/13	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	09-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP25_0.0-0.1_26/06/13, QC100_26/06/13, TP24_0.5-0.6_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP16A_0.5-0.6_26/06/13, TP14_0.0-0.1_26/06/13, TP13_0.5-0.6_26/06/13, TP9_0.3-0.4_26/06/13, TP10_0.0-0.1_26/06/13, TP11_0.1-0.2_26/06/13, TP12_0.0-0.1_26/06/13, TP8_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) QC101_26/06/13, QC401_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP7_0.3-0.4_27/06/13, TP6_0.2-0.3_27/06/13, TP5_0.5-0.6_27/06/13, QC102_27/06/13, TP1_0.0-0.1_27/06/13, TP2_0.2-0.4_27/06/13, TP3_0.0-0.1_27/06/13, TP4_0.0-0.1_27/06/13, QC402_27/06/13	27-JUN-2013	02-JUL-2013	11-JUL-2013	✓	04-JUL-2013	11-JUL-2013	✓



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							
Snap Lock Bag (EP080) TP15_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP30_0.0-0.1_25/06/13, TP27_0.5-0.6_25/06/13, TP26_1.5-1.6_25/06/13, TP29_0.3-0.4_25/06/13, TP28_0.0-0.1_25/06/13, QC400_25/06/13	25-JUN-2013	02-JUL-2013	09-JUL-2013	✓	03-JUL-2013	09-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP25_0.0-0.1_26/06/13, TP24_0.5-0.6_26/06/13, TP16A_0.2-0.3_26/06/13, TP14_0.0-0.1_26/06/13, TP9_0.3-0.4_26/06/13, TP11_0.1-0.2_26/06/13, TP8_0.0-0.1_26/06/13, QC100_26/06/13, TP20_0.5-0.6_26/06/13, TP16A_0.5-0.6_26/06/13, TP13_0.5-0.6_26/06/13, TP10_0.0-0.1_26/06/13, TP12_0.0-0.1_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) QC101_26/06/13, QC401_26/06/13	26-JUN-2013	02-JUL-2013	10-JUL-2013	✓	04-JUL-2013	10-JUL-2013	✓
Soil Glass Jar - Unpreserved (EP080) TP7_0.3-0.4_27/06/13, TP5_0.5-0.6_27/06/13, TP1_0.0-0.1_27/06/13, TP3_0.0-0.1_27/06/13, QC402_27/06/13, TP6_0.2-0.3_27/06/13, QC102_27/06/13, TP2_0.2-0.4_27/06/13, TP4_0.0-0.1_27/06/13	27-JUN-2013	02-JUL-2013	11-JUL-2013	✓	04-JUL-2013	11-JUL-2013	✓

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_25/06/13	25-JUN-2013	03-JUL-2013	22-DEC-2013	✓	03-JUL-2013	22-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC301_26/06/13	26-JUN-2013	03-JUL-2013	23-DEC-2013	✓	03-JUL-2013	23-DEC-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC302_27/06/13	27-JUN-2013	03-JUL-2013	24-DEC-2013	✓	03-JUL-2013	24-DEC-2013	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC300_25/06/13	25-JUN-2013	----	----	----	09-JUL-2013	23-JUL-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC301_26/06/13	26-JUN-2013	----	----	----	09-JUL-2013	24-JUL-2013	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) QC302_27/06/13	27-JUN-2013	----	----	----	09-JUL-2013	25-JUL-2013	✓



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
EP068A: Organochlorine Pesticides (OC)							
Amber Glass Bottle - Unpreserved (EP068) QC300_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP068) QC301_26/06/13	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP068) QC302_27/06/13	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
EP068B: Organophosphorus Pesticides (OP)							
Amber Glass Bottle - Unpreserved (EP068) QC300_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP068) QC301_26/06/13	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP068) QC302_27/06/13	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC300_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP071) QC301_26/06/13	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP071) QC302_27/06/13	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC300_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC301_26/06/13	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC302_27/06/13	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC300_25/06/13	25-JUN-2013	02-JUL-2013	02-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC301_26/06/13	26-JUN-2013	02-JUL-2013	03-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC302_27/06/13	27-JUN-2013	02-JUL-2013	04-JUL-2013	✓	03-JUL-2013	11-AUG-2013	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC300_25/06/13	25-JUN-2013	03-JUL-2013	09-JUL-2013	✓	03-JUL-2013	09-JUL-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC301_26/06/13	26-JUN-2013	03-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC302_27/06/13	27-JUN-2013	03-JUL-2013	11-JUL-2013	✓	03-JUL-2013	11-JUL-2013	✓



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
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080) QC300_25/06/13	25-JUN-2013	03-JUL-2013	09-JUL-2013	✓	03-JUL-2013	09-JUL-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC301_26/06/13	26-JUN-2013	03-JUL-2013	10-JUL-2013	✓	03-JUL-2013	10-JUL-2013	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC302_27/06/13	27-JUN-2013	03-JUL-2013	11-JUL-2013	✓	03-JUL-2013	11-JUL-2013	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	4	32	12.5	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	2	15	13.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	6	64	9.4	10.0	✗	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	33.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	2	15	13.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	4	35	11.4	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	4	31	12.9	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
pH (1:5)	EA002	3	23	13.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	2	10	20.0	9.5	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	6	60	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	6	60	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus By Discrete Analyser	EK067G	1	3	33.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	4	34	11.8	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	4	40	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	2	32	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	3	33.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Organic Matter	EP004	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	35	5.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	31	6.5	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	3	10	30.0	14.3	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	3	60	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	3	60	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus By Discrete Analyser	EK067G	3	3	100.0	15.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	34	5.9	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	40	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	2	32	6.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Exchangeable Cations with pre-treatment	ED008	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	4	25.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

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

Matrix: **WATER** Evaluation: **x** = Quality Control frequency not within specification ; **✓** = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	1	3	33.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	13.3	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	3	33.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	3	33.3	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	25.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							



Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	25.0	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	3	33.3	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	3	33.3	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	4	25.0	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	3	33.3	5.0	✔	ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	6.7	5.0	✔	ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	ALS QCS3 requirement



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
pH (1:5)	EA002	SOIL	(APHA 21st ed., 4500H+) pH is determined on soil samples after a 1:5 soil/water leach. This method is compliant with NEPM (1999) Schedule B(3) (Method 103)
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2010 Draft) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Particle Size Analysis by Hydrometer	EA150H	SOIL	Particle Size Analysis by Hydrometer according to AS1289.3.6.3 - 2003
Asbestos Identification in bulk solids	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples
Asbestos - Quantitative Analysis	* EA200Q	SOIL	Estimation of Asbestos content with Confirmation of Identification by AS 4964 - 2004 Asbestos
Exchangeable Cations with pre-treatment	ED008	SOIL	Rayment & Higginson (1992) Method 15A2. Soluble salts are removed from the sample prior to analysis. 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 (1999) Schedule B(3) (Method 301)
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (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 (1999) Schedule B(3)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH ₃ +B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Nitrite as N - Soluble by Discrete Analyser	EK057G	SOIL	APHA 21st ed., 4500 NO ₃ - B. Nitrite in a water extract is determined by direct colourimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	EK058G	SOIL	APHA 21st ed., 4500 NO ₃ --F. Nitrate in the 1:5 soil:water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NO _x)- Soluble by Discrete Analyser	EK059G	SOIL	APHA 21st ed., 4500 NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) in a water extract is determined by Chemical Reduction, and direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	APHA 21st ed., 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NO _x) By Discrete Analyser	EK062G	SOIL	APHA 21st ed., 4500 Norg/NO ₃ - Total Nitrogen is determined as the sum of TKN and Oxidised Nitrogen, each determined separately as N.
Total Phosphorus By Discrete Analyser	EK067G	SOIL	APHA 21st ed., 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Organic Matter	EP004	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (1999) Schedule B(3) (Method 105)



Analytical Methods	Method	Matrix	Method Descriptions
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (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 (1999) Schedule B(3) (Appdx. 2)
Pesticides by GCMS	EP068	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Preparation Methods	Method	Matrix	Method Descriptions
Exchangeable Cations Preparation Method	ED007PR	SOIL	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.
1:5 solid / water leach for soluble analytes	EN34	SOIL	10 g of soil is mixed with 50 mL of distilled 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.



Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)
Organic Matter	EP004-PR	SOIL	AS1289.4.1.1 - 1997., Dichromate oxidation method after Walkley and Black. This method is compliant with NEPM (1999) Schedule B(3) (Method 105)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Arsenic	7440-38-2	30.0 %	0-20%	RPD exceeds LOR based limits
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Zinc	7440-66-6	30.7 %	0-20%	RPD exceeds LOR based limits
EK067G: Total Phosphorus as P by Discrete Analyser	EW1301886-017	TP26_0.5-0.6_25/06/13	Total Phosphorus as P	----	27.7 %	0-20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Arsenic	7440-38-2	29.3 %	70-130%	Recovery less than lower data quality objective
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Copper	7440-50-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG005T: Total Metals by ICP-AES	EW1301886-042	TP15_0.0-0.1_26/06/13	Copper	7440-50-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Lead	7439-92-1	210 %	70-130%	Recovery greater than upper data quality objective
EG005T: Total Metals by ICP-AES	EW1301886-001	TP30_0.0-0.1_25/06/13	Zinc	7440-66-6	429 %	70-130%	Recovery greater than upper data quality objective

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP080/071: Total Petroleum Hydrocarbons	ES1314718-019	Anonymous	C6 - C9 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	ES1314718-019	Anonymous	C6 - C10 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080: BTEXN	ES1314718-019	Anonymous	meta- & para-Xylene	108-38-3 106-42-3	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080: BTEXN	ES1314718-019	Anonymous	ortho-Xylene	95-47-6	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

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



Regular Sample Surrogates

Sub-Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP080S: TPH(V)/BTEX Surrogates	EW1301886-092	TP3_0.0-0.1_27/06/13	4-Bromofluorobenzene	460-00-4	70.6 %	71.6-130.0 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

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

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

Matrix: SOIL

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Moisture Content	6	64	9.4	10.0	NEPM 1999 Schedule B(3) and ALS QCS3 requirement

9/7/13 Add Ke Ye to receive reports.

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

137623028

PKC - Primary School

Ke Ye

24hrs ☐ 48hrs ☐ Standard ☒

HARD ☐ FAX ☐ DISK ☐ Date Requested By:

PDF ☐ EXCEL ☐ EMAIL ☐ BULLETIN BOARD ☐ EQUIS ☐

SV - 493 - 13

ALS

GOLDER ASSOCIATES PTY LTD 4225 3/25

121 Pacific Highway, Greenfield

Project Manager:

Job Contact:

Caroline Olimpos

Ke Ye

Phone: (02) 9476 3900

Fax: (02) 9476 3901

Mobile: 0409 212 705

99 deny sheet

Environmental Division
NSW South Coast
Work Order
EW1301886

Telephone: 02 42253125

1 Please put all the samples on hold

2 Please send invoice to Port Kembla City Council

LAB	ID	SAMPLE	DATE	SAMPLE	TIME	SAMPLE	DATE	TIME	ANALYSIS REQUIRED
1	TP30-0.0-0.1-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
2	TP30-0.5-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
3	TP30-0.4-1.0-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
4	TP29-0.0-0.1-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
5	TP29-0.3-0.4-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
6	TP29-0.5-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
7	TP29-0.4-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
8	TP27-0.0-0.1-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
9	TP27-0.5-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
10	TP27-1.5-1.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
11	TP28-0.0-0.1-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
12	TP28-0.5-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
13	TP28-0.4-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
14	TP28-0.9-1.0-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
15	TP26-0.0-0.1-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
16	TP26-0.5-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
17	TP26-0.4-0.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
18	TP26-0.9-1.0-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)
19	TP27-1.5-1.6-25/06/13	25/6/13	pm	5	1	1	1	1	Asbestos (individual fibres)

SAMPLE MATRIX - Solid/Solution/Tissue/Water/Air

SIGNATURE: *Ke Ye*

COMPANY: Golder

DATE: 27/6

TIME: 13:00

RECEIVED BY: *Ke Ye*

DATE: 27/6

TIME: 14:00

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 2 of 2

137623028		PKC - Primary School		SY - 493 - 13		AIS	
Ke Ye		48hrs ☐ Standard ☐		Date Required By:		GOLDER ASSOCIATES PTY LTD	
24hrs ☐ 5 Days ☐		HARD ☐ FAX ☐ DISK ☐		EMAIL ☐		Project Manager: Carolina Olmos	
PDF ☐ EXCEL ☐		ESD ☐ BULLETIN BOARD ☐		EQUIS ☐		Ke Ye	
Comments/Special Instructions: Please email report to colmos@golder.com.au and gmliller@golder.com.au				124 Pacific Highway, Greenfield Project Manager: 100 Contact:			
				Phone: (02) 9478 3000 Fax: (02) 9478 3901 Email: info@golder.com.au			

LAB	SAMPLE	DATE	SAMPLE	SAMPLE	NO CONTAINERS	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Fe, Pb, Zn, Mn, Se, Hg)	BTEX (TPH, PAH, Phenols)	OPP/OCPP	Ammonia As N	Total N (TKN), NO ₃ , NO ₂ , NH ₄ , Total Phosphorus	Asbestos (including Asbestos, Chrysotile, Amphibole, Sphalerite, Pyrite, Iron)	TPH C6-C9 - BTEX (Trip Blank)
20	TP26-2.0-2.1-25/04/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
21	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
22	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
23	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
24	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
25	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
26	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
27	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
28	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
29	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
30	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
31	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
32	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
33	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
34	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
35	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
36	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
37	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
38	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
39	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*
40	TP26-2.5-2.6-25/06/13	25/6	25/6	25/6	1	1	*	*	*	*	*	*	*

SIGNATURE		COMPANY		DATE		TIME	
Ke Ye		Golder		27/6		1:00	
RELEASED BY		COMPANY		DATE		TIME	
Ke Ye		Golder		27/6		14:00	
RECEIVED BY		COMPANY		DATE		TIME	
Ke Ye		Golder		27/6		14:00	

2.1.1

GOLDER ASSOCIATES PVT LTD
 120 Pacific Highway, Greenwich
 Project Manager
 Job Contact:

Caroline Olmos
 Ke Ye

Tel: (02) 9478 3900
 Fax: (02) 9478 3981
 E-mail: keye@golder.com.au

ANALYSIS REQUIRED

0409 212 705

 **Golder Associates**

Please email report to colmos@golder.com.au and gumiller@golder.com.au

LAB	SAMPLE	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/Mid/high/Unknown)	Methals (As, Co, Cr, Cu, Mn, Se, Pb)	BTX (B, T, X)	PH (P, H)	OC (O, C)	Ammonia As	Total N +TKN+NO2+NO3+NH4 Phosphorus	Asbestos	% Clay	SH TOC	HOLD	Asbestos - NE	TPH C6-C9 - BT (Trip Blank)
39	TP16A-0.5-0.6-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
40	TP16A-0.9-1.0-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
41	TP16B-0.1-0.2-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
42	TP15-0.0-0.1-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
43	TP15-0.5-0.6-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
44	TP15-0.9-1.0-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
45	TP15-0.0-0.1-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
46	TP15-0.5-0.6-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
47	TP15-0.9-1.0-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
48	TP15-0.0-0.1-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
49	TP15-0.5-0.6-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
50	TP13-0.0-0.1-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
51	TP13-0.5-0.6-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
52	TP13-0.9-1.0-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
53	TP9-0.0-0.1-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
54	TP9-0.3-0.4-2.6/0.6/13	26/11	02	S	1 bag		*	*	*	*								
55	TP9-0.5-0.6-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
56	TP10-0.0-0.1-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
57	TP10-0.5-0.6-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								
58	TP10-0.9-1.0-2.6/0.6/13	26/11	02	S	2+1 bag		*	*	*	*								

DATE	TIME	Method of Shipment

calculus 20, 41, 63,
412, 189, 61, 79 021 Fm-

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

137623028

PKC - Primary School

Ke Ye

24hrs ☐ 48hrs ☐ Standard ☐

3days ☐ 5 Days ☐ Date Requested By:

Hard ☐ FAX ☐ Disk ☐ EMAIL ☐ BULLETIN BOARD ☐

PDF ☐ EXCEL ☐ ESDAT ☐ EQUIS ☐

ALS

ST - 493 - 13

GOLDER ASSOCIATES PTY LTD

134 Pacific Highway, Greenfield

Project Manager:

Job Contact:

Carolina Olmos

Ke Ye

Phone: (02) 9478 3900

Fax: (02) 9478 3901

Reference: 0409 212 705

Email: ky@golder.com.au



Connect to Special Instructions:

Please email report to colman@golder.com.au and graham@golder.com.au

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/high/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Ba)	BTX/TPH/PAHs/Phenols	OCFA (+0/1/2)	Ammonia As N	Total N +TKN+NO2+NO3+NH3+Total Phosphorus	Asbestos (Cindividing Pieces)	9% Clay (Pencil mark) (N100/CEC and Iron)	HF/HD	Asbestos (Newly-PP)	TPH C6-C9 - BTEX (Trip Blank)
52	TP11-0.1-0.2-26/06/13	26/6	pm	S	1+1 bucket		X	X	X	X						
60	TP11-0.5-0.6-26/06/13			S	1+1 bucket		X	X	X	X						
61	TP11-0.9-1.0-26/06/13			S	2+1 bag		X	X	X	X						
62	TP11-1.4-1.5-26/06/13			S			X	X	X	X						
63	TP12A-0.1-0.2-26/06/13	26/6	pm	S	1 bag (asbestos)		X	X	X	X						
64	TP12-0.0-0.1-26/06/13			S	1+1 bucket		X	X	X	X						
65	TP12-0.5-0.6-26/06/13			S			X	X	X	X						
66	TP12-0.9-1.0-26/06/13			S			X	X	X	X						
67	TP8-0.0-0.1-26/06/13			S	2 bag + 1 bag		X	X	X	X						
68	TP8-0.5-0.6-26/06/13			S			X	X	X	X						
69	TP8-0.9-1.0-26/06/13			S			X	X	X	X						
70	OC1-1-26/06/13			S			X	X	X	X						
71	OC2-2-26/06/13			S			X	X	X	X						
72	OC3-3-26/06/13	26/6	pm	S			X	X	X	X						

SAMPLE MATRIX - See below for details

SAMPLE TYPE - Composite (C), Direct (D), Grab (G), Grab Sample (GS)

HIGH CONCENTRATION: check appropriate parameter in analysis kit

BASED BY: Msgr Aneta COMPANY: Golder ALS DATE: 27/6 TIME: 1pm

TO BY: ALS DATE: 27/6 TIME: 14:00

School of...

137623028

PKC - Primary School

Ke Ye

ALS

SY - 493 - 13

24hrs ☐ **48hrs** ☐ **Standard** ☒

36hrs ☐ **5 Days** ☐ **Date Requested By:**

Hard ☐ **FAX** ☐ **DISK** ☐ **EMAIL** ☒ **BULLETIN BOARD** ☐

PDF ☒ **EXCEL** ☐ **ESD/AT** ☐ **EQUIS** ☒

Comments/Special Instructions:

Please email report to colinas@golder.com.au and gmliller@golder.com.au

LAB	ID	SAMPLE	DATE	SAMPLE TIME	SAMPLE	MATERIAL	No CONTAINERS	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Fe, Ni, Pb, Zn, Mn, Sr, Ti)	BTX (TPH, PAHs, Phenols)	OCFs + OPPs	Ammonia As N	Total N +TKN+NO2+NO3+NH3+Total Phosphorus	Asbestos (individual pieces)	Asbestos (bulk)	Asbestos (new)	TPH C6-C9 - BTX (Trip Blank)
73	TP7-0.0-0.1-27/06/13	27/6	27/6	8:00	1+1 bucket	1	1	1	X	X	X	X	X	X	X	X	X
74	TP7-0.3-0.4-27/06/13	27/6	27/6	8:00	2+1 bucket	1	1	1	X	X	X	X	X	X	X	X	X
75	TP7-0.5-0.6-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
76	TP7-0.9-1.0-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
77	TP6-0.0-0.1-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
78	TP6-0.2-0.3-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
79	TP6-0.5-0.6-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
80	TP6-0.9-1.0-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
81	TP5-0.0-0.1-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
82	TP5-0.5-0.6-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
83	TP5-0.9-1.0-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
84	TP5-0.0-0.1-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
85	TP5-1.1-1.2-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
86	TP4-0.0-0.1-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
87	TP4-0.5-0.6-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
88	TP4-0.9-1.0-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
89	TP2-0.0-0.1-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X
90	TP2-0.5-0.6-27/06/13	27/6	27/6	8:00	1	1	1	1	X	X	X	X	X	X	X	X	X

ANALYSIS REQUIRED

TPH C6-C9 - BTX (Trip Blank)

Signature: _____ **Date:** _____ **Time:** _____

Company: _____ **Method of Shipment:** _____

THIS FORM IS TO BE SIGNED BY GOLDER STAFF, COURIERS, LABORATORY ON RECEIPT OF SAMPLES

Street of the

GOLDER ASSOCIATES PTY LTD
124 Pacific Highway, Greenwich
Project Manager:
Job Contact:

Phone: : (02) 9478 3900
Fax : (02) 9478 3901
Sydney, NSW
Email: hw@golder.com.au

Carolina Olmos
Ke Ye

ANALYST REQUIRED

 **Golder Associates**

Please email report to colmo@goolder.com.au and grueller@goolder.com.au

[illegible]

SAMPLE MATRIX - Substances/Fluoride/Iodide		SAMPLE TYPE - Compositd(CD)Distillate(DS)Acid(CA) Grab Sample (GS)		HIGH CONCENTRATION: enter expected parameters in analysis list			
SIGNATURE	COMPANY	DATE	TIME	SIGNATURE	COMPANY	DATE	TIME
RELEASED BY	page	6/2/84	1				
RECEIVED BY	Arts	2/7/86	14:00				
RELEASED BY							
RECEIVED BY							

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EW1301886**

Client : **PORT KEMBLA COPPER**

Laboratory : Environmental Division NSW South Coast

Contact : MS CAROLINA OLMOS

Contact : Client Services
Address : 99 Kenny Street, Wollongong 2500
Unit 4 / 13 Geary Place, PO Box 3105,
North Nowra 2541
AUSTRALIA

Address : SYDNEY

Address

E-mail : colmos@golder.com.au

E-mail : sydney@alsglobal.com

Telephone : ----

Telephone : +61-2-8784 8555

Facsimile : ----

Facsimile : +61-2-8784 8500

Project : 137623028

Page : 1 of 9

Order number : ----

Quote number : ----

C-O-C number : ----

Site : PKC-PRIMARY SCHOOL

QC Level : NEPM 1999 Schedule B(3) and ALS
QCS3 requirement

Sampler : KE YE

Dates

Date Samples Received : 27-JUN-2013

Issue Date : 02-JUL-2013 11:47

Client Requested Due Date : 09-JUL-2013

Scheduled Reporting Date : **09-JUL-2013**

Delivery Details

Mode of Delivery : Client Drop off

Temperature : 0.6' C'C - Ice present

No. of coolers/boxes : 6 HARD

No. of samples received : 103

Security Seal : Intact.

No. of samples analysed : 64

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.
- Particle size and ASBESTOS analysis will be subcontracted to ALS Newcastle.
- Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the Sample Container(s)/Preservation Non-Compliance Log at the end of this report for details.**
- Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Analytical work for this work order will be conducted at ALS Sydney.**
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.**
- Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Samples QC200, QC201 and QC202 will be forwarded to Envirolab as per COC.**



Sample Container(s)/Preservation Non-Compliances

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

Method Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
EP068 : Pesticides by GCMS		
TP15_0.0-0.1_26/06/13	- Snap Lock Bag	- Soil Glass Jar - Unpreserved
EP071 : TPH - Semivolatile Fraction		
TP15_0.0-0.1_26/06/13	- Snap Lock Bag	- Soil Glass Jar - Unpreserved
EP075(SIM) : PAH/Phenols (SIM)		
TP15_0.0-0.1_26/06/13	- Snap Lock Bag	- Soil Glass Jar - Unpreserved
EP080 : TPH Volatiles/BTEX		
TP15_0.0-0.1_26/06/13	- Snap Lock Bag	- Soil Glass Jar - Unpreserved

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EW1301886-001	: 25-JUN-2013 10:00	: TP30_0.0-0.1_25/06/13
EW1301886-002	: 25-JUN-2013 10:00	: TP30_0.5-0.6_25/06/13
EW1301886-003	: 25-JUN-2013 10:00	: TP30_0.9-1.0_25/06/13
EW1301886-004	: 25-JUN-2013 10:00	: TP29_0.0-0.1_25/06/13
EW1301886-005	: 25-JUN-2013 10:00	: TP29_0.3-0.4_25/06/13
EW1301886-006	: 25-JUN-2013 10:00	: TP29_0.5-0.6_25/06/13
EW1301886-007	: 25-JUN-2013 10:00	: TP29_0.9-1.0_25/06/13
EW1301886-008	: 25-JUN-2013 15:00	: TP27_0.0-0.1_25/06/13
EW1301886-009	: 25-JUN-2013 15:00	: TP27_0.5-0.6_25/06/13
EW1301886-010	: 25-JUN-2013 15:00	: TP27_0.9-1.0_25/06/13
EW1301886-011	: 25-JUN-2013 15:00	: TP27_1.5-1.6_25/06/13
EW1301886-012	: 25-JUN-2013 15:00	: TP28_0.0-0.1_25/06/13
EW1301886-013	: 25-JUN-2013 15:00	: TP28_0.5-0.6_25/06/13
EW1301886-014	: 25-JUN-2013 15:00	: TP28_0.9-1.0_25/06/13
EW1301886-015	: 25-JUN-2013 15:00	: TP28_1.5-1.6_25/06/13
EW1301886-016	: 25-JUN-2013 15:00	: TP26_0.0-0.1_25/06/13
EW1301886-017	: 25-JUN-2013 15:00	: TP26_0.5-0.6_25/06/13
EW1301886-018	: 25-JUN-2013 15:00	: TP26_0.9-1.0_25/06/13
EW1301886-019	: 25-JUN-2013 15:00	: TP26_1.5-1.6_25/06/13
EW1301886-020	: 25-JUN-2013 15:00	: TP26_2.0-2.1_25/06/13
EW1301886-021	: 25-JUN-2013 15:00	: TP26_2.5-2.6_25/06/13
EW1301886-024	: 26-JUN-2013 10:00	: TP25_0.0-0.1_26/06/13
EW1301886-025	: 26-JUN-2013 10:00	: TP25_0.5-0.6_26/06/13
EW1301886-026	: 26-JUN-2013 10:00	: TP25_0.9-1.0_26/06/13
EW1301886-027	: 26-JUN-2013 10:00	: TP25_1.5-1.6_26/06/13
EW1301886-028	: 26-JUN-2013 10:00	: TP25_1.9-2.0_26/06/13
EW1301886-030	: 26-JUN-2013 10:00	: TP24_0.0-0.1_26/06/13
EW1301886-031	: 26-JUN-2013 10:00	: TP24_0.5-0.6_26/06/13
EW1301886-032	: 26-JUN-2013 10:00	: TP24_0.9-1.0_26/06/13
EW1301886-033	: 26-JUN-2013 10:00	: TP20_0.0-0.1_26/06/13
EW1301886-034	: 26-JUN-2013 10:00	: TP20_0.5-0.6_26/06/13
EW1301886-035	: 26-JUN-2013 10:00	: TP20_0.9-1.0_26/06/13
EW1301886-036	: 26-JUN-2013 10:00	: TP20_1.5-1.6_26/06/13
EW1301886-037	: 26-JUN-2013 10:00	: TP16A_0.0-0.1_26/06/13
EW1301886-038	: 26-JUN-2013 10:00	: TP16A_0.2-0.3_26/06/13
EW1301886-039	: 26-JUN-2013 10:00	: TP16A_0.5-0.6_26/06/13
EW1301886-040	: 26-JUN-2013 10:00	: TP16A_0.9-1.0_26/06/13
EW1301886-041	: 26-JUN-2013 10:00	: TP16B_0.1-0.2_26/06/13
EW1301886-042	: 26-JUN-2013 10:00	: TP15_0.0-0.1_26/06/13
EW1301886-043	: 26-JUN-2013 10:00	: TP15_0.5-0.6_26/06/13
EW1301886-044	: 26-JUN-2013 10:00	: TP15_0.9-1.0_26/06/13
EW1301886-045	: 26-JUN-2013 10:00	: TP14_0.0-0.1_26/06/13
EW1301886-046	: 26-JUN-2013 10:00	: TP14_0.5-0.6_26/06/13
EW1301886-047	: 26-JUN-2013 10:00	: TP14_0.9-1.0_26/06/13
EW1301886-048	: 26-JUN-2013 10:00	: TP14_1.4-1.5_26/06/13
EW1301886-049	: 26-JUN-2013 10:00	: TP13_0.0-0.1_26/06/13
EW1301886-050	: 26-JUN-2013 10:00	: TP13_0.5-0.6_26/06/13
EW1301886-051	: 26-JUN-2013 10:00	: TP13_0.9-1.0_26/06/13



EW1301886-052	: 26-JUN-2013 10:00	: TP13_1.5-1.6_26/06/13
EW1301886-053	: 26-JUN-2013 15:00	: TP9_0.0-0.1_26/06/13
EW1301886-054	: 26-JUN-2013 15:00	: TP9_0.3-0.4_26/06/13
EW1301886-055	: 26-JUN-2013 15:00	: TP9_0.5-0.6_26/06/13
EW1301886-056	: 26-JUN-2013 15:00	: TP10_0.0-0.1_26/06/13
EW1301886-057	: 26-JUN-2013 15:00	: TP10_0.5-0.6_26/06/13
EW1301886-058	: 26-JUN-2013 15:00	: TP10_0.9-1.0_26/06/13
EW1301886-059	: 26-JUN-2013 15:00	: TP11_0.1-0.2_26/06/13
EW1301886-060	: 26-JUN-2013 15:00	: TP11_0.5-0.6_26/06/13
EW1301886-061	: 26-JUN-2013 15:00	: TP11_0.9-1.0_26/06/13
EW1301886-062	: 26-JUN-2013 15:00	: TP11_1.4-1.5_26/06/13
EW1301886-063	: 26-JUN-2013 15:00	: TP12A_0.1-0.2_26/06/13
EW1301886-064	: 26-JUN-2013 15:00	: TP12_0.0-0.1_26/06/13
EW1301886-065	: 26-JUN-2013 15:00	: TP12_0.5-0.6_26/06/13
EW1301886-066	: 26-JUN-2013 15:00	: TP12_0.9-1.0_26/06/13
EW1301886-067	: 26-JUN-2013 15:00	: TP8_0.0-0.1_26/06/13
EW1301886-068	: 26-JUN-2013 15:00	: TP8_0.5-0.6_26/06/13
EW1301886-069	: 26-JUN-2013 15:00	: TP8_0.9-1.0_26/06/13
EW1301886-073	: 27-JUN-2013 10:00	: TP7_0.0-0.1_27/06/13
EW1301886-074	: 27-JUN-2013 10:00	: TP7_0.3-0.4_27/06/13
EW1301886-075	: 27-JUN-2013 10:00	: TP7_0.5-0.6_27/06/13
EW1301886-076	: 27-JUN-2013 10:00	: TP7_0.9-1.0_27/06/13
EW1301886-077	: 27-JUN-2013 10:00	: TP6_0.0-0.1_27/06/13
EW1301886-078	: 27-JUN-2013 10:00	: TP6_0.2-0.3_27/06/13
EW1301886-079	: 27-JUN-2013 10:00	: TP6_0.5-0.6_27/06/13
EW1301886-080	: 27-JUN-2013 10:00	: TP6_0.9-1.0_27/06/13
EW1301886-081	: 27-JUN-2013 10:00	: TP5_0.0-0.1_27/06/13
EW1301886-082	: 27-JUN-2013 10:00	: TP5_0.5-0.6_27/06/13
EW1301886-084	: 27-JUN-2013 10:00	: TP5_0.9-1.0_27/06/13
EW1301886-085	: 27-JUN-2013 10:00	: TP5_1.1-1.2_27/06/13
EW1301886-086	: 27-JUN-2013 10:00	: TP1_0.0-0.1_27/06/13
EW1301886-087	: 27-JUN-2013 10:00	: TP1_0.5-0.6_27/06/13
EW1301886-088	: 27-JUN-2013 10:00	: TP1_0.9-1.0_27/06/13
EW1301886-089	: 27-JUN-2013 10:00	: TP2_0.0-0.1_27/06/13
EW1301886-090	: 27-JUN-2013 10:00	: TP2_0.2-0.4_27/06/13
EW1301886-091	: 27-JUN-2013 10:00	: TP2_0.9-1.0_27/06/13
EW1301886-092	: 27-JUN-2013 10:00	: TP3_0.0-0.1_27/06/13
EW1301886-093	: 27-JUN-2013 10:00	: TP3_0.5-0.6_27/06/13
EW1301886-094	: 27-JUN-2013 10:00	: TP3_0.9-1.0_27/06/13
EW1301886-095	: 27-JUN-2013 10:00	: TP4_0.0-0.1_27/06/13
EW1301886-096	: 27-JUN-2013 10:00	: TP4_0.5-0.6_27/06/13
EW1301886-097	: 27-JUN-2013 10:00	: TP4_0.9-1.0_27/06/13
EW1301886-100	: 27-JUN-2013 15:00	: OL1_0.0-0.2_27/06/13
EW1301886-101	: 27-JUN-2013 15:00	: OL1_0.3-0.5_27/06/13
EW1301886-102	: 27-JUN-2013 15:00	: OL2_0.0-0.2_27/06/13
EW1301886-103	: 27-JUN-2013 15:00	: OL2_0.3-0.5_27/06/13

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

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



Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EA150H Particle Size Analysis by Hydrometer	SOIL - EA200 Asbestos Identification in Soils	SOIL - EA200N Asbestos - Estimated Percentage by	SOIL - ED008 Def Exchangeable Cations with pre-treatment	SOIL - EG005T (solids) Total Metals by ICP-AES
EW1301886-001	25-JUN-2013 10:00	TP30_0.0-0.1_25/06/13								✓
EW1301886-002	25-JUN-2013 10:00	TP30_0.5-0.6_25/06/13			✓					✓
EW1301886-003	25-JUN-2013 10:00	TP30_0.9-1.0_25/06/13	✓							
EW1301886-004	25-JUN-2013 10:00	TP29_0.0-0.1_25/06/13	✓							
EW1301886-005	25-JUN-2013 10:00	TP29_0.3-0.4_25/06/13		✓		✓			✓	✓
EW1301886-006	25-JUN-2013 10:00	TP29_0.5-0.6_25/06/13	✓							
EW1301886-007	25-JUN-2013 10:00	TP29_0.9-1.0_25/06/13			✓					✓
EW1301886-008	25-JUN-2013 15:00	TP27_0.0-0.1_25/06/13			✓					✓
EW1301886-009	25-JUN-2013 15:00	TP27_0.5-0.6_25/06/13								✓
EW1301886-010	25-JUN-2013 15:00	TP27_0.9-1.0_25/06/13	✓							
EW1301886-011	25-JUN-2013 15:00	TP27_1.5-1.6_25/06/13	✓							
EW1301886-012	25-JUN-2013 15:00	TP28_0.0-0.1_25/06/13								✓
EW1301886-013	25-JUN-2013 15:00	TP28_0.5-0.6_25/06/13	✓							
EW1301886-014	25-JUN-2013 15:00	TP28_0.9-1.0_25/06/13		✓	✓	✓			✓	✓
EW1301886-015	25-JUN-2013 15:00	TP28_1.5-1.6_25/06/13	✓							
EW1301886-016	25-JUN-2013 15:00	TP26_0.0-0.1_25/06/13	✓							
EW1301886-017	25-JUN-2013 15:00	TP26_0.5-0.6_25/06/13			✓					✓
EW1301886-018	25-JUN-2013 15:00	TP26_0.9-1.0_25/06/13	✓							
EW1301886-019	25-JUN-2013 15:00	TP26_1.5-1.6_25/06/13								✓
EW1301886-020	25-JUN-2013 15:00	TP26_2.0-2.1_25/06/13	✓							
EW1301886-021	25-JUN-2013 15:00	TP26_2.5-2.6_25/06/13	✓							
EW1301886-023	25-JUN-2013 15:00	QC400_25/06/13								✓
EW1301886-024	26-JUN-2013 10:00	TP25_0.0-0.1_26/06/13		✓		✓			✓	✓
EW1301886-025	26-JUN-2013 10:00	TP25_0.5-0.6_26/06/13	✓							
EW1301886-026	26-JUN-2013 10:00	TP25_0.9-1.0_26/06/13			✓					✓
EW1301886-027	26-JUN-2013 10:00	TP25_1.5-1.6_26/06/13	✓							
EW1301886-028	26-JUN-2013 10:00	TP25_1.9-2.0_26/06/13	✓							
EW1301886-029	26-JUN-2013 10:00	QC100_26/06/13								✓
EW1301886-030	26-JUN-2013 10:00	TP24_0.0-0.1_26/06/13			✓					✓
EW1301886-031	26-JUN-2013 10:00	TP24_0.5-0.6_26/06/13		✓		✓			✓	✓
EW1301886-032	26-JUN-2013 10:00	TP24_0.9-1.0_26/06/13	✓							
EW1301886-033	26-JUN-2013 10:00	TP20_0.0-0.1_26/06/13	✓							
EW1301886-034	26-JUN-2013 10:00	TP20_0.5-0.6_26/06/13		✓		✓		✓	✓	✓
EW1301886-035	26-JUN-2013 10:00	TP20_0.9-1.0_26/06/13			✓					✓
EW1301886-036	26-JUN-2013 10:00	TP20_1.5-1.6_26/06/13	✓							
EW1301886-037	26-JUN-2013 10:00	TP16A_0.0-0.1_26/06/...	✓							
EW1301886-038	26-JUN-2013 10:00	TP16A_0.2-0.3_26/06/...								✓
EW1301886-039	26-JUN-2013 10:00	TP16A_0.5-0.6_26/06/...								✓
EW1301886-040	26-JUN-2013 10:00	TP16A_0.9-1.0_26/06/...					✓			
EW1301886-041	26-JUN-2013 10:00	TP16B_0.1-0.2_26/06/...					✓			
EW1301886-042	26-JUN-2013 10:00	TP15_0.0-0.1_26/06/13						✓		✓



			(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EA150H Particle Size Analysis by Hydrometer	SOIL - EA200 Asbestos Identification in Soils	SOIL - EA200N Asbestos - Estimated Percentage by	SOIL - ED008 Def Exchangeable Cations with pre-treatment	SOIL - EG005T (solids) Total Metals by ICP-AES
EW1301886-043	26-JUN-2013 10:00	TP15_0.5-0.6_26/06/13	✓							
EW1301886-044	26-JUN-2013 10:00	TP15_0.9-1.0_26/06/13		✓	✓	✓			✓	✓
EW1301886-045	26-JUN-2013 10:00	TP14_0.0-0.1_26/06/13		✓		✓			✓	✓
EW1301886-046	26-JUN-2013 10:00	TP14_0.5-0.6_26/06/13			✓					✓
EW1301886-047	26-JUN-2013 10:00	TP14_0.9-1.0_26/06/13	✓							
EW1301886-048	26-JUN-2013 10:00	TP14_1.4-1.5_26/06/13	✓							
EW1301886-049	26-JUN-2013 10:00	TP13_0.0-0.1_26/06/13	✓							
EW1301886-050	26-JUN-2013 10:00	TP13_0.5-0.6_26/06/13								✓
EW1301886-051	26-JUN-2013 10:00	TP13_0.9-1.0_26/06/13	✓							
EW1301886-052	26-JUN-2013 10:00	TP13_1.5-1.6_26/06/13			✓					✓
EW1301886-053	26-JUN-2013 15:00	TP9_0.0-0.1_26/06/13	✓							
EW1301886-054	26-JUN-2013 15:00	TP9_0.3-0.4_26/06/13								✓
EW1301886-055	26-JUN-2013 15:00	TP9_0.5-0.6_26/06/13		✓	✓	✓			✓	✓
EW1301886-056	26-JUN-2013 15:00	TP10_0.0-0.1_26/06/13		✓		✓		✓	✓	✓
EW1301886-057	26-JUN-2013 15:00	TP10_0.5-0.6_26/06/13			✓					✓
EW1301886-058	26-JUN-2013 15:00	TP10_0.9-1.0_26/06/13	✓							
EW1301886-059	26-JUN-2013 15:00	TP11_0.1-0.2_26/06/13						✓		✓
EW1301886-060	26-JUN-2013 15:00	TP11_0.5-0.6_26/06/13	✓							
EW1301886-061	26-JUN-2013 15:00	TP11_0.9-1.0_26/06/13		✓	✓	✓			✓	✓
EW1301886-062	26-JUN-2013 15:00	TP11_1.4-1.5_26/06/13	✓							
EW1301886-063	26-JUN-2013 15:00	TP12A_0.1-0.2_26/06/...					✓			
EW1301886-064	26-JUN-2013 15:00	TP12_0.0-0.1_26/06/...						✓		✓
EW1301886-065	26-JUN-2013 15:00	TP12_0.5-0.6_26/06/13	✓							
EW1301886-066	26-JUN-2013 15:00	TP12_0.9-1.0_26/06/13			✓					✓
EW1301886-067	26-JUN-2013 15:00	TP8_0.0-0.1_26/06/13		✓		✓			✓	✓
EW1301886-068	26-JUN-2013 15:00	TP8_0.5-0.6_26/06/13	✓							
EW1301886-069	26-JUN-2013 15:00	TP8_0.9-1.0_26/06/13			✓					✓
EW1301886-070	26-JUN-2013 15:00	QC101_26/06/13								✓
EW1301886-071	26-JUN-2013 15:00	QC401_26/06/13								✓
EW1301886-073	27-JUN-2013 10:00	TP7_0.0-0.1_27/06/13	✓							
EW1301886-074	27-JUN-2013 10:00	TP7_0.3-0.4_27/06/13						✓		✓
EW1301886-075	27-JUN-2013 10:00	TP7_0.5-0.6_27/06/13		✓	✓	✓			✓	✓
EW1301886-076	27-JUN-2013 10:00	TP7_0.9-1.0_27/06/13	✓							
EW1301886-077	27-JUN-2013 10:00	TP6_0.0-0.1_27/06/13	✓							
EW1301886-078	27-JUN-2013 10:00	TP6_0.2-0.3_27/06/13								✓
EW1301886-079	27-JUN-2013 10:00	TP6_0.5-0.6_27/06/13			✓					✓
EW1301886-080	27-JUN-2013 10:00	TP6_0.9-1.0_27/06/13	✓							
EW1301886-081	27-JUN-2013 10:00	TP5_0.0-0.1_27/06/13	✓							
EW1301886-082	27-JUN-2013 10:00	TP5_0.5-0.6_27/06/13								✓
EW1301886-083	27-JUN-2013 10:00	QC102_27/06/13								✓
EW1301886-084	27-JUN-2013 10:00	TP5_0.9-1.0_27/06/13		✓	✓	✓			✓	✓



			(On Hold) SOIL No analysis requested	SOIL - EA002 pH (1:5)	SOIL - EA055-103 Moisture Content	SOIL - EA150H Particle Size Analysis by Hydrometer	SOIL - EA200 Asbestos Identification in Soils	SOIL - EA200N Asbestos - Estimated Percentage by	SOIL - ED008 Def Exchangeable Cations with pre-treatment	SOIL - EG005T (solids) Total Metals by ICP-AES
EW1301886-085	27-JUN-2013 10:00	TP5_1.1-1.2_27/06/13	✓							
EW1301886-086	27-JUN-2013 10:00	TP1_0.0-0.1_27/06/13		✓		✓			✓	✓
EW1301886-087	27-JUN-2013 10:00	TP1_0.5-0.6_27/06/13	✓							
EW1301886-088	27-JUN-2013 10:00	TP1_0.9-1.0_27/06/13			✓					✓
EW1301886-089	27-JUN-2013 10:00	TP2_0.0-0.1_27/06/13			✓					✓
EW1301886-090	27-JUN-2013 10:00	TP2_0.2-0.4_27/06/13								✓
EW1301886-091	27-JUN-2013 10:00	TP2_0.9-1.0_27/06/13	✓							
EW1301886-092	27-JUN-2013 10:00	TP3_0.0-0.1_27/06/13						✓		✓
EW1301886-093	27-JUN-2013 10:00	TP3_0.5-0.6_27/06/13		✓	✓	✓			✓	✓
EW1301886-094	27-JUN-2013 10:00	TP3_0.9-1.0_27/06/13	✓							
EW1301886-095	27-JUN-2013 10:00	TP4_0.0-0.1_27/06/13								✓
EW1301886-096	27-JUN-2013 10:00	TP4_0.5-0.6_27/06/13			✓					✓
EW1301886-097	27-JUN-2013 10:00	TP4_0.9-1.0_27/06/13	✓							
EW1301886-098	27-JUN-2013 10:00	QC402_27/06/13								✓
EW1301886-100	27-JUN-2013 15:00	OL1_0.0-0.2_27/06/13			✓					✓
EW1301886-101	27-JUN-2013 15:00	OL1_0.3-0.5_27/06/13			✓					✓
EW1301886-102	27-JUN-2013 15:00	OL2_0.0-0.2_27/06/13			✓					✓
EW1301886-103	27-JUN-2013 15:00	OL2_0.3-0.5_27/06/13			✓					✓

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EK055 (solids) Ammonia as N	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - NT-8S NH3, NO2, NO3, NOX, TKN, TN, TP	SOIL - S-12 OC/OP Pesticides	SOIL - S-24 TPH/BTEX/PAH + Phenols
EW1301886-001	25-JUN-2013 10:00	TP30_0.0-0.1_25/06/13	✓	✓			✓	✓
EW1301886-002	25-JUN-2013 10:00	TP30_0.5-0.6_25/06/13	✓					
EW1301886-005	25-JUN-2013 10:00	TP29_0.3-0.4_25/06/13	✓	✓	✓		✓	✓
EW1301886-007	25-JUN-2013 10:00	TP29_0.9-1.0_25/06/13	✓					
EW1301886-008	25-JUN-2013 15:00	TP27_0.0-0.1_25/06/13	✓					
EW1301886-009	25-JUN-2013 15:00	TP27_0.5-0.6_25/06/13	✓	✓			✓	✓
EW1301886-012	25-JUN-2013 15:00	TP28_0.0-0.1_25/06/13	✓	✓			✓	✓
EW1301886-014	25-JUN-2013 15:00	TP28_0.9-1.0_25/06/13	✓		✓			
EW1301886-017	25-JUN-2013 15:00	TP26_0.5-0.6_25/06/13	✓			✓		
EW1301886-019	25-JUN-2013 15:00	TP26_1.5-1.6_25/06/13	✓	✓		✓	✓	✓
EW1301886-023	25-JUN-2013 15:00	QC400_25/06/13	✓	✓			✓	✓
EW1301886-024	26-JUN-2013 10:00	TP25_0.0-0.1_26/06/13	✓	✓	✓		✓	✓



			SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EK055 (solids) Ammonia as N	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - NT-8S NH3, NO2, NO3, TKN, TN, TP	SOIL - S-12 OC/OP Pesticides	SOIL - S-24 TPH/BTEX/PAH + Phenols
EW1301886-026	26-JUN-2013 10:00	TP25_0.9-1.0_26/06/13	✓					
EW1301886-029	26-JUN-2013 10:00	QC100_26/06/13	✓	✓			✓	✓
EW1301886-030	26-JUN-2013 10:00	TP24_0.0-0.1_26/06/13	✓					
EW1301886-031	26-JUN-2013 10:00	TP24_0.5-0.6_26/06/13	✓	✓	✓		✓	✓
EW1301886-034	26-JUN-2013 10:00	TP20_0.5-0.6_26/06/13	✓	✓	✓	✓	✓	✓
EW1301886-035	26-JUN-2013 10:00	TP20_0.9-1.0_26/06/13	✓					
EW1301886-038	26-JUN-2013 10:00	TP16A_0.2-0.3_26/06/...	✓	✓			✓	✓
EW1301886-039	26-JUN-2013 10:00	TP16A_0.5-0.6_26/06/...	✓	✓			✓	✓
EW1301886-042	26-JUN-2013 10:00	TP15_0.0-0.1_26/06/13	✓	✓			✓	✓
EW1301886-044	26-JUN-2013 10:00	TP15_0.9-1.0_26/06/13	✓		✓			
EW1301886-045	26-JUN-2013 10:00	TP14_0.0-0.1_26/06/13	✓	✓	✓		✓	✓
EW1301886-046	26-JUN-2013 10:00	TP14_0.5-0.6_26/06/13	✓					
EW1301886-050	26-JUN-2013 10:00	TP13_0.5-0.6_26/06/13	✓	✓			✓	✓
EW1301886-052	26-JUN-2013 10:00	TP13_1.5-1.6_26/06/13	✓					
EW1301886-054	26-JUN-2013 15:00	TP9_0.3-0.4_26/06/13	✓	✓			✓	✓
EW1301886-055	26-JUN-2013 15:00	TP9_0.5-0.6_26/06/13	✓		✓			
EW1301886-056	26-JUN-2013 15:00	TP10_0.0-0.1_26/06/13	✓	✓	✓		✓	✓
EW1301886-057	26-JUN-2013 15:00	TP10_0.5-0.6_26/06/13	✓					
EW1301886-059	26-JUN-2013 15:00	TP11_0.1-0.2_26/06/13	✓	✓			✓	✓
EW1301886-061	26-JUN-2013 15:00	TP11_0.9-1.0_26/06/13	✓		✓			
EW1301886-064	26-JUN-2013 15:00	TP12_0.0-0.1_26/06/...	✓	✓			✓	✓
EW1301886-066	26-JUN-2013 15:00	TP12_0.9-1.0_26/06/13	✓					
EW1301886-067	26-JUN-2013 15:00	TP8_0.0-0.1_26/06/13	✓	✓	✓		✓	✓
EW1301886-069	26-JUN-2013 15:00	TP8_0.9-1.0_26/06/13	✓					
EW1301886-070	26-JUN-2013 15:00	QC101_26/06/13	✓	✓			✓	✓
EW1301886-071	26-JUN-2013 15:00	QC401_26/06/13	✓	✓			✓	✓
EW1301886-074	27-JUN-2013 10:00	TP7_0.3-0.4_27/06/13	✓	✓			✓	✓
EW1301886-075	27-JUN-2013 10:00	TP7_0.5-0.6_27/06/13	✓		✓			
EW1301886-078	27-JUN-2013 10:00	TP6_0.2-0.3_27/06/13	✓	✓			✓	✓
EW1301886-079	27-JUN-2013 10:00	TP6_0.5-0.6_27/06/13	✓					
EW1301886-082	27-JUN-2013 10:00	TP5_0.5-0.6_27/06/13	✓	✓			✓	✓
EW1301886-083	27-JUN-2013 10:00	QC102_27/06/13	✓	✓			✓	✓
EW1301886-084	27-JUN-2013 10:00	TP5_0.9-1.0_27/06/13	✓		✓			
EW1301886-086	27-JUN-2013 10:00	TP1_0.0-0.1_27/06/13	✓	✓	✓		✓	✓
EW1301886-088	27-JUN-2013 10:00	TP1_0.9-1.0_27/06/13	✓					
EW1301886-089	27-JUN-2013 10:00	TP2_0.0-0.1_27/06/13	✓					
EW1301886-090	27-JUN-2013 10:00	TP2_0.2-0.4_27/06/13	✓	✓			✓	✓
EW1301886-092	27-JUN-2013 10:00	TP3_0.0-0.1_27/06/13	✓	✓			✓	✓
EW1301886-093	27-JUN-2013 10:00	TP3_0.5-0.6_27/06/13	✓		✓			
EW1301886-095	27-JUN-2013 10:00	TP4_0.0-0.1_27/06/13	✓	✓			✓	✓
EW1301886-096	27-JUN-2013 10:00	TP4_0.5-0.6_27/06/13	✓					



			SOIL - EG035T (solids) Total Mercury by FIMS	SOIL - EK055 (solids) Ammonia as N	SOIL - EP004 (Carbon) Total Organic Carbon (Calc.)	SOIL - NT-8S NH3, NO2, NO3, NOX, TKN, TN, TP	SOIL - S-12 OC/OP Pesticides	SOIL - S-24 TPH/BTEX/PAH + Phenols
EW1301886-098	27-JUN-2013 10:00	QC402_27/06/13	✓	✓			✓	✓
EW1301886-100	27-JUN-2013 15:00	OL1_0.0-0.2_27/06/13	✓					
EW1301886-101	27-JUN-2013 15:00	OL1_0.3-0.5_27/06/13	✓					
EW1301886-102	27-JUN-2013 15:00	OL2_0.0-0.2_27/06/13	✓					
EW1301886-103	27-JUN-2013 15:00	OL2_0.3-0.5_27/06/13	✓					

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EG020T Total Recoverable Metals by ICPMS	WATER - EG035T Total Mercury by FIMS	WATER - W-12 OC/OP Pesticides	WATER - W-24 TPH/BTEX/PAH/Phenols
EW1301886-022	25-JUN-2013 15:00	QC300_25/06/13	✓	✓	✓	✓
EW1301886-072	26-JUN-2013 15:00	QC301_26/06/13	✓	✓	✓	✓
EW1301886-099	27-JUN-2013 10:00	QC302_27/06/13	✓	✓	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

GRMILLER

- *AU Certificate of Analysis - NATA (COA)	Email	grmiller@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	grmiller@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	grmiller@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	grmiller@golder.com.au
- Attachment - Report (SUBCO)	Email	grmiller@golder.com.au
- Chain of Custody (CoC) (COC)	Email	grmiller@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	grmiller@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	grmiller@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	grmiller@golder.com.au

KE YE

- *AU Certificate of Analysis - NATA (COA)	Email	kye@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kye@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kye@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	kye@golder.com.au
- Attachment - Report (SUBCO)	Email	kye@golder.com.au
- Chain of Custody (CoC) (COC)	Email	kye@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	kye@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	kye@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	kye@golder.com.au

MR JIM BAILEY

- A4 - AU Tax Invoice (INV)	Email	Jim.bailey@pkc.com.au

MS CAROLINA OLMOS

- *AU Certificate of Analysis - NATA (COA)	Email	colmos@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	colmos@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	colmos@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	colmos@golder.com.au
- Attachment - Report (SUBCO)	Email	colmos@golder.com.au
- Chain of Custody (CoC) (COC)	Email	colmos@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	colmos@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	colmos@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	colmos@golder.com.au

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 1 of 1

137623028

PKC - Primary School

Ke Ye

24hrs ☐ 48hrs ☐ Standard ☒ 36hrs ☐ 5 Days ☐ Date Required By:

HARD ☐ FAX ☐ DISK ☐ EMAIL ☒ BULLETIN BOARD ☐ PDF ☒ EXCEL ☐ ESDAT ☒ EQUIS ☒

ALS

SY - 493 - 13

GOLDER ASSOCIATES PTY LTD

124 Pacific Highway, Greenwich

Project Manager: Carolina Olmos

Job Contact: Ke Ye

Phone: (02) 9478 3900

Fax: (02) 9478 3901

Reviewed: 0409 212 705

Email: ke@golder.com.au



Comments/Special Instructions:

Please email report to colmos@golder.com.au and grmiller@golder.com.au

1

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTEN/TPH/PAHS/PCBs	OPP/PCP	Ammonia As-N	Total N	BTEN/NO2/NO3/NH4/Total Phosphorus	Asbestos (Individual pieces)	Asbestos (Bulk)	Asbestos (Overwrap)	TPH C6-C9 - BTEN (Trip Blank)
20	TP26-2.0-2.1-25/06/13	25/6	pm	S	1	L										
21	TP26-2.5-2.6-25/06/13	25/6	pm	S	1	L										
22	QC300-25/06/13	25/6	pm	W	4	L										
23	QC800-25/06/13	25/6	pm	S	1	L										
24	TP25-0.0-0.1-26/06/13	26/6	am	S	2+1 bag	L	X	X	X	X						
25	TP25-0.5-0.6-26/06/13	26/6		S	1	L	X	X	X	X						
26	TP25-0.9-1.0-26/06/13	26/6		S	1	L	X									
27	TP25-1.5-1.6-26/06/13	26/6		S	1	L	X									
28	TP25-2.9-3.0-26/06/13	26/6		S	1	L										
29	QC100-26/06/13	26/6		S	1	L										
30	QC200-26/06/13	26/6		S	1	L	X	X	X	X						
31	TP24-0.0-0.1-26/06/13	26/6		S	1	L	X	X	X	X						
32	TP24-0.5-0.6-26/06/13	26/6		S	2+1 bag	L	X	X	X	X						
33	TP24-0.9-1.0-26/06/13	26/6		S	1	L	X	X	X	X						
34	TP20-0.0-0.1-26/06/13	26/6		S	1	L										
35	TP20-0.5-0.6-26/06/13	26/6		S	2+1 bag + 1 bag	L	X	X	X	X						
36	TP20-0.9-1.0-26/06/13	26/6		S	1	L	X									
37	TP20-1.5-1.6-26/06/13	26/6		S	1	L	X									
38	TP10-0.5-0.6-26/06/13	26/6	am	S	1	L										
39	TP10-0.9-1.0-26/06/13	26/6	am	S	1	L										
40	TP10-0.5-0.6-26/06/13	26/6	am	S	1	L	X	X	X	X						

ANALYSIS REQUIRED



EnviroLab Service:
12 Ashley St
Chatswood NSW 2057
Ph: (02) 9410 6200

Job No: 93198

Date Received: 27/11/13

Time Received: 14:00

Received by: AW

Temp: Cool/Ambient

Cooling: Icepack

Security: Intact/Broken/None

SAMPLE MATRIX = Soil/Sediment/Fill/Water/Other

SAMPLE TYPE = Composite(C)/Discrete(DC)/Disturbed(DS)/Core(CR), Grab Sample (GS)

HIGH CONCENTRATION: circle expected parameters in analysis list

SIGNATURE	COMPANY	DATE	TIME
RELEASED BY: <i>Ke Ye</i>	Golder	27/6	1:00
RECEIVED BY: <i>Aneta</i>	ALS	27/6	14:00
RELEASED BY:			
RECEIVED BY:			

SIGNATURE	COMPANY	DATE	TIME	Method of Analysis

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 3 of 3

137623028		ALS		GOLDER ASSOCIATES PTY LTD		Phone: (02) 9478 3900		
PKC - Primary School		SY - 493 - 13		124 Pacific Highway, Greenwich		Fax: (02) 9478 3901		
Ke Ye				Project Manager: Carolina Olmos		Reviewed: 0409 212 705		
24hrs ☐ 48hrs ☐ Standard ☒		Date Required By:		Job Contact: Ke Ye		Email: kym@golder.com.au		
36hrs ☐ 5 Days ☐								
HARD ☐ FAX ☐ DISK ☐ EMAIL ☒ BULLETIN BOARD ☐								
PDF ☒ EXCEL ☐ ESDAT ☒ EQUIS ☒								

Comments/Special Instructions:

Please email report to colmos@golder.com.au and grmiller@golder.com.au

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/Mid/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Tg)	BTX/THP/PAH/Phenols	OCTs + OPPs	Ammonia As N	Total N +TKN+NO2+NO3+NH3+Total Phosphorus	Asbestos Individual pieces	Asbestos Bulk	Asbestos - NEU NGM Analysis	TPH C6-C9 - BTX (Trip Blank)	ANALYSIS REQUIRED
39	TP16A-0.5-0.6-26/06/13	26/6	an	S	1 bag		X	X	X	X		X				
40	TP16A-0.9-1.0-26/06/13	26/6	an	S	1 bag							X				
41	TP16B-0.1-0.2-26/06/13	26/6	an	S	1 + 1 bucket		X	X	X	X						
42	TP15-0.0-0.1-26/06/13	26/6	an	S	1											
43	TP15-0.5-0.6-26/06/13		an	S	1											
44	TP15-0.9-1.0-26/06/13		an	S	2 + 1 bag		X	X	X	X						
45	TP15-0.5-0.6-26/06/13		an	S	2 + 1 bag		X	X	X	X						
46	TP15-0.5-0.6-26/06/13		an	S	1		X									
47	TP15-0.9-1.0-26/06/13		an	S	1											
48	TP15-1.5-1.6-26/06/13		an	S	1											
49	TP13-0.0-0.1-26/06/13		an	S	1											
50	TP13-0.5-0.6-26/06/13		an	S	1 + 15 bucket		X	X	X	X						
51	TP13-0.9-1.0-26/06/13		an	S	1		X									
52	TP13-1.5-1.6-26/06/13		an	S	1											
53	TP9-0.0-0.1-26/06/13		pm	S	1		X	X	X	X						
54	TP9-0.3-0.4-26/06/13		pm	S	1		X	X	X	X						
55	TP9-0.5-0.6-26/06/13		pm	S	2 + 1 bag		X	X	X	X						
56	TP10-0.0-0.1-26/06/13		pm	S	2 + 1 bag		X	X	X	X						
57	TP10-0.5-0.6-26/06/13		pm	S	1		X									
58	TP10-0.9-1.0-26/06/13		pm	S	1											

SAMPLE MATRIX - Soil/Sediment/Fill/Water/Other				SAMPLE TYPE - Composite(CV)/Discrete(DC)/Disturbed(DS)/Core(CR), Grab Sample (GS)				HIGH CONCENTRATION: circle expected parameters in analysis list			
SIGNATURE	COMPANY	DATE	TIME	SIGNATURE	COMPANY	DATE	TIME	Method of Shipment			
RELEASED BY: Euse	Golder	27/6	1:00								
RECEIVED BY: Anefer	ALS	27/6	14:00								
RELEASED BY:											
RECEIVED BY:											

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

Sheet 4 of 42-

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

137623028

PKC - Primary School

Ke Ye

ALS

SY - 493 - 13

GOLDER ASSOCIATES PTY LTD

124 Pacific Highway, Greenwich

Project Manager: Carolina Olmos

Job Contact: Ke Ye

Phone: (02) 9478 3900

Fax: (02) 9478 3901

Resend: 0409 212 705

Email: kye@golder.com.au

24hrs ☐

36hrs ☐

HARD ☐

PDF ☒

48hrs ☐

5 Days ☐

FAX ☐

EXCEL ☐

Standard ☒

Date Required By:

EMAIL ☒

ESDAT ☒

BULLETIN BOARD ☐

EQUIS ☒

Comments/Special Instructions:

Please email report to colmos@golder.com.au and grmiller@golder.com.au

ANALYSIS REQUIRED

Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)

BTEN/TPH/PAHS/Phenols

OCs + OPPs

Ammonia As N

Total N +TKN+NO3+NO2+NH3+Total Phosphorus

Asbestos (individual fibres)

Polychlorinated biphenyls (PCBs)

WORLD

Asbestos (bulk)

Heavy Metals (Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)

TPH/C6-C9 - BTEN (Trip Blank)

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/High/Unclassified)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTEN/TPH/PAHS/Phenols	OCs + OPPs	Ammonia As N	Total N +TKN+NO3+NO2+NH3+Total Phosphorus	Asbestos (individual fibres)	Polychlorinated biphenyls (PCBs)	WORLD	Asbestos (bulk)	Heavy Metals (Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	TPH/C6-C9 - BTEN (Trip Blank)
73	TP7-0.0-0.1	27/06/13	27/6	Am	S	1+15 buckets	X	X	X	X					X		
74	TP7-0.3-0.4	27/06/13			S	2+1 bag	X							X			
75	TP7-0.5-0.6	27/06/13			S	1								X			
76	TP7-0.9-1.0	27/06/13			S	1								X			
77	TP6-0.0-0.1	27/06/13			S	1	X	X	X	X							
78	TP6-0.2-0.3	27/06/13			S	1	X							X			
79	TP6-0.5-0.6	27/06/13			S	1								X			
80	TP6-0.9-1.0	27/06/13			S	1								X			
81	TP5-0.0-0.1	27/06/13			S	1											
82	TP5-0.5-0.6	27/06/13	27/6	Am	S	1	X	X	X	X							
83	QC102	27/06/13			S	1	X	X	X	X							
84	TP05-0.9-1.0	27/06/13			S	2+1 bag	X							X	X		
85	TP5-1.1-1.2	27/06/13			S	2+1 bag	X	X	X	X				X	X		
86	TP4-0.0-0.1	27/06/13			S	1											
87	TP4-0.5-0.6	27/06/13			S	1	X										
88	TP4-0.9-1.0	27/06/13			S	1	X										
89	TP2-0.0-0.1	27/06/13			S	1	X	X	X	X							
90	TP2-0.5-0.6	27/06/13			S	1											

SAMPLE MATRIX = Soil/Sediment/Fill/Water/Other

SAMPLE TYPE = Composite(C)/Discard(DC)/Disturbed(DS)/Core(CR), Grab Sample (GS)

COMPANY

DATE

TIME

SIGNATURE

COMPANY

DATE

TIME

RELEASED BY

RECEIVED BY

RELEASED BY

RECEIVED BY

Ke Ye

Aneta

Golder

ALS

27/6

27/6

14:00

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Signature

Company

Date

Time

Sheet 6 of 6

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

FOR ENVIRO

Environmental Division
NSW South Coast
Work Order
EW1301886

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

137623028

PKC - Primary School

Ke Ye

ALS

SY - 493 - 13

GOLDER ASSOCIATES PTY LTD

4225 3125

99 Kenny Street

124 Pacific Highway, Greenwich

Project Manager:

Carolina Olmos

Job Contact:

Ke Ye

Phone: (02) 9478 3900

Fax: (02) 9478 3901

Reviewed:

0409 212 705

Telephone: 02 42253125



Comments/Special Instructions:

Please email report to colmos@golder.com.au and gpmiller@golder.com.au

- 1 Please put all the samples on hold
- 2 Please forward QC200, QC201, QC202 to Envirolog
- 3 Please send invoice to Port Kembla Corp. (Jim Bailey)

LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	NO CONTAINERS	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTEX/TPH/PAHs/Phenols	OPP4 OCPs	Ammonia As N	Total N (TKN+NO2+NO3+NH3+Total Phosphorus)	Asbestos (Individual Phases)	Asbestos (Total)	PH, TOC, CEC and Iron	ANALYSIS REQUIRED	Hold	Asbestos New Method Analysis	TRI C6-C9 - BTEX (Trip Blank)
1	TP30-0.0-0.1-25/06/13	25/6/13	am	S	1	Low	X	X	X	X								
2	TP30-0.5-0.6-25/06/13		am		1	Low	X	X	X	X								
3	TP30-0.9-1.0-25/06/13		am		1	Low	X	X	X	X								
4	TP29-0.0-0.1-25/06/13		am		1	Low	X	X	X	X								
5	TP29-0.3-0.4-25/06/13		am		1	Low	X	X	X	X								
6	TP29-0.5-0.6-25/06/13		am		1	Low	X	X	X	X								
7	TP29-0.9-1.0-25/06/13		am		1	Low	X	X	X	X								
8	TP27-0.0-0.1-25/06/13		pm		1	Low	X	X	X	X								
9	TP27-0.5-0.6-25/06/13		pm		1	Low	X	X	X	X								
10	TP27-0.9-1.0-25/06/13				1	Low	X	X	X	X								
11	TP27-1.5-1.6-25/06/13				1	Low	X	X	X	X								
12	TP28-0.0-0.1-25/06/13				1	Low	X	X	X	X								
13	TP28-0.5-0.6-25/06/13				1	Low	X	X	X	X								
14	TP28-0.9-1.0-25/06/13				1	Low	X	X	X	X								
15	TP28-1.5-1.6-25/06/13				1	Low	X	X	X	X								
16	TP26-0.0-0.1-25/06/13				1	Low	X	X	X	X								
17	TP26-0.5-0.6-25/06/13				1	Low	X	X	X	X								
18	TP26-0.9-1.0-25/06/13				1	Low	X	X	X	X								
19	TP26-1.5-1.6-25/06/13				1	Low	X	X	X	X								

SAMPLE MATRIX - Soil/Sediment/Fill/Water/Other

RELEASED BY	SIGNATURE	COMPANY	DATE	TIME
RECEIVED BY	hese	Golder	27/6	13:00
RELEASED BY	Aneta	ALS	27/6	14:00
RECEIVED BY				

HIGH CONCENTRATION: circle expected parameters in analysis list

SIGNATURE	COMPANY	DATE	TIME	Method of Release

CERTIFICATE OF ANALYSIS

93198

Client:

Golder Associates Pty Ltd
124 Pacific Highway
St Leonards
NSW 2065

Attention: Ke Ye

Sample log in details:

Your Reference:	<u>137623028, PKC Primary School</u>
No. of samples:	3 Soils
Date samples received / completed instructions received	02/07/2013 / 02/07/2013

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	9/07/13 / 6/07/13
Date of Preliminary Report:	not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:



Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06 /13	QC201_26/06 /13	QC202_27/06 /13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	04/07/2013	04/07/2013	04/07/2013
TRHC ₆ - C ₉	mg/kg	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	107	114

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06 /13	QC201_26/06 /13	QC202_27/06 /13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	04/07/2013	04/07/2013	04/07/2013
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	106	108	100

PAHs in Soil Our Reference: Your Reference	UNITS -----	93198-1 QC200_26/06 /13	93198-2 QC201_26/06 /13	93198-3 QC202_27/06 /13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	03/07/2013	03/07/2013	03/07/2013
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	1.0	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	115	107	104

Organochlorine Pesticides in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	93198-1 QC200_26/06 /13 26/06/2013 Soil	93198-2 QC201_26/06 /13 26/06/2013 Soil	93198-3 QC202_27/06 /13 27/06/2013 Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	04/07/2013	04/07/2013	04/07/2013
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	98	101

Organophosphorus Pesticides				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06 /13	QC201_26/06 /13	QC202_27/06 /13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	04/07/2013	04/07/2013	04/07/2013
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	98	101

Total Phenolics in Soil				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06	QC201_26/06	QC202_27/06
		/13	/13	/13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date extracted	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	03/07/2013	03/07/2013	03/07/2013
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Acid Extractable metals in soil				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06	QC201_26/06	QC202_27/06
		/13	/13	/13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date digested	-	03/07/2013	03/07/2013	03/07/2013
Date analysed	-	03/07/2013	03/07/2013	03/07/2013
Arsenic	mg/kg	6	21	7
Cadmium	mg/kg	2.4	7.3	1.9
Chromium	mg/kg	7	13	8
Copper	mg/kg	540	1,800	130
Nickel	mg/kg	9	12	3
Lead	mg/kg	130	340	17
Zinc	mg/kg	300	360	40
Manganese	mg/kg	360	410	28
Selenium	mg/kg	3	4	<2
Mercury	mg/kg	0.1	0.6	<0.1

Miscellaneous Inorg - soil				
Our Reference:	UNITS	93198-1	93198-2	93198-3
Your Reference	-----	QC200_26/06	QC201_26/06	QC202_27/06
		/13	/13	/13
Date Sampled	-----	26/06/2013	26/06/2013	27/06/2013
Type of sample		Soil	Soil	Soil
Date prepared	-	02/07/2013	02/07/2013	02/07/2013
Date analysed	-	03/07/2013	03/07/2013	03/07/2013
Ammonia as N in soil	mg/kg	2.4	2.0	2.0

Moisture Our Reference: Your Reference	UNITS -----	93198-1 QC200_26/06 /13	93198-2 QC201_26/06 /13	93198-3 QC202_27/06 /13
Date Sampled Type of sample	-----	26/06/2013 Soil	26/06/2013 Soil	27/06/2013 Soil
Date prepared	-	03/07/13	03/07/13	03/07/13
Date analysed	-	04/07/13	04/07/13	04/07/13
Moisture	%	29	38	27

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Inorg-030	Total Phenolics - determined colorimetrically following distillation, based upon APHA 22nd ED 5530 D.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA 22nd ED 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Date analysed	-			04/07/2013	93198-1	04/07/2013 04/07/2013	LCS-3	04/07/2013
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	93198-1	<25 <25	LCS-3	97%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	93198-1	<25 <25	LCS-3	97%
Benzene	mg/kg	0.2	Org-016	<0.2	93198-1	<0.2 <0.2	LCS-3	96%
Toluene	mg/kg	0.5	Org-016	<0.5	93198-1	<0.5 <0.5	LCS-3	92%
Ethylbenzene	mg/kg	1	Org-016	<1	93198-1	<1 <1	LCS-3	101%
m+p-xylene	mg/kg	2	Org-016	<2	93198-1	<2 <2	LCS-3	97%
o-Xylene	mg/kg	1	Org-016	<1	93198-1	<1 <1	LCS-3	103%
naphthalene	mg/kg	1	Org-014	<1	93198-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	134	93198-1	106 113 RPD: 6	LCS-3	95%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Date analysed	-			04/07/2013	93198-1	04/07/2013 04/07/2013	LCS-3	04/07/2013
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	93198-1	<50 <50	LCS-3	110%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	93198-1	<100 <100	LCS-3	122%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	93198-1	<100 <100	LCS-3	114%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	93198-1	<50 <50	LCS-3	110%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	93198-1	100 140 RPD: 33	LCS-3	122%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	93198-1	<100 <100	LCS-3	114%
Surrogate o-Terphenyl	%		Org-003	99	93198-1	106 105 RPD: 1	LCS-3	106%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Date analysed	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	LCS-3	110%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	LCS-3	114%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	0.4 0.5 RPD: 22	LCS-3	101%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	0.1 0.1 RPD: 0	LCS-3	101%

Client Reference: 137623028, PKC Primary School

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base Duplicate %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	0.1 0.2 RPD: 67	LCS-3	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	0.1 0.1 RPD: 0	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	0.2 0.3 RPD: 40	LCS-3	98%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	93198-1	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	93198-1	0.05 0.06 RPD: 18	LCS-3	115%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	114	93198-1	115 113 RPD: 2	LCS-3	108%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base Duplicate %RPD		
Date extracted	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Date analysed	-			04/07/2013	93198-1	04/07/2013 04/07/2013	LCS-3	04/07/2013
HCB	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	103%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	88%
Heptachlor	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	103%
delta-BHC	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	110%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	105%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	90%
Dieldrin	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	108%
Endrin	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	101%
pp-DDD	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	96%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	LCS-3	105%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	98	93198-1	101 102 RPD: 1	LCS-3	100%

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-3	03/07/2013
Date analysed	-			04/07/2013	93198-1	04/07/2013 04/07/2013	LCS-3	04/07/2013
Diazinon	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	LCS-3	98%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	LCS-3	97%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	93198-1	<0.1 <0.1	LCS-3	98%
Surrogate TCMX	%		Org-008	98	93198-1	101 102 RPD: 1	LCS-3	99%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			03/07/2013	[NT]	[NT]	LCS-3	03/07/2013
Date analysed	-			03/07/2013	[NT]	[NT]	LCS-3	03/07/2013
Total Phenolics (as Phenol)	mg/kg	5	Inorg-030	<5	[NT]	[NT]	LCS-3	101%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			03/07/2013	93198-1	03/07/2013 03/07/2013	LCS-2	03/07/2013
Date analysed	-			04/07/2013	93198-1	03/07/2013 03/07/2013	LCS-2	03/07/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	93198-1	6 6 RPD: 0	LCS-2	95%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	93198-1	2.4 2.6 RPD: 8	LCS-2	95%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	7 8 RPD: 13	LCS-2	97%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	540 530 RPD: 2	LCS-2	96%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	9 9 RPD: 0	LCS-2	97%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	130 130 RPD: 0	LCS-2	93%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	300 270 RPD: 11	LCS-2	97%
Manganese	mg/kg	1	Metals-020 ICP-AES	<1	93198-1	360 290 RPD: 22	LCS-2	98%
Selenium	mg/kg	2	Metals-020 ICP-AES	<2	93198-1	3 2 RPD: 40	LCS-2	101%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	93198-1	0.1 0.1 RPD: 0	LCS-2	94%

Client Reference: 137623028, PKC Primary School

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base II Duplicate II %RPD		
Date prepared	-			02/07/2013	[NT]	[NT]	LCS-1	03/07/2013
Date analysed	-			03/07/2013	[NT]	[NT]	LCS-1	03/07/2013
Ammonia as N in soil	mg/kg	0.5	Inorg-057	<0.5	[NT]	[NT]	LCS-1	100%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Moisture								
Date prepared	-			[NT]				
Date analysed	-			[NT]				
Moisture	%	0.1	Inorg-008	[NT]				

Report Comments:

Asbestos ID was analysed by Approved Identifier: Not applicable for this job
 Asbestos ID was authorised by Approved Signatory: Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

SAMPLE RECEIPT ADVICE

Client:

Golder Associates Pty Ltd
124 Pacific Highway
St Leonards NSW 2065

ph: 9478 3900

Fax: 9478 3901

Attention: Ke Ye

Sample log in details:

Your reference:

137623028, PKC Primary School

Envirolab Reference:

93198

Date received:

02/07/2013

Date results expected to be reported:

9/07/13

Samples received in appropriate condition for analysis:

YES

No. of samples provided

3 Soils

Turnaround time requested:

Standard

Temperature on receipt

11.2°C

Cooling Method:

Ice

Sampling Date Provided:

YES

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst

ph: 02 9910 6200 fax: 02 9910 6201

email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CERTIFICATE OF ANALYSIS

Work Order	: ES1322093	Page	: 1 of 15
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Loren Schiavon
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 9478 3901	Facsimile	: +61 2 8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 10-OCT-2013
C-O-C number	: ----	Issue Date	: 17-OCT-2013
Sampler	: KY	No. of samples received	: 28
Site	: PKC - PRIMARY SCHOOL	No. of samples analysed	: 12
Quote number	: SY/493/13		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

LOR = Limit of reporting

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

- **ALS is not NATA accredited for the analysis of Bifenthrin in soils when performed under ALS Method EP068D**
- **EG005T: Poor matrix spike recovery was obtained for Copper on sample ES1322093 - 2. Results have been confirmed by re-extraction and reanalysis.**
- **EG005T: Poor precision was obtained for Manganese on sample ES1322093 - 9 due to sample heterogeneity. Results have been confirmed by re-extraction and reanalysis.**
- **EK057G/EK059G/EK058G:LOR raised for Nitrite/NOx and Nitrate analysis on various samples due to sample matrix.**
- **EK067G: Spike failed for Total P analysis due to matrix interferences(Confirmed by re-digestion and re-analysis)**



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH4-0.4-09/10/13	BH4-1.0-09/10/13	BH5-0.1-09/10/13	BH5-1.0-09/10/13	BH6-0.3-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-002	ES1322093-004	ES1322093-007	ES1322093-009	ES1322093-012
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	19.5	20.1	11.5	20.9	12.1
EG005T: Total Metals by ICP-AES								
Manganese	7439-96-5	5	mg/kg	248	75	161	103	550
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	73	<5	5	11	<5
Cadmium	7440-43-9	1	mg/kg	5	<1	1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	31	6	26	32
Copper	7440-50-8	5	mg/kg	717	79	574	83	130
Lead	7439-92-1	5	mg/kg	404	14	92	44	10
Nickel	7440-02-0	2	mg/kg	24	9	3	7	30
Zinc	7440-66-6	5	mg/kg	798	76	190	31	111
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	<20	30	<20	----	<20
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	20	mg/kg	120	880	----	----	----
EK062: Total Nitrogen as N (TKN + NOx)								
^ Total Nitrogen as N	----	20	mg/kg	120	880	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	2	mg/kg	338	186	----	----	----
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



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH4-0.4-09/10/13	BH4-1.0-09/10/13	BH5-0.1-09/10/13	BH5-1.0-09/10/13	BH6-0.3-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-002	ES1322093-004	ES1322093-007	ES1322093-009	ES1322093-012
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	0.05	mg/kg	<0.05	----	<0.05	----	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	<1	----	<1
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	<2	----	<2



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH4-0.4-09/10/13	BH4-1.0-09/10/13	BH5-0.1-09/10/13	BH5-1.0-09/10/13	BH6-0.3-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-002	ES1322093-004	ES1322093-007	ES1322093-009	ES1322093-012
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)fluoranthene	205-99-2	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								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	<10	----	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	<10	----	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	----	<50	----	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	----	<100	----	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	----	<100	----	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	<50	----	<50



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH4-0.4-09/10/13	BH4-1.0-09/10/13	BH5-0.1-09/10/13	BH5-1.0-09/10/13	BH6-0.3-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-002	ES1322093-004	ES1322093-007	ES1322093-009	ES1322093-012
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 - Continued								
>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
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	77.1	----	86.9	----	79.2
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	64.4	----	85.2	----	74.6
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	110	----	110	----	110
2-Chlorophenol-D4	93951-73-6	0.1	%	110	----	103	----	109
2,4,6-Tribromophenol	118-79-6	0.1	%	95.7	----	95.8	----	104
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	95.8	----	97.6	----	100
Anthracene-d10	1719-06-8	0.1	%	91.2	----	89.6	----	94.1
4-Terphenyl-d14	1718-51-0	0.1	%	85.3	----	82.8	----	86.9
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	91.7	----	99.9	----	104
Toluene-D8	2037-26-5	0.1	%	96.6	----	104	----	102
4-Bromofluorobenzene	460-00-4	0.1	%	100	----	109	----	111



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH6-1.0-09/10/13	BH3-0.1-09/10/13	BH3-1.0-09/10/13	BH2-0.1-09/10/13	BH2-1.0-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-013	ES1322093-015	ES1322093-017	ES1322093-019	ES1322093-021
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	13.4	16.3	27.2	11.6	18.8
EG005T: Total Metals by ICP-AES								
Manganese	7439-96-5	5	mg/kg	87	147	16	92	21
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Arsenic	7440-38-2	5	mg/kg	<5	37	<5	6	<5
Cadmium	7440-43-9	1	mg/kg	<1	3	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	25	20	26	9	30
Copper	7440-50-8	5	mg/kg	137	436	102	82	68
Lead	7439-92-1	5	mg/kg	8	350	9	219	7
Nickel	7440-02-0	2	mg/kg	15	8	3	4	15
Zinc	7440-66-6	5	mg/kg	90	257	54	1150	38
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.2	<0.1	0.2	<0.1
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	----	<20	----
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	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH6-1.0-09/10/13	BH3-0.1-09/10/13	BH3-1.0-09/10/13	BH2-0.1-09/10/13	BH2-1.0-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-013	ES1322093-015	ES1322093-017	ES1322093-019	ES1322093-021
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	0.05	mg/kg	----	<0.05	----	<0.05	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	----	<1	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	<0.5	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	<0.5	----
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	----	<2	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	----	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	----	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	----	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	----	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	----	<0.5	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH6-1.0-09/10/13	BH3-0.1-09/10/13	BH3-1.0-09/10/13	BH2-0.1-09/10/13	BH2-1.0-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-013	ES1322093-015	ES1322093-017	ES1322093-019	ES1322093-021
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
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								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	----	<10	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	----	<10	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	----	<50	----
>C16 - C34 Fraction	----	100	mg/kg	----	<100	----	<100	----
>C34 - C40 Fraction	----	100	mg/kg	----	<100	----	<100	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	----	<50	----	<50	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	----	<50	----	<50	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	----	<0.2	----
Toluene	108-88-3	0.5	mg/kg	----	<0.5	----	<0.5	----
Ethylbenzene	100-41-4	0.5	mg/kg	----	<0.5	----	<0.5	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	----	<0.5	----	<0.5	----
ortho-Xylene	95-47-6	0.5	mg/kg	----	<0.5	----	<0.5	----
^ Sum of BTEX	----	0.2	mg/kg	----	<0.2	----	<0.2	----
^ Total Xylenes	1330-20-7	0.5	mg/kg	----	<0.5	----	<0.5	----
Naphthalene	91-20-3	1	mg/kg	----	<1	----	<1	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH6-1.0-09/10/13	BH3-0.1-09/10/13	BH3-1.0-09/10/13	BH2-0.1-09/10/13	BH2-1.0-09/10/13
				09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00	09-OCT-2013 15:00
Compound	CAS Number	LOR	Unit	ES1322093-013	ES1322093-015	ES1322093-017	ES1322093-019	ES1322093-021
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	79.0	----	78.1	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	68.2	----	77.1	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	108	----	112	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	113	----	103	----
2,4,6-Tribromophenol	118-79-6	0.1	%	----	93.3	----	64.6	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	98.2	----	101	----
Anthracene-d10	1719-06-8	0.1	%	----	92.7	----	90.5	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	86.4	----	84.5	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	96.0	----	96.8	----
Toluene-D8	2037-26-5	0.1	%	----	97.7	----	95.9	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	104	----	98.3	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH1-0.5-09/10/13	BH1-1.0-09/10/13	----	----	----
				09-OCT-2013 15:00	09-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1322093-025	ES1322093-026	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	29.2	19.0	----	----	----
EG005T: Total Metals by ICP-AES								
Manganese	7439-96-5	5	mg/kg	19	<5	----	----	----
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	32	11	----	----	----
Copper	7440-50-8	5	mg/kg	74	49	----	----	----
Lead	7439-92-1	5	mg/kg	8	7	----	----	----
Nickel	7440-02-0	2	mg/kg	6	<2	----	----	----
Zinc	7440-66-6	5	mg/kg	28	17	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EK055: Ammonia as N								
Ammonia as N	7664-41-7	20	mg/kg	----	<20	----	----	----
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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH1-0.5-09/10/13	BH1-1.0-09/10/13	----	----	----
				09-OCT-2013 15:00	09-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1322093-025	ES1322093-026	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued								
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	----	0.05	mg/kg	----	<0.05	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	----	<1	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	----	----
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	----	----
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	----	----
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	----	----
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	----	----
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	----	<2	----	----	----
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)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Client sample ID

Client sampling date / time

				BH1-0.5-09/10/13	BH1-1.0-09/10/13	----	----	----
				09-OCT-2013 15:00	09-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1322093-025	ES1322093-026	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
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	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
C6 - C10 Fraction	C6_C10	10	mg/kg	----	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	----	<10	----	----	----
>C10 - C16 Fraction	>C10_C16	50	mg/kg	----	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	----	<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	----	----	----



Analytical Results

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

Client sample ID

				BH1-0.5-09/10/13	BH1-1.0-09/10/13	----	----	----
Client sampling date / time				09-OCT-2013 15:00	09-OCT-2013 15:00	----	----	----
Compound	CAS Number	LOR	Unit	ES1322093-025	ES1322093-026	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	----	74.9	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	65.0	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	106	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	111	----	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	----	100	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	98.9	----	----	----
Anthracene-d10	1719-06-8	0.1	%	----	90.0	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	84.9	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	----	101	----	----	----
Toluene-D8	2037-26-5	0.1	%	----	96.9	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	----	104	----	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
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	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

Automated Guideline Comparison Report

Work Order	: ES1322093	Page	: 1 of 3
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS		
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9478 3901	Facsimile	: +61-2-8784 8500
Project	: 137623028	Date Received	: 10-OCT-2013
Order number	: ----	Date Analysed	: 14-OCT-2013
C-O-C number	: ----	Date Issued	: 17-OCT-2013
No. of samples received	: 28		
No. of samples analysed	: 12	Quote number	: SY/493/13

General Comments

This guideline comparison report only provides evaluation data where chemical parameters specifically listed within the IWRG 621 (2009) guideline are analysed by ALS using **P-16 package in full**.

This guideline comparison report **only** provides evaluation of total concentration data against upper limit thresholds for the 'Fill Material', 'C', 'B' Categories.

This Automated Guideline Comparison report assesses potential chemical 'contaminants' versus guideline criteria. Other parameters may impact classification and 95% upper control limits may also be applied – refer to EPA Victoria's Industrial Waste Resource Regulatory Framework and associated Guidelines.

If the total concentration of Polychlorinated biphenyls is equal to, or exceeds, the upper limit threshold for the 'Fill Material' Category, please refer to Note 6 in EPA Victoria Publication IWRG 621 (2009).

Red shading is applied where the result is equal to or greater than the guideline upper limit. Red shading is not applied to the Summary of Thresholds Reached or Exceeded.

For the 'Summary of Thresholds Reached or Exceeded' to accurately function, all samples must be analysed and included in the 'Analytical Results' section of the following report. Please verify that all required sample IDs are listed and analysed.



Summary of Thresholds Reached or Exceeded

Results for all samples detailed in this report do not exceed threshold limits for fill material.



Analytical Results

Sub-Matrix:				Client sample ID		Guideline Lower Limit	Guideline Upper Limit	----	----	----	----	----
				Sampling date/time				----	----	----	----	----
Compound	Method	LOR	Unit	----	----			----	----	----	----	
		-	-	----	----	----	----	----	----	----	----	

QUALITY CONTROL REPORT

Work Order	: ES1322093	Page	: 1 of 14
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Loren Schiavon
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 9478 3901	Facsimile	: +61 2 8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: PKC - PRIMARY SCHOOL	Date Samples Received	: 10-OCT-2013
C-O-C number	: ----	Issue Date	: 17-OCT-2013
Sampler	: KY	No. of samples received	: 28
Order number	: ----	No. of samples analysed	: 12
Quote number	: SY/493/13		

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

This Quality Control Report contains the following information:

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



General Comments

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

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

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

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

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



NATA Accredited
Laboratory 825

Accredited for
compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Hoa Nguyen	Senior Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 3107649)									
ES1322093-007	BH5-0.1-09/10/13	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	11.5	12.3	7.1	0% - 50%
ES1322142-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	4.8	5.4	12.7	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3107025)									
ES1322093-002	BH4-0.4-09/10/13	EG005T: Cadmium	7440-43-9	1	mg/kg	5	6	19.1	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	31	16.4	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	24	28	14.6	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	73	67	8.8	0% - 50%
		EG005T: Copper	7440-50-8	5	mg/kg	717	813	12.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	404	432	6.8	0% - 20%
		EG005T: Manganese	7439-96-5	5	mg/kg	248	264	6.2	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	798	854	6.7	0% - 20%
ES1322093-009	BH5-1.0-09/10/13	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	26	26	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	7	6	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	11	6	56.6	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	83	89	6.6	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	44	18	83.3	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	103	63	# 47.9	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	31	27	14.7	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3107026)									
ES1322093-002	BH4-0.4-09/10/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1322093-009	BH5-1.0-09/10/13	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EK055: Ammonia as N (QC Lot: 3109190)									
ES1322093-007	BH5-0.1-09/10/13	EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	<20	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3105009)									
ES1322093-002	BH4-0.4-09/10/13	EK057G: Nitrite as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 3105010)									
ES1322093-002	BH4-0.4-09/10/13	EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<1.0	<1.0	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 3105385)									
ES1322093-002	BH4-0.4-09/10/13	EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	120	180	39.8	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3105386)									
ES1322093-002	BH4-0.4-09/10/13	EK067G: Total Phosphorus as P	----	2	mg/kg	338	363	7.2	0% - 20%



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3105573)									
ES1322154-016	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
ES1322093-007	BH5-0.1-09/10/13	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP068A: Organochlorine Pesticides (OC) (QC Lot: 3105573) - continued									
ES1322093-007	BH5-0.1-09/10/13	EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 3104577)									
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1322094-011	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3104577)									
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3104577) - continued									
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322094-011	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3104576)									
ES1322093-002	BH4-0.4-09/10/13	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1322094-011	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3106443)									
ES1322142-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1322142-009	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3104576)									
ES1322093-002	BH4-0.4-09/10/13	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit

Page : 7 of 14
 Work Order : ES1322093
 Client : GOLDER ASSOCIATES
 Project : 137623028



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 (QC Lot: 3104576) - continued									
ES1322094-011	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QC Lot: 3106443)									
ES1322142-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1322142-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 3106443)									
ES1322142-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1322142-009	Anonymous	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
		EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit		



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

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

Sub-Matrix: **SOIL**

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
EG005T: Total Metals by ICP-AES (QCLot: 3107025)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	120	87	129
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	103	80	122
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	129	71	133
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	118	86	128
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	112	81	123
EG005T: Manganese	7439-96-5	5	mg/kg	<5	130 mg/kg	123	85	127
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	116	84	130
EG005T: Selenium	7782-49-2	5	mg/kg	<5	5.37 mg/kg	126	75	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	116	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3107026)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	85.1	66	112
EK055: Ammonia as N (QCLot: 3109190)								
EK055: Ammonia as N	7664-41-7	20	mg/kg	<20	125 mg/kg	93.1	63	113
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3105009)								
EK057G: Nitrite as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	94.0	82	120
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3105010)								
EK059G: Nitrite + Nitrate as N (Sol.)	----	0.1	mg/kg	<0.1	2.5 mg/kg	110	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3105385)								
EK061G: Total Kjeldahl Nitrogen as N	----	20	mg/kg	<20	500 mg/kg	94.0	70	127
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3105386)								
EK067G: Total Phosphorus as P	----	2	mg/kg	<2	442 mg/kg	97.8	69	124
EP068A: Organochlorine Pesticides (OC) (QCLot: 3105573)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	80.3	71	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	66	122
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	78.7	69	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	71	115
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	76.0	65	113
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.1	68	116
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.2	68	118
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	83.2	68	116
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	76.9	68	120
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.3	69	119
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	81.4	67	121
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	75.8	66	118



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: 3105573) - continued								
EP068: 4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	74.9	69	117
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.6	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	80.7	76	120
EP068: 4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	76	120
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	72.4	57.3	115
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.5	60	124
EP068: 4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	79.2	67	127
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	87.0	65	123
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	81.6	65	129
EP075(SIM)A: Phenolic Compounds (QCLot: 3104577)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	102	74	116
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	107	74	116
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	100	72	116
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	106	69	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	82.3	60.3	117
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	106	69	117
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	105	68	112
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	109	73	117
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	104	76.4	114
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	85.6	57	111
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	94.9	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	41.2	3.9	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3104577)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	108	80	124
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	108	77	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	109	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	108	77	123
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	113	79	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	79	123
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	115	79	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	104	73	121
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	110	81	123
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	98.9	70	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	106	77	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	105	76	122
EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	102	71	113
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	103	71.7	113
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	99.8	72.4	114

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
EG005T: Total Metals by ICP-AES (QCLot: 3107025)							
ES1322093-002	BH4-0.4-09/10/13	EG005T: Arsenic	7440-38-2	50 mg/kg	96.5	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	110	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	# 174	70	130
		EG005T: Lead	7439-92-1	125 mg/kg	112	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Selenium	7782-49-2	50 mg/kg	99.0	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	113	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3107026)							



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
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3107026) - continued							
ES1322093-002	BH4-0.4-09/10/13	EG035T: Mercury	7439-97-6	5 mg/kg	101	70	130
EK055: Ammonia as N (QCLot: 3109190)							
ES1322093-012	BH6-0.3-09/10/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	82.0	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3105009)							
ES1322093-002	BH4-0.4-09/10/13	EK057G: Nitrite as N (Sol.)	----	2.5 mg/kg	98.0	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3105010)							
ES1322093-002	BH4-0.4-09/10/13	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	104	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3105385)							
ES1322093-002	BH4-0.4-09/10/13	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	111	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3105386)							
ES1322093-002	BH4-0.4-09/10/13	EK067G: Total Phosphorus as P	----	100 mg/kg	# 59.9	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 3105573)							
ES1322154-016	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	93.2	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	107	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	91.3	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	95.8	70	130
		EP068: Endrin	72-20-8	2 mg/kg	101	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	104	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3104577)							
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	105	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	101	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.2	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	102	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3104577)							
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	98.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	100	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3104576)							
ES1322093-002	BH4-0.4-09/10/13	EP071: C10 - C14 Fraction	----	640 mg/kg	81.4	73	137
		EP071: C15 - C28 Fraction	----	3140 mg/kg	81.8	53	131
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.6	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3106443)							
ES1322142-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.3	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3104576)							
ES1322093-002	BH4-0.4-09/10/13	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	73	137

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

Sub-Matrix: SOIL

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3104576)										
ES1322093-002	BH4-0.4-09/10/13	EP071: C10 - C14 Fraction	----	640 mg/kg	81.4	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	3140 mg/kg	81.8	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	2860 mg/kg	71.6	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3104576)										
ES1322093-002	BH4-0.4-09/10/13	EP071: >C10 - C16 Fraction	>C10_C16	850 mg/kg	102	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	4800 mg/kg	75.5	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	2400 mg/kg	53.9	----	52	132	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 3104577)										
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Phenol	108-95-2	10 mg/kg	105	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	101	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	83.2	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	102	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	55.8	----	20	130	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3104577)										
ES1322093-002	BH4-0.4-09/10/13	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	98.6	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	100	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3105009)										



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3105009) - continued										
ES1322093-002	BH4-0.4-09/10/13	EK057G: Nitrite as N (Sol.)	----	2.5 mg/kg	98.0	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3105010)										
ES1322093-002	BH4-0.4-09/10/13	EK059G: Nitrite + Nitrate as N (Sol.)	----	2.5 mg/kg	104	----	70	130	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3105385)										
ES1322093-002	BH4-0.4-09/10/13	EK061G: Total Kjeldahl Nitrogen as N	----	500 mg/kg	111	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3105386)										
ES1322093-002	BH4-0.4-09/10/13	EK067G: Total Phosphorus as P	----	100 mg/kg	# 59.9	----	70	130	----	----
EP068A: Organochlorine Pesticides (OC) (QCLot: 3105573)										
ES1322154-016	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	93.2	----	70	130	----	----
		EP068: Heptachlor	76-44-8	0.5 mg/kg	107	----	70	130	----	----
		EP068: Aldrin	309-00-2	0.5 mg/kg	91.3	----	70	130	----	----
		EP068: Dieldrin	60-57-1	0.5 mg/kg	95.8	----	70	130	----	----
		EP068: Endrin	72-20-8	2 mg/kg	101	----	70	130	----	----
		EP068: 4,4`-DDT	50-29-3	2 mg/kg	104	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3106443)										
ES1322142-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.3	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 (QCLot: 3106443)										
ES1322142-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.4	----	70	130	----	----
EP080: BTEXN (QCLot: 3106443)										
ES1322142-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	80.6	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	89.2	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	97.4	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	107	----	70	130	----	----
			106-42-3							
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	99.0	----	70	130	----	----
	EP080: Naphthalene	91-20-3	2.5 mg/kg	79.6	----	70	130	----	----	
EG005T: Total Metals by ICP-AES (QCLot: 3107025)										
ES1322093-002	BH4-0.4-09/10/13	EG005T: Arsenic	7440-38-2	50 mg/kg	96.5	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	110	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	# 174	----	70	130	----	----
		EG005T: Lead	7439-92-1	125 mg/kg	112	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	106	----	70	130	----	----
		EG005T: Selenium	7782-49-2	50 mg/kg	99.0	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	113	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3107026)										
ES1322093-002	BH4-0.4-09/10/13	EG035T: Mercury	7439-97-6	5 mg/kg	101	----	70	130	----	----



Sub-Matrix: SOIL

Sub-Matrix: SOIL				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	EK055: Ammonia as N (QCLot: 3109190)						
ES1322093-012	BH6-0.3-09/10/13	EK055: Ammonia as N	7664-41-7	50 mg/kg	82.0	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: ES1322093	Page	: 1 of 8
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Loren Schiavon
Address	: LEVEL 1, 124 PACIFIC HIGHWAY ST LEONARDS NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: loren.schiavon@alsglobal.com
Telephone	: +61 02 9478 3900	Telephone	: +61 2 8784 8503
Facsimile	: +61 02 9478 3901	Facsimile	: +61 2 8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: PKC - PRIMARY SCHOOL	Date Samples Received	: 10-OCT-2013
C-O-C number	: ----	Issue Date	: 17-OCT-2013
Sampler	: KY	No. of samples received	: 28
Order number	: ----	No. of samples analysed	: 12
Quote number	: SY/493/13		

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with recommended holding times (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
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)		09-OCT-2013	----	----	----	15-OCT-2013	23-OCT-2013	✓
BH4-0.4-09/10/13,	BH4-1.0-09/10/13,							
BH5-0.1-09/10/13,	BH5-1.0-09/10/13,							
BH6-0.3-09/10/13,	BH6-1.0-09/10/13,							
BH3-0.1-09/10/13,	BH3-1.0-09/10/13,							
BH2-0.1-09/10/13,	BH2-1.0-09/10/13,							
BH1-0.5-09/10/13,	BH1-1.0-09/10/13							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)		09-OCT-2013	15-OCT-2013	07-APR-2014	✓	16-OCT-2013	07-APR-2014	✓
BH4-0.4-09/10/13,	BH4-1.0-09/10/13,							
BH5-0.1-09/10/13,	BH5-1.0-09/10/13,							
BH6-0.3-09/10/13,	BH6-1.0-09/10/13,							
BH3-0.1-09/10/13,	BH3-1.0-09/10/13,							
BH2-0.1-09/10/13,	BH2-1.0-09/10/13,							
BH1-0.5-09/10/13,	BH1-1.0-09/10/13							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)		09-OCT-2013	15-OCT-2013	06-NOV-2013	✓	16-OCT-2013	06-NOV-2013	✓
BH4-0.4-09/10/13,	BH4-1.0-09/10/13,							
BH5-0.1-09/10/13,	BH5-1.0-09/10/13,							
BH6-0.3-09/10/13,	BH6-1.0-09/10/13,							
BH3-0.1-09/10/13,	BH3-1.0-09/10/13,							
BH2-0.1-09/10/13,	BH2-1.0-09/10/13,							
BH1-0.5-09/10/13,	BH1-1.0-09/10/13							
EK055: Ammonia as N								
Soil Glass Jar - Unpreserved (EK055)		09-OCT-2013	----	----	----	16-OCT-2013	07-APR-2014	✓
BH4-0.4-09/10/13,	BH4-1.0-09/10/13,							
BH5-0.1-09/10/13,	BH6-0.3-09/10/13,							
BH3-0.1-09/10/13,	BH2-0.1-09/10/13,							
BH1-1.0-09/10/13								
EK057G: Nitrite as N by Discrete Analyser								
Soil Glass Jar - Unpreserved (EK057G)		09-OCT-2013	15-OCT-2013	07-APR-2014	✓	15-OCT-2013	07-APR-2014	✓
BH4-0.4-09/10/13,	BH4-1.0-09/10/13							



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
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK059G) BH4-0.4-09/10/13, BH4-1.0-09/10/13	09-OCT-2013	15-OCT-2013	07-APR-2014	✓	15-OCT-2013	07-APR-2014	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Soil Glass Jar - Unpreserved (EK061G) BH4-0.4-09/10/13, BH4-1.0-09/10/13	09-OCT-2013	15-OCT-2013	07-APR-2014	✓	15-OCT-2013	07-APR-2014	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Soil Glass Jar - Unpreserved (EK067G) BH4-0.4-09/10/13, BH4-1.0-09/10/13	09-OCT-2013	15-OCT-2013	07-APR-2014	✓	15-OCT-2013	07-APR-2014	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	16-OCT-2013	23-OCT-2013	✓	16-OCT-2013	25-NOV-2013	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	14-OCT-2013	23-OCT-2013	✓	15-OCT-2013	23-NOV-2013	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	14-OCT-2013	23-OCT-2013	✓	16-OCT-2013	23-NOV-2013	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	14-OCT-2013	23-OCT-2013	✓	16-OCT-2013	23-NOV-2013	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	15-OCT-2013	23-OCT-2013	✓	15-OCT-2013	23-OCT-2013	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013							
Soil Glass Jar - Unpreserved (EP080) BH4-0.4-09/10/13, BH5-0.1-09/10/13, BH6-0.3-09/10/13, BH3-0.1-09/10/13, BH2-0.1-09/10/13, BH1-1.0-09/10/13	09-OCT-2013	15-OCT-2013	23-OCT-2013	✓	15-OCT-2013	23-OCT-2013	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Buchi Ammonia	EK055	1	7	14.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Moisture Content	EA055-103	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	6	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	2	50.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	2	12	16.7	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	6	16.7	9.5	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	1	5	20.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	2	18	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Buchi Ammonia	EK055	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	3	6	50.0	14.3	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosporus By Discrete Analyser	EK067G	3	5	60.0	15.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Buchi Ammonia	EK055	1	7	14.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	6	16.7	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	6	16.7	4.8	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB) - Continued							
Total Phosphorus By Discrete Analyser	EK067G	1	5	20.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Buchi Ammonia	EK055	1	7	14.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx)- Soluble by Discrete Analyser	EK059G	1	6	16.7	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N - Soluble by Discrete Analyser	EK057G	1	2	50.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	1	18	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	12	8.3	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TKN as N By Discrete Analyser	EK061G	1	6	16.7	4.8	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus By Discrete Analyser	EK067G	1	5	20.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	18	5.6	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	20	5.0	5.0	✔	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 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)
Buchi Ammonia	EK055	SOIL	APHA 21st ed., 4500 NH ₃ -B&G, H Samples are steam distilled (Buchi) prior to analysis and quantified using titration, FIA or Discrete Analyser.
Nitrite as N - Soluble by Discrete Analyser	EK057G	SOIL	APHA 21st ed., 4500 NO ₃ - B. Nitrite in a water extract is determined by direct colourimetry by Discrete Analyser.
Nitrate as N - Soluble by Discrete Analyser	EK058G	SOIL	APHA 21st ed., 4500 NO ₃ --F. Nitrate in the 1:5 soil:water extract is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results.
Nitrite and Nitrate as N (NO _x) - Soluble by Discrete Analyser	EK059G	SOIL	APHA 21st ed., 4500 NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) in a water extract is determined by Chemical Reduction, and direct colourimetry by Discrete Analyser.
TKN as N By Discrete Analyser	EK061G	SOIL	APHA 21st ed., 4500-Norg-D Soil samples are digested using Kjeldahl digestion followed by determination by Discrete Analyser.
Total Nitrogen as N (TKN + NO _x) By Discrete Analyser	EK062G	SOIL	APHA 21st ed., 4500 Norg/NO ₃ - Total Nitrogen is determined as the sum of TKN and Oxidised Nitrogen, each determined seperately as N.
Total Phosphorus By Discrete Analyser	EK067G	SOIL	APHA 21st ed., 4500 P-B&F This procedure involves sulfuric acid digestion and quantification using Discrete Analyser.
Pesticides by GCMS	EP068	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TPH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (2013) Schedule B(3) (Method 506.1)
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TPH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 501)



Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids (Option A - Concentrating)	ORG17A	SOIL	In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Tumbler Extraction of Solids (Option B - Non-concentrating)	ORG17B	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.



Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005T: Total Metals by ICP-AES	ES1322093-009	BH5-1.0-09/10/13	Manganese	7439-96-5	47.9 %	0-20%	RPD exceeds LOR based limits
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	ES1322093-002	BH4-0.4-09/10/13	Copper	7440-50-8	174 %	70-130%	Recovery greater than upper data quality objective
EK067G: Total Phosphorus as P by Discrete Analyser	ES1322093-002	BH4-0.4-09/10/13	Total Phosphorus as P	----	59.9 %	70-130%	Recovery less than lower data quality objective

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

Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1322093**

Client : **GOLDER ASSOCIATES**
 Contact : **MS CAROLINA OLMOS**
 Address : **LEVEL 1, 124 PACIFIC HIGHWAY**
ST LEONARDS NSW, AUSTRALIA
2065

Laboratory : Environmental Division Sydney
 Contact : **Loren Schiavon**
 Address : **277-289 Woodpark Road Smithfield**
NSW Australia 2164

E-mail : **colmos@golder.com.au**
 Telephone : **+61 02 9478 3900**
 Facsimile : **+61 02 9478 3901**

E-mail : **loren.schiavon@alsglobal.com**
 Telephone : **+61 2 8784 8503**
 Facsimile : **+61 2 8784 8500**

Project : **137623028**
 Order number : **----**
 C-O-C number : **----**
 Site : **PKC - PRIMARY SCHOOL**
 Sampler : **KY**

Page : **1 of 3**
 Quote number : **ES2013GOLASS0484 (SY/493/13)**
 QC Level : **NEPM 2013 Schedule B(3) and ALS**
QCS3 requirement

Dates

Date Samples Received : **10-OCT-2013**
 Client Requested Due Date : **17-OCT-2013**

Issue Date : **14-OCT-2013 08:46**
 Scheduled Reporting Date : **17-OCT-2013**

Delivery Details

Mode of Delivery : **Carrier**
 No. of coolers/boxes : **2 HARD**
 Security Seal : **Intact.**

Temperature : **8.6°C - Ice present**
 No. of samples received : **28**
 No. of samples analysed : **12**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exist.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

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

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL	No analysis requested SOIL - EA055-103	Moisture Content	SOIL - EG005T (solids) Total Metals by ICP-AES	SOIL - EK055 (solids)	Ammonia as N	SOIL - EP068A (solids) Organochlorine Pesticides by GC/MS	SOIL - NT-8S NH3, NO2, NO3, TKN, TN, TP	SOIL - S-02 8 Metals (incl. Digestion)	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1322093-001	09-OCT-2013 15:00	BH4-0.1-09/10/13	✓									
ES1322093-002	09-OCT-2013 15:00	BH4-0.4-09/10/13				✓			✓	✓		✓
ES1322093-003	09-OCT-2013 15:00	BH4-0.8-09/10/13	✓									
ES1322093-004	09-OCT-2013 15:00	BH4-1.0-09/10/13		✓	✓					✓	✓	
ES1322093-005	09-OCT-2013 15:00	BH4-1.8-09/10/13	✓									
ES1322093-006	09-OCT-2013 15:00	BH4-2.2-09/10/13	✓									
ES1322093-007	09-OCT-2013 15:00	BH5-0.1-09/10/13				✓	✓	✓				✓
ES1322093-008	09-OCT-2013 15:00	BH5-0.3-09/10/13	✓									
ES1322093-009	09-OCT-2013 15:00	BH5-1.0-09/10/13		✓	✓						✓	
ES1322093-010	09-OCT-2013 15:00	BH5-1.5-09/10/13	✓									
ES1322093-011	09-OCT-2013 15:00	BH6-0.1-09/10/13	✓									
ES1322093-012	09-OCT-2013 15:00	BH6-0.3-09/10/13				✓	✓	✓				✓
ES1322093-013	09-OCT-2013 15:00	BH6-1.0-09/10/13		✓	✓						✓	
ES1322093-014	09-OCT-2013 15:00	BH6-2.0-09/10/13	✓									
ES1322093-015	09-OCT-2013 15:00	BH3-0.1-09/10/13				✓	✓	✓				✓
ES1322093-016	09-OCT-2013 15:00	BH3-0.4-09/10/13	✓									
ES1322093-017	09-OCT-2013 15:00	BH3-1.0-09/10/13		✓	✓						✓	
ES1322093-018	09-OCT-2013 15:00	BH3-1.7-09/10/13	✓									
ES1322093-019	09-OCT-2013 15:00	BH2-0.1-09/10/13				✓	✓	✓				✓
ES1322093-020	09-OCT-2013 15:00	BH2-0.5-09/10/13	✓									
ES1322093-021	09-OCT-2013 15:00	BH2-1.0-09/10/13		✓	✓						✓	
ES1322093-022	09-OCT-2013 15:00	BH2-2.0-09/10/13	✓									
ES1322093-023	09-OCT-2013 15:00	BH2-2.5-09/10/13	✓									
ES1322093-024	09-OCT-2013 15:00	BH1-0.1-09/10/13	✓									
ES1322093-025	09-OCT-2013 15:00	BH1-0.5-09/10/13		✓	✓						✓	
ES1322093-026	09-OCT-2013 15:00	BH1-1.0-09/10/13				✓	✓	✓				✓
ES1322093-027	10-OCT-2013 15:00	WC01-10/10/13	✓									
ES1322093-028	10-OCT-2013 15:00	WC02-10/10/13	✓									

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

MR GRAEME MILLER

- *AU Certificate of Analysis - NATA (COA)	Email	grmiller@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	grmiller@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	grmiller@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	grmiller@golder.com.au
- Chain of Custody (CoC) (COC)	Email	grmiller@golder.com.au
- Chromatogram (CHROM)	Email	grmiller@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	grmiller@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	grmiller@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	grmiller@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	grmiller@golder.com.au

MR KE YE

- *AU Certificate of Analysis - NATA (COA)	Email	KYe@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	KYe@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	KYe@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	KYe@golder.com.au
- A4 - AU Tax Invoice (INV)	Email	KYe@golder.com.au
- Chain of Custody (CoC) (COC)	Email	KYe@golder.com.au
- Chromatogram (CHROM)	Email	KYe@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	KYe@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	KYe@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	KYe@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	KYe@golder.com.au

MS CAROLINA OLMOS

- *AU Certificate of Analysis - NATA (COA)	Email	colmos@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	colmos@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	colmos@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	colmos@golder.com.au
- A4 - AU Tax Invoice (INV)	Email	colmos@golder.com.au
- AU IWRG 621 2009 Guideline Report (COA_GL_IWRG_621)	Email	colmos@golder.com.au
- Chain of Custody (CoC) (COC)	Email	colmos@golder.com.au
- Chromatogram (CHROM)	Email	colmos@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	colmos@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	colmos@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	colmos@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	colmos@golder.com.au

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 7 of 2

Reference No: 137623028		ALS	
PKC - Primary School		SY - 493 - 13	
Ke Ye			
24hrs ☐	48hrs ☐	Standard ☒	
30hrs ☐	5 Days ☐	Date Required By:	
Delivery Method: HARD ☐ FAX ☐ DISK ☐	EMAIL ☒	BULLETIN BOARD ☐	
Approved: PDF ☒ EXCEL ☐	ESDAT ☒	FOUIS ☒	

Comments/Special Instructions: Please email report to colmos@golder.com.au and grriller@golder.com.au . Ke Ye @ Golder.com.au		GOLDR ASSOCIATES PTY LTD 124 Pacific Highway, Greenfield Project Manager: Carolina Olmos Job Contact: Ke Ye	Phone: (02) 9478 3900 Fax: (02) 9478 3901 Backorder: 0409 212 705 Email: hsy@golder.com.au

ANALYSIS REQUIRED	
Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	
BTEX/TPHs/PAHS/Phenols	
OPPs + OCPs	
Ammonia As N	
Total N +TKN+NO2+NO3+NH3+Total Phosphorus	
Asbestos	
Particle Size, pH, TOC, CEC and Iron	
TPH C6-C9 - BTEX (Trip Blank)	

LAB	SAMPLE	ID	DATE	SAMPLE	SAMPLE	SAMPLE	
ID				TIME	MATRIX		
1	PH4-0.1-0.09/10/13		9/10/13	04	S	1	UN
2	PH4-0.2-0.1						
3	PH4-0.3-0.1						
4	PH4-0.4-0.1						
5	PH4-0.5-0.1						
6	PH4-0.6-0.1						
7	PH4-0.7-0.1						
8	PH4-0.8-0.1						
9	PH4-0.9-0.1						
10	PH4-1.0-0.1						
11	PH4-1.1-0.1						
12	PH4-1.2-0.1						
13	PH4-1.3-0.1						
14	PH4-1.4-0.1						
15	PH4-1.5-0.1						
16	PH4-1.6-0.1						
17	PH4-1.7-0.1						
18	PH4-1.8-0.1						
19	PH4-1.9-0.1						
20	PH4-2.0-0.1						

Environmental Division
 Sydney
 Work Order
ES1322093



Telephone : +61-2-8784 8555

SAMPLE MATRIX - Soil/Sediment/Fill/Water/Oiler		SAMPLE TYPE - Composite(C)/Discrete(D)/Grab Sample(GS)		HIGH CONCENTRATION: circle expected parameters in analysis list	
SIGNATURE	COMPANY	DATE	TIME	SIGNATURE	COMPANY
RELEASED BY: <i>Ke Ye</i>	<i>Golder</i>	10/10/13	1:30 PM		
RECEIVED BY:					
RECEIVED BY:					

TO BE FILLED OUT BY ANALYST IN LABORATORY		DATE		TIME		Method of Shipment	

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 2 of 2

Project No: 137623028		ALS	
Site: PKC - Primary School		SY - 493 - 13	
SAP: Ke Ye		Standard	
24hrs ☐ 48hrs ☐ 5 days ☐		Date Required By:	
HARD ☐ FAX ☐ DISK ☐ EMAIL ☐		BULLETIN BOARD ☐	
PDF ☐ EXCEL ☐		ESD ☐ EQUIS ☐	

Comments/Special Instructions:

Please email report to colmos@golder.com.au and grunber@golder.com.au

KYE @ golder. au

GOLDER ASSOCIATES PTY LTD

124 Pacific Highway, Greenwich

Project Manager: Carolina Olmos

Job Contact: Ke Ye

Phone: (02) 9478 3900

Fax: (02) 9478 3901

Mobile: 0409 212 705

Email: kye@golder.com.au

LAB	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	No CONTAINERS	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTEX/TPHs/PAHs/Phenols	OPPs + OCPs	Ammonia As N	Total N +TKN+NO2+NO3+NH3+Total Phosphorus	Asbestos	Particle Size, pH, TOC, CEC and Iron	TPH C6-C9 - BTEX (Trip Blank)
21	PH2-1.0	09/10/13	9/11/13	PH	5	UR								
22	PH2-2.0													
23	PH2-2.5													
24	PH2-0.1													
25	PH2-0.5													
26	PH2-1.0													
27	WC01-10/10/13	10/10	am	5	1	UR								
28	WC02-10/10/13	10/10	am	5	1	UR								

SAMPLE MATRIX - Soil/Sediment/Fill/Water/Other		SAMPLE TYPE - Composite/Discrete/DO/Slur (DS)/Core/CH, Grab Sample (GS)		HIGH CONCENTRATION: circle expected parameters in analysis list	
SIGNATURE	COMPANY	DATE	TIME	SIGNATURE	COMPANY
Ke Ye	Golder	10/10/13	16:00		

RELEASED BY	RECEIVED BY	DATE	TIME	METHOD OF SHIPMENT
Ke Ye	Ke Ye	10/10/13	16:00	

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 2 of 2

137623028 PKC - Primary School Ke Ye		ALS SY - 493 - 13		GOLDER ASSOCIATES PTY LTD 174 Pacific Highway, Newcastle Project Manager: Carolina Olmos Job Contact: Ke Ye		Phone: (03) 9478 5900 Fax: (03) 9478 5901 Email: info@golder.com.au	
24hrs ☐ 48hrs ☐ Standard ☒ 36hrs ☐ 5 Days ☐		Date Required By:		BULLETIN BOARD ☐ EQUIS ☒		ANALYSIS REQUIRED	
HARD ☐ FAX ☐ DISK ☐ EMAIL ☐ ESDAT ☐ EXCEL ☐		PDF ☐		Comments/Special Instructions: Please email report to colmos@golder.com.au and gruller@golder.com.au		TPF C6-C9 - BTEX (Trip Blank)	
k7r @ golder. au		No CONTAINERS		Level of Contamination (Low/High/Unknown)		Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	
BTEX/TPH/PAHs/Phenols		Ammonia As N		Total N +TKN+NO2+NO3+NH4+Total Phosphorus		Asbestos	
Particle Size, pH, TOC, CEC and Iron		Portals Size, pH, TOC, CEC and Iron		TPF C6-C9 - BTEX (Trip Blank)		ANALYSIS REQUIRED	
LAB	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	Level of Contamination (Low/High/Unknown)	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTEX/TPH/PAHs/Phenols
21	BH2-1.0-09/09/13	9/10/13	PM	S	1	UR	X
22	BH2-2.0-09/09/13	9/10/13	PM	S	1	UR	X
23	BH2-2.5-09/09/13	9/10/13	PM	S	1	UR	X
24	BH2-0.5-09/09/13	9/10/13	PM	S	1	UR	X
25	BH2-1.0-09/09/13	9/10/13	PM	S	1	UR	X
26	BH2-1.0-09/09/13	9/10/13	PM	S	1	UR	X
27	WC01-10/10/13	10/10/13	am	S	1	UR	
28	WC02-10/10/13	10/10/13	am	S	1	UR	
SAMPLE MATRIX = Soil/Sediment/Sludge/Other		SAMPLE TYPE = Composite/Discrete/OC/Disinfectant/DS/Car/CR/Grab Sample/GS		HIGH CONCENTRATION: circle expected parameters in analysis file		SIGNATURE	
RELEASED BY		COMPANY		DATE		TIME	
RECEIVED BY		COMPANY		DATE		TIME	
RELEASED BY		COMPANY		DATE		TIME	
RECEIVED BY		COMPANY		DATE		TIME	

THIS FORM IS TO BE SIGNED BY GOLDER STAFF; COURIER/S; LABORATORY ON RECEIPT OF SAMPLES.

Wael Saleh

From: Loren Schiavon
Sent: Monday, 14 October 2013 9:13 AM
To: Wael Saleh
Subject: FW: Your Reference : 137623028. COC/SRN for ALSE Workorder : ES1322093
Attachments: ES1322093_COC.pdf; ES1322093_0_SRN_131011172616.pdf; 1801_001.pdf

Hi Wael,

Can you please look into this for me?

Thanks!

Kind Regards

Loren Schiavon
CLIENT SERVICES CO-ORDINATOR
ALS | Environmental Division
277-289 Woodpark Road
Smithfield NSW 2164 Australia

How was your customer experience? Please send us your feedback Please see our latest EnviroMail 68 - Sampling and Analysis Implications of the new NEPM - July 2013

EnviroMail 69 - Testing Requirements of the new NEPM - July 2013

EnviroMail 70 - Variation of Naphthalene by SVOC and VOC Methods in Water - July 2013

T +61 2 8784 8555
D +61 2 8784 8503
F +61 2 8784 8500

www.alsglobal.com

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

-----Original Message-----

From: Olmos, Carolina [mailto:COlmos@golder.com.au]
Sent: Sunday, 13 October 2013 8:47 PM
To: Loren Schiavon
Cc: Ye, Ke; Miller, Graeme
Subject: FW: Your Reference : 137623028. COC/SRN for ALSE Workorder : ES1322093

Hi Loren:

We received this COC and SRN for job number 137623028, I have checked the COC (updated version Ke sent it on Friday and attached to this email as 1801_001) and SRN, and there are some missing analysis as the following:

A) Sample BH04_0.4 (ALS#002) is missing Ammonia analysis.

B) Sample BH01_0.5 (ALS#025) even though in the updated is not marked, can you please analyse it for total metals?

Cheers,

Carolina.

Carolina Olmos (BEnv Eng) | Environmental Engineer | Golder Associates Pty Ltd
124 Pacific Highway, St. Leonards, New South Wales 2065, Australia (PO Box 1302, Crows Nest NSW 1585)
T: +61 2 9478 3900 | D: +61 2 9478 3900 (Working days Tuesdays - Wednesdays - Thursdays) | F: +61 2 9478 3901 |
M: 0433 564 447 | E: COlmos@golder.com.au | www.golder.com

Winner of 22 BRW Client Choice Awards 2006-2013, including in 2013:
Best Consulting Engineering Firm (revenue greater than \$200m)

Work Safe, Home Safe

This email transmission is confidential and may contain proprietary information for the exclusive use of the intended recipient. Any use, distribution or copying of this transmission, other than by the intended recipient, is strictly prohibited. If you are not the intended recipient, please notify the sender and delete all copies. Electronic media is susceptible to unauthorized modification, deterioration, and incompatibility. Accordingly, the electronic media version of any work product may not be relied upon. Any advice provided in or attached to this email is subject to limitations.

Golder, Golder Associates and the GA globe design are trademarks of Golder Associates Corporation.

Please consider the environment before printing this email.

-----Original Message-----

From: alse.sydney.aus@alsglobal.com [mailto:alse.sydney.aus@alsglobal.com]
Sent: Friday, 11 October 2013 5:29 PM
To: Olmos, Carolina
Subject: Your Reference : 137623028. COC/SRN for ALSE Workorder : ES1322093

This e-mail has been automatically generated.

-- PLEASE DO NOT REPLY --

ALS acknowledges the risks associated with supplying electronic media reports based on client requirements. This type of format has the ability to embed viruses within the code and, as such, ALS has introduced a three tier layer of protection throughout their company resources. However, ALS cannot guarantee any attachment is virus free and will not be held liable for any disruption to business. It is highly recommended that all attachments received are scanned prior to opening.

The information contained in this email is confidential. If the reader is not the intended recipient then you must notify the sender immediately by return email and then delete all copies of this email. You must not copy, distribute, print or otherwise use the information. Email may be stored by the Company to support operational activities. All information will be held in accordance with the Company's Privacy Policy which can be found on the Company's website - www.alsglobal.com.

Scanned By Websense

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: ES1316167	Page	: 1 of 9
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 17-JUL-2013
C-O-C number	: ----	Issue Date	: 24-JUL-2013
Sampler	: CO	No. of samples received	: 3
Site	: PHC-PRIMARY SCHOOL	No. of samples analysed	: 3
Quote number	: ----		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Alex Rossi	Organic Chemist	Sydney Organics
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics



General Comments

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

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

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

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

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

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

LOR = Limit of reporting

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

- EG051G:Spike failed for Ferrous Iron analysis due to matrix interference(confirmed by re analysis)



Analytical Results

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

Client sample ID

Client sampling date / time

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EA015: Total Dissolved Solids								
Total Dissolved Solids @180°C	----	10	mg/L	567	1860	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	20	9	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	20	9	----	----	----
ED038A: Acidity								
Acidity as CaCO3	----	1	mg/L	103	99	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	122	597	----	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	208	270	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	5	3	----	----	----
Magnesium	7439-95-4	1	mg/L	5	18	----	----	----
Sodium	7440-23-5	1	mg/L	189	682	----	----	----
Potassium	7440-09-7	1	mg/L	4	3	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	0.38	0.26	----	----	----
Arsenic	7440-38-2	0.001	mg/L	0.002	0.001	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0009	<0.0001	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	----
Cobalt	7440-48-4	0.001	mg/L	0.003	0.013	----	----	----
Copper	7440-50-8	0.001	mg/L	0.082	0.033	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.033	0.114	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.004	0.012	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.082	0.041	----	----	----
Iron	7439-89-6	0.05	mg/L	0.48	<0.05	----	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.004	0.005	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	0.0011	<0.0001	<0.0001	----	----



Analytical Results

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

Client sample ID

Client sampling date / time

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EG020T: Total Metals by ICP-MS - Continued								
Chromium	7440-47-3	0.001	mg/L	0.003	0.003	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	0.163	0.062	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	0.008	0.015	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	0.004	0.003	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	0.105	0.055	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	0.042	0.150	<0.001	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG051G: Ferrous Iron by Discrete Analyser								
Ferrous Iron	----	0.05	mg/L	0.45	<0.05	----	----	----
EG052G: Silica by Discrete Analyser								
Reactive Silica	----	0.10	mg/L	64.1	112	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	0.08	<0.01	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	----	0.01	mg/L	<0.01	<0.01	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	0.02	120	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.02	120	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	29.8	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	150	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.47	0.62	----	----	----
EN055: Ionic Balance								
Total Anions	----	0.01	meq/L	8.81	----	----	----	----
Total Anions	----	0.01	meq/L	----	28.8	----	----	----
Total Cations	----	0.01	meq/L	8.98	31.4	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EN055: Ionic Balance - Continued								
Ionic Balance	----	0.01	%	0.97	----	----	----	----
Ionic Balance	----	0.01	%	----	4.28	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	----	----	----
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	----	----	----
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	----	----	----
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	----	----	----
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	----	----	----
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	----	----	----
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	----	----	----
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	----	----	----
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	----	----	----
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----
4,4'-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	----	----	----
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	----	----	----
4,4'-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	----	----	----
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	----	----	----
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	----	----	----
4,4'-DDT	50-29-3	2.0	µg/L	<2.0	<2.0	----	----	----
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	----	----	----
Methoxychlor	72-43-5	2.0	µg/L	<2.0	<2.0	----	----	----
^ Total Chlordane (sum)	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Sum of DDD + DDE + DDT	----	0.5	µg/L	<0.5	<0.5	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.5	µg/L	<0.5	<0.5	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	----	----	----
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	----	----	----
Monocrotophos	6923-22-4	2.0	µg/L	<2.0	<2.0	----	----	----
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	----	----	----
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

Client sampling date / time

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EP068B: Organophosphorus Pesticides (OP) - Continued								
Parathion-methyl	298-00-0	2.0	µg/L	<2.0	<2.0	----	----	----
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	----	----	----
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	----	----	----
Parathion	56-38-2	2.0	µg/L	<2.0	<2.0	----	----	----
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	----	----	----
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	----	----	----
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	----	----	----
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	----	----	----
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	----	----	----
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	----	----	----
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	----	----	----
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0	----	----
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4,6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
2,4,5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)

Client sample ID

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
Client sampling date / time				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0	----	----
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
^ Benzo(a)pyrene TEQ (WHO)	----	0.5	µg/L	<0.5	<0.5	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	----	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	----	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	----	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	20	µg/L	<20	<20	<20	----	----
^ C6 - C10 Fraction minus BTEX (F1)	----	20	µg/L	<20	<20	<20	----	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	----	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	----	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	----	----



Analytical Results

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

Client sample ID

Client sampling date / time

				D1_17/07/13	D4_17/07/13	QC300_17/07/13	----	----
				17-JUL-2013 02:30	17-JUL-2013 03:30	17-JUL-2013 15:00	----	----
Compound	CAS Number	LOR	Unit	ES1316167-001	ES1316167-002	ES1316167-003	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	74.3	69.7	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	85.7	77.1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	24.2	24.4	27.5	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	56.9	55.8	59.4	----	----
2,4,6-Tribromophenol	118-79-6	0.1	%	62.5	61.4	68.2	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	64.8	68.7	68.0	----	----
Anthracene-d10	1719-06-8	0.1	%	64.8	68.6	69.2	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	64.2	62.4	64.6	----	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	104	103	105	----	----
Toluene-D8	2037-26-5	0.1	%	113	115	110	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	112	110	112	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	30	120
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	26.8	129
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	15.9	102
2,4,6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20.4	112
Anthracene-d10	1719-06-8	29.6	118
4-Terphenyl-d14	1718-51-0	21.5	126
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

Environmental Division

QUALITY CONTROL REPORT

Work Order	: ES1316167	Page	: 1 of 15
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: PHC-PRIMARY SCHOOL	Date Samples Received	: 17-JUL-2013
C-O-C number	: ----	Issue Date	: 24-JUL-2013
Sampler	: CO	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3
Quote number	: ----		

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

This Quality Control Report contains the following information:

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



NATA Accredited Laboratory 825

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
Alex Rossi	Organic Chemist	Sydney Organics
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics



General Comments

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

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

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

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

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

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 (%)
EA015: Total Dissolved Solids (QC Lot: 2972624)									
ES1316166-016	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	14000	14200	1.2	0% - 20%
ES1316166-024	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	5150	5140	0.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 2973103)									
ES1316166-027	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	616	622	1.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	616	622	1.0	0% - 20%
ES1316175-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	41	40	3.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	41	40	3.0	0% - 20%
ED038A: Acidity (QC Lot: 2974460)									
ES1316118-005	Anonymous	ED038: Acidity as CaCO3	----	1	mg/L	30	29	3.4	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2973198)									
ES1316103-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	36	35	0.0	0% - 20%
ES1316164-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	48	47	2.2	0% - 20%
ED045G: Chloride Discrete analyser (QC Lot: 2973197)									
ES1316103-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	30	30	0.0	0% - 20%
ES1316164-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	11	7	43.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 2973195)									
ES1316103-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1	1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	27	26	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	3	0.0	No Limit
ES1316176-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	4	4	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2976208)									
ES1316299-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	<0.001	78.8	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	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 (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2976208) - continued									
ES1316299-001	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.019	0.019	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.10	0.09	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.24	0.22	7.1	No Limit
ES1316299-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.002	0.002	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.018	0.018	0.0	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.10	0.11	0.0	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.24	0.24	0.0	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2976209)									
ES1316140-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.010	0.011	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
ES1316299-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.002	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.020	0.022	7.8	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.012	0.014	8.3	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2976416)									
ES1316116-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	Not Authorised	# Not Authorised	11.4	0% - 50%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 2976416) - continued									
ES1316116-002	Anonymous	EG020A-T: Chromium	7440-47-3	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	Not Authorised	# Not Authorised	4.8	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
ES1316130-004	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	Not Authorised	# Not Authorised	0.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	Not Authorised	# Not Authorised	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2976207)									
ES1316140-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2972659)									
EN1302615-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EG051G: Ferrous Iron by Discrete Analyser (QC Lot: 2974973)									
ES1316166-016	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	0.38	0.51	29.4	0% - 50%
ES1316166-029	Anonymous	EG051G: Ferrous Iron	----	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG052G: Silica by Discrete Analyser (QC Lot: 2973199)									
ES1316167-001	D1_17/07/13	EG052G: Reactive Silica	----	0.10	mg/L	64.1	64.6	0.8	0% - 20%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 2972761)									
ES1316102-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	27.2	27.4	1.0	0% - 20%
ES1316138-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	145	146	0.5	0% - 20%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2973196)									
ES1316103-001	Anonymous	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.01	0.0	No Limit
ES1316167-001	D1_17/07/13	EK057G: Nitrite as N	----	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 2972760)									
ES1316102-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	22.0	22.3	1.1	0% - 20%
ES1316138-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.0	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2971995)									
ES1316108-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	<0.5	0.0	No Limit
ES1316146-007	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.5	0.0	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2971997)									
ES1316146-008	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.05	<0.05	0.0	No Limit
EW1302087-002	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.03	<0.01	101	0% - 20%

Page : 6 of 15
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2973613)									
ES1316224-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QC Lot: 2973613)									
ES1316224-001	Anonymous	EP080: C6 - C10 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 2973613)									
ES1316224-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	0.0	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



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

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

Sub-Matrix: **WATER**

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
EA015: Total Dissolved Solids (QCLot: 2972624)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	293 mg/L	96.0	87	125
ED037P: Alkalinity by PC Titrator (QCLot: 2973103)								
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	----	200 mg/L	89.0	81	111
ED038A: Acidity (QCLot: 2974460)								
ED038: Acidity as CaCO3	----	1	mg/L	<1	20 mg/L	100	93	109
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973198)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	104	86	122
ED045G: Chloride Discrete analyser (QCLot: 2973197)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	1000 mg/L	93.3	77	123
ED093F: Dissolved Major Cations (QCLot: 2973195)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	87	113
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	89	113
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	88.4	79	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.0	87	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2976208)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	80	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	109	80	118
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.2	82	112
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	81	111
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.6	81	113
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.5	80	112
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	83	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	93.6	81	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	81	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	105	73	125
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	80	116
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	77	115
EG020T: Total Metals by ICP-MS (QCLot: 2976209)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.9	82	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	89.7	83	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.5	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.4	85	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	92.6	83	115



Sub-Matrix: **WATER**

Method: Compound				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
						LCS	Low	High
CAS Number	LOR	Unit						
EG020T: Total Metals by ICP-MS (QCLot: 2976209) - continued								
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	91.7	83	117
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.1	68	128
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.1	76	118
EG020T: Total Metals by ICP-MS (QCLot: 2976416)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	118	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	82	114
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.2	83	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	108	85	115
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	83	115
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.6	83	117
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	109	68	128
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	76	118
EG035F: Dissolved Mercury by FIMS (QCLot: 2976207)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	89.4	78	114
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972659)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	95.1	77	115
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2974973)								
EG051G: Ferrous Iron	----	0.10	mg/L	<0.10	2.00 mg/L	99.7	89	113
EG052G: Silica by Discrete Analyser (QCLot: 2973199)								
EG052G: Reactive Silica	----	0.1	mg/L	<0.10	5 mg/L	105	94	114
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2972761)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1.00 mg/L	109	86	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973196)								
EK057G: Nitrite as N	----	0.01	mg/L	<0.01	0.5 mg/L	102	83	119
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2972760)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	101	87	119
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2971995)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	5 mg/L	81.9	66	126
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2971997)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	91.5	67	124
EP068A: Organochlorine Pesticides (OC) (QCLot: 2972180)								
EP068: alpha-BHC	319-84-6	0.5	µg/L	<0.5	5 µg/L	96.7	61	117
EP068: Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	5 µg/L	98.0	56	116
EP068: beta-BHC	319-85-7	0.5	µg/L	<0.5	5 µg/L	84.7	60	118
EP068: gamma-BHC	58-89-9	0.5	µg/L	<0.5	5 µg/L	93.7	62	118
EP068: delta-BHC	319-86-8	0.5	µg/L	<0.5	5 µg/L	83.5	64	116

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	High
EP068A: Organochlorine Pesticides (OC) (QCLot: 2972180) - continued								
EP068: Heptachlor	76-44-8	0.5	µg/L	<0.5	5 µg/L	91.2	63	117
EP068: Aldrin	309-00-2	0.5	µg/L	<0.5	5 µg/L	91.7	65	121
EP068: Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	5 µg/L	80.9	63	117
EP068: trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	5 µg/L	84.4	64	120
EP068: alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	5 µg/L	94.6	67	119
EP068: cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	5 µg/L	82.5	63	123
EP068: Dieldrin	60-57-1	0.5	µg/L	<0.5	5 µg/L	79.9	64	122
EP068: 4,4'-DDE	72-55-9	0.5	µg/L	<0.5	5 µg/L	87.2	64	118
EP068: Endrin	72-20-8	0.5	µg/L	<0.5	5 µg/L	94.1	64	126
EP068: beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	5 µg/L	93.7	68	122
EP068: 4,4'-DDD	72-54-8	0.5	µg/L	<0.5	5 µg/L	89.2	66	122
EP068: Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	5 µg/L	101	62	112
EP068: Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	5 µg/L	84.0	60	124
EP068: 4,4'-DDT	50-29-3	2.0	µg/L	<2.0	5 µg/L	98.2	54	126
EP068: Endrin ketone	53494-70-5	0.5	µg/L	<0.5	5 µg/L	81.3	55	119
EP068: Methoxychlor	72-43-5	2.0	µg/L	<2.0	5 µg/L	106	53	127
EP068B: Organophosphorus Pesticides (OP) (QCLot: 2972180)								
EP068: Dichlorvos	62-73-7	0.5	µg/L	<0.5	5 µg/L	77.5	52	128
EP068: Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	5 µg/L	78.4	28.4	150
EP068: Monocrotophos	6923-22-4	0.5	µg/L	----	5 µg/L	27.1	10	89.1
		2.0	µg/L	<2.0	----	----	----	----
EP068: Dimethoate	60-51-5	0.5	µg/L	<0.5	5 µg/L	76.6	61	117
EP068: Diazinon	333-41-5	0.5	µg/L	<0.5	5 µg/L	89.0	64	122
EP068: Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	5 µg/L	96.5	67	121
EP068: Parathion-methyl	298-00-0	2.0	µg/L	<2.0	5 µg/L	101	59	123
EP068: Malathion	121-75-5	0.5	µg/L	<0.5	5 µg/L	90.1	57	123
EP068: Fenthion	55-38-9	0.5	µg/L	<0.5	5 µg/L	82.7	67	119
EP068: Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	5 µg/L	83.0	67	121
EP068: Parathion	56-38-2	2.0	µg/L	<2.0	5 µg/L	102	64	118
EP068: Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	5 µg/L	83.6	64	118
EP068: Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	5 µg/L	87.4	59	123
EP068: Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	5 µg/L	82.6	62	122
EP068: Fenamiphos	22224-92-6	0.5	µg/L	<0.5	5 µg/L	85.6	59	131
EP068: Prothiofos	34643-46-4	0.5	µg/L	<0.5	5 µg/L	87.2	64	116
EP068: Ethion	563-12-2	0.5	µg/L	<0.5	5 µg/L	88.9	68	120
EP068: Carbophenothion	786-19-6	0.5	µg/L	<0.5	5 µg/L	89.3	62	120
EP068: Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	5 µg/L	82.3	39	131
EP075(SIM)A: Phenolic Compounds (QCLot: 2972179)								



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)A: Phenolic Compounds (QCLot: 2972179) - continued								
EP075(SIM): Phenol	108-95-2	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	47.0 ----	24.5 ----	61.9 ----
EP075(SIM): 2-Chlorophenol	95-57-8	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	65.1 ----	63.8 ----	110 ----
EP075(SIM): 2-Methylphenol	95-48-7	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	65.4 ----	55.9 ----	112 ----
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4 2	µg/L µg/L	---- <2.0	10 µg/L ----	61.5 ----	42.5 ----	114 ----
EP075(SIM): 2-Nitrophenol	88-75-5	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	66.1 ----	62.7 ----	117 ----
EP075(SIM): 2,4-Dimethylphenol	105-67-9	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	78.3 ----	59.9 ----	112 ----
EP075(SIM): 2,4-Dichlorophenol	120-83-2	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	71.0 ----	59.3 ----	122 ----
EP075(SIM): 2,6-Dichlorophenol	87-65-0	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	73.6 ----	64.3 ----	118 ----
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	83.1 ----	63 ----	119 ----
EP075(SIM): 2,4,6-Trichlorophenol	88-06-2	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	81.5 ----	58.7 ----	118 ----
EP075(SIM): 2,4,5-Trichlorophenol	95-95-4	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	87.6 ----	51.2 ----	118 ----
EP075(SIM): Pentachlorophenol	87-86-5	0.4 2	µg/L µg/L	---- <2.0	10 µg/L ----	57.6 ----	6.85 ----	95.6 ----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2972179)								
EP075(SIM): Naphthalene	91-20-3	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	65.8 ----	58.6 ----	119 ----
EP075(SIM): Acenaphthylene	208-96-8	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	79.4 ----	63.6 ----	114 ----
EP075(SIM): Acenaphthene	83-32-9	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	74.8 ----	62.2 ----	113 ----
EP075(SIM): Fluorene	86-73-7	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	83.2 ----	63.9 ----	115 ----
EP075(SIM): Phenanthrene	85-01-8	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	83.7 ----	62.6 ----	116 ----
EP075(SIM): Anthracene	120-12-7	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	83.0 ----	64.3 ----	116 ----
EP075(SIM): Fluoranthene	206-44-0	0.2 1	µg/L µg/L	---- <1.0	5 µg/L ----	94.5 ----	63.6 ----	118 ----



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: 2972179) - continued								
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	----	5 µg/L	93.4	63.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	----	5 µg/L	90.8	64.1	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	----	5 µg/L	89.0	62.5	116
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(b)fluoranthene	205-99-2	0.2	µg/L	----	5 µg/L	90.8	61.7	119
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	----	5 µg/L	90.5	61.7	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	----	5 µg/L	90.4	63.3	117
		0.5	µg/L	<0.5	----	----	----	----
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	----	5 µg/L	89.0	59.9	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Dibenzo(a,h)anthracene	53-70-3	0.2	µg/L	----	5 µg/L	89.7	61.2	117
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.2	µg/L	----	5 µg/L	88.7	59.1	118
		1	µg/L	<1.0	----	----	----	----
EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	1	µg/L	<1.0	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2972181)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	96.0	58.9	131
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	101	73.9	138
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	101	62.7	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2973613)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	95.4	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2972181)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	82.3	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	93.7	73.9	138
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
		50	µg/L	----	1500 µg/L	97.7	62.7	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2973613)								
EP080: C6 - C10 Fraction	----	20	µg/L	<20	310 µg/L	97.6	75	127
EP080: BTEXN (QCLot: 2973613)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	103	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	101	66	132
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.6	70	120
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	106	69	121
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	108	72	122

Page : 12 of 15
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



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				
EP080: BTEXN (QCLot: 2973613) - continued								
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	104	70	124

Matrix Spike (MS) Report

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

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973198)							
ES1316103-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	98.9	70	130
ED045G: Chloride Discrete analyser (QCLot: 2973197)							
ES1316103-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	102	70	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2976208)							
ES1316299-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	84.7	70	130
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	70	130
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	105	70	130
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	107	70	130
		EG020A-F: Copper	7440-50-8	0.2 mg/L	105	70	130
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	70	130
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	102	70	130
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	107	70	130
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	108	70	130
EG020T: Total Metals by ICP-MS (QCLot: 2976209)							
ES1316140-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	80.8	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	110	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	99.2	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	100	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	99.7	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.8	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.0	70	130
EG020T: Total Metals by ICP-MS (QCLot: 2976416)							
ES1316118-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	88.7	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	107	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	90.1	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	107	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	103	70	130

Page : 13 of 15
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



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: 2976416) - continued							
ES1316118-001	Anonymous	EG020A-T: Manganese	7439-96-5	1 mg/L	108	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	94.9	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	98.6	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2976207)							
ES1316140-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	86.7	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972659)							
ES1316167-003	QC300_17/07/13	EG035T: Mercury	7439-97-6	0.010 mg/L	72.5	70	130
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2974973)							
ES1316166-016	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# 26.7	68	128
EG052G: Silica by Discrete Analyser (QCLot: 2973199)							
ES1316167-001	D1_17/07/13	EG052G: Reactive Silica	----	5.0 mg/L	# Not Determined	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2972761)							
ES1316102-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	# Not Determined	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973196)							
ES1316103-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	101	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2972760)							
ES1316102-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2971995)							
ES1316108-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	85.0	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2971997)							
ES1316146-008	Anonymous	EK067G: Total Phosphorus as P	----	5 mg/L	95.2	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2973613)							
ES1316224-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	108	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2973613)							
ES1316224-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	107	70	130
EP080: BTEXN (QCLot: 2973613)							
ES1316224-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	119	70	130
		EP080: Toluene	108-88-3	25 µg/L	118	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	126	70	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	122	70	130
		EP080: ortho-Xylene	106-42-3	25 µg/L	121	70	130

Page : 14 of 15
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID		Client sample ID	Method: Compound	CAS Number	Spike Concentration	Spike Recovery(%) MS	Recovery Limits (%) Low High
EP080: BTEXN (QCLot: 2973613) - continued							
ES1316224-001	Anonymous	EP080: Naphthalene	91-20-3	25 µg/L	118	70	130

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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number		MS	MSD	Low	High	Value	Control Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2971995)										
ES1316108-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	85.0	----	70	130	----	----
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2971997)										
ES1316146-008	Anonymous	EK067G: Total Phosphorus as P	----	5 mg/L	95.2	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972659)										
ES1316167-003	QC300_17/07/13	EG035T: Mercury	7439-97-6	0.010 mg/L	72.5	----	70	130	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2972760)										
ES1316102-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	# Not Determined	----	70	130	----	----
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2972761)										
ES1316102-001	Anonymous	EK055G: Ammonia as N	7664-41-7	1.00 mg/L	# Not Determined	----	70	130	----	----
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973196)										
ES1316103-001	Anonymous	EK057G: Nitrite as N	----	0.5 mg/L	101	----	70	130	----	----
ED045G: Chloride Discrete analyser (QCLot: 2973197)										
ES1316103-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	102	----	70	130	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973198)										
ES1316103-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	98.9	----	70	130	----	----
EG052G: Silica by Discrete Analyser (QCLot: 2973199)										
ES1316167-001	D1_17/07/13	EG052G: Reactive Silica	----	5.0 mg/L	# Not Determined	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2973613)										
ES1316224-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	108	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft (QCLot: 2973613)										
ES1316224-001	Anonymous	EP080: C6 - C10 Fraction	----	375 µg/L	107	----	70	130	----	----
EP080: BTEXN (QCLot: 2973613)										
ES1316224-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	119	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	118	----	70	130	----	----



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike Concentration	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
					MS	MSD	Low	High	Value	Control Limit
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number							
EP080: BTEXN (QCLot: 2973613) - continued										
ES1316224-001	Anonymous	EP080: Ethylbenzene	100-41-4	25 µg/L	126	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	122	----	70	130	----	----
		106-42-3								
		EP080: ortho-Xylene	95-47-6	25 µg/L	121	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	118	----	70	130	----	----
EG051G: Ferrous Iron by Discrete Analyser (QCLot: 2974973)										
ES1316166-016	Anonymous	EG051G: Ferrous Iron	----	1.00 mg/L	# 26.7	----	68	128	----	----
EG035F: Dissolved Mercury by FIMS (QCLot: 2976207)										
ES1316140-002	Anonymous	EG035F: Mercury	7439-97-6	0.0100 mg/L	86.7	----	70	130	----	----
EG020F: Dissolved Metals by ICP-MS (QCLot: 2976208)										
ES1316299-002	Anonymous	EG020A-F: Arsenic	7440-38-2	0.2 mg/L	84.7	----	70	130	----	----
		EG020A-F: Cadmium	7440-43-9	0.05 mg/L	105	----	70	130	----	----
		EG020A-F: Chromium	7440-47-3	0.2 mg/L	105	----	70	130	----	----
		EG020A-F: Cobalt	7440-48-4	0.2 mg/L	107	----	70	130	----	----
		EG020A-F: Copper	7440-50-8	0.2 mg/L	105	----	70	130	----	----
		EG020A-F: Lead	7439-92-1	0.2 mg/L	102	----	70	130	----	----
		EG020A-F: Manganese	7439-96-5	0.2 mg/L	102	----	70	130	----	----
		EG020A-F: Nickel	7440-02-0	0.2 mg/L	107	----	70	130	----	----
		EG020A-F: Zinc	7440-66-6	0.2 mg/L	108	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 2976209)										
ES1316140-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	80.8	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	104	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	110	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1 mg/L	99.2	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	100	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1 mg/L	99.7	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.8	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.0	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 2976416)										
ES1316118-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	88.7	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	107	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	90.1	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1 mg/L	107	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	103	----	70	130	----	----
		EG020A-T: Manganese	7439-96-5	1 mg/L	108	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	94.9	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	98.6	----	70	130	----	----

Environmental Division

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: ES1316167	Page	: 1 of 10
Client	: PORT KEMBLA COPPER	Laboratory	: Environmental Division Sydney
Contact	: MS CAROLINA OLMOS	Contact	: Client Services
Address	: SYDNEY	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: colmos@golder.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 137623028	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: PHC-PRIMARY SCHOOL	Date Samples Received	: 17-JUL-2013
C-O-C number	: ----	Issue Date	: 24-JUL-2013
Sampler	: CO	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3
Quote number	: ----		

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

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers



Analysis Holding Time Compliance

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and precludes subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the analysis aliquot was taken. Elapsed period to analysis represents number of days from sampling where no extraction / digestion is involved or period from extraction / digestion where this is present. For composite samples, sampling date is assumed to be that of the oldest sample contributing to the composite. Sample date for laboratory produced leachates is assumed as the completion date of the leaching process. Outliers for holding time are based on USEPA SW 846, APHA, AS and NEPM (1999). A listing of breaches is provided in the Summary of Outliers.

Holding times for leachate methods (excluding elutriates) vary according to the analytes being determined on the resulting solution. For non-volatile analytes, the holding time compliance assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These soil holding times are: Organics (14 days); Mercury (28 days) & other metals (180 days). A recorded breach therefore does not guarantee a breach for all non-volatile parameters.

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

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA015: Total Dissolved Solids								
Clear Plastic Bottle - Natural (EA015H) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	24-JUL-2013	----	18-JUL-2013	24-JUL-2013	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	31-JUL-2013	----	18-JUL-2013	31-JUL-2013	✓
ED038A: Acidity								
Clear Plastic Bottle - Natural (ED038) D1_17/07/13,	D4_17/07/13	17-JUL-2013	----	----	----	19-JUL-2013	31-JUL-2013	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	18-JUL-2013	14-AUG-2013	✓
ED045G: Chloride Discrete analyser								
Clear Plastic Bottle - Natural (ED045G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	18-JUL-2013	14-AUG-2013	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	24-JUL-2013	----	18-JUL-2013	24-JUL-2013	✓
EG020F: Dissolved Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	13-JAN-2014	----	20-JUL-2013	13-JAN-2014	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) D1_17/07/13,	D4_17/07/13	17-JUL-2013	20-JUL-2013	13-JAN-2014	✓	20-JUL-2013	13-JAN-2014	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) QC300_17/07/13		17-JUL-2013	22-JUL-2013	13-JAN-2014	✓	22-JUL-2013	13-JAN-2014	✓
EG035F: Dissolved Mercury by FIMS								
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	22-JUL-2013	14-AUG-2013	✓

Page : 3 of 10
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



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) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	----	----	----	18-JUL-2013	14-AUG-2013	✓
EG051G: Ferrous Iron by Discrete Analyser								
Clear Plastic Bottle - HCl - Filtered (EG051G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	----	----	----	19-JUL-2013	24-JUL-2013	✓
EG052G: Silica by Discrete Analyser								
Clear Plastic Bottle - Natural (EG052G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	18-JUL-2013	14-AUG-2013	✓
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	18-JUL-2013	14-AUG-2013	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	19-JUL-2013	----	18-JUL-2013	19-JUL-2013	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	---	14-AUG-2013	----	18-JUL-2013	14-AUG-2013	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	18-JUL-2013	14-AUG-2013	✓	18-JUL-2013	14-AUG-2013	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G) D1_17/07/13,	D4_17/07/13	17-JUL-2013	18-JUL-2013	14-AUG-2013	✓	18-JUL-2013	14-AUG-2013	✓
EP068A: Organochlorine Pesticides (OC)								
Amber Glass Bottle - Unpreserved (EP068) D1_17/07/13,	D4_17/07/13	17-JUL-2013	18-JUL-2013	24-JUL-2013	✓	19-JUL-2013	27-AUG-2013	✓
EP068B: Organophosphorus Pesticides (OP)								
Amber Glass Bottle - Unpreserved (EP068) D1_17/07/13,	D4_17/07/13	17-JUL-2013	18-JUL-2013	24-JUL-2013	✓	19-JUL-2013	27-AUG-2013	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber Glass Bottle - Unpreserved (EP071) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	18-JUL-2013	24-JUL-2013	✓	19-JUL-2013	27-AUG-2013	✓
EP075(SIM)A: Phenolic Compounds								
Amber Glass Bottle - Unpreserved (EP075(SIM)) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	18-JUL-2013	24-JUL-2013	✓	19-JUL-2013	27-AUG-2013	✓

Page : 4 of 10
 Work Order : ES1316167
 Client : PORT KEMBLA COPPER
 Project : 137623028



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)) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	18-JUL-2013	24-JUL-2013	✓	19-JUL-2013	27-AUG-2013	✓
EP080: BTEXN								
Amber VOC Vial - Sulfuric Acid (EP080) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	18-JUL-2013	31-JUL-2013	✓	18-JUL-2013	31-JUL-2013	✓
EP080/071: Total Petroleum Hydrocarbons								
Amber VOC Vial - Sulfuric Acid (EP080) D1_17/07/13, QC300_17/07/13	D4_17/07/13,	17-JUL-2013	18-JUL-2013	31-JUL-2013	✓	18-JUL-2013	31-JUL-2013	✓



Quality Control Parameter Frequency Compliance

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

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Acidity as Calcium Carbonate	ED038	1	3	33.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Alkalinity by PC Titrator	ED037-P	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Silica (Reactive) by Discrete Analyser	EG052G	1	2	50.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	19	10.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	4	39	10.3	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	2	16	12.5	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
Acidity as Calcium Carbonate	ED038	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Alkalinity by PC Titrator	ED037-P	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Silica (Reactive) by Discrete Analyser	EG052G	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	2	20	10.0	10.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	3	19	15.8	15.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS) - Continued							
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	3	16	18.8	15.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
Acidity as Calcium Carbonate	ED038	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Major Cations - Dissolved	ED093F	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Pesticides by GCMS	EP068	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Silica (Reactive) by Discrete Analyser	EG052G	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Dissolved Solids (High Level)	EA015H	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH - Semivolatile Fraction	EP071	1	3	33.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Chloride by Discrete Analyser	ED045G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Mercury by FIMS	EG035F	1	8	12.5	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Ferrous Iron by Discrete Analyser	EG051G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Nitrite as N by Discrete Analyser	EK057G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Silica (Reactive) by Discrete Analyser	EG052G	1	2	50.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.0	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	5.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	2	39	5.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Phosphorus as P By Discrete Analyser	EK067G	1	16	6.3	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TPH Volatiles/BTEX	EP080	1	9	11.1	5.0	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement



Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Total Dissolved Solids (High Level)	EA015H	WATER	In-House, APHA 21st ed., 2540C A gravimetric procedure that determines the amount of 'filterable' residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Alkalinity by PC Titrator	ED037-P	WATER	APHA 21st ed., 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Acidity as Calcium Carbonate	ED038	WATER	APHA 21st ed., 2310 B Acidity is determined by titration with a standardised alkali to an end-point pH of 8.3. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	APHA 21st ed., 4500-SO4 Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Chloride by Discrete Analyser	ED045G	WATER	APHA 21st ed., 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	Major Cations is determined based on APHA 21st ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises the 0.45um filtered sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2) Hardness parameters are calculated based on APHA 21st ed., 2340 B. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): Samples are 0.45 um filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	(APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.



Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Mercury by FIMS	EG035F	WATER	AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) Samples are 0.45 um filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by 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 (1999) Schedule B(3) (Appdx. 2)
Total Mercury by FIMS	EG035T	WATER	AS 3550, APHA 21st ed. 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 (1999) Schedule B(3) (Appdx. 2)
Ferrous Iron by Discrete Analyser	EG051G	WATER	APHA 21st ed., 3500 Fe-B. A colorimetric determination based on the reaction between phenanthroline and ferrous iron at pH 3.2-3.3 to form an orange-red complex that is measured against a five-point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Silica (Reactive) by Discrete Analyser	EG052G	WATER	APHA 21st ed. 4500-SiO ₂ D: Under Acidic conditions reactive silicon combines with ammonium molybdate to form a yellow molybdosilicic acid complex. This is reduced by 1-amino-2-naphthol-4-sulfonic acid to a silicomolybdenum blue complex which is measured by discrete analyser at 670 nm. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ammonia as N by Discrete analyser	EK055G	WATER	APHA 21st ed., 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite as N by Discrete Analyser	EK057G	WATER	APHA 21st ed., 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrate as N by Discrete Analyser	EK058G	WATER	APHA 21st ed., 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	APHA 21st ed., 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	APHA 21st ed., 4500-Norg D. 25mL water samples are digested using a traditional Kjeldahl digestion followed by determination by Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	APHA 21st ed., 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	APHA 21st ed., 4500-P B&F This procedure involves sulphuric acid digestion of a 100mL sample to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using Discrete Analyser. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	APHA 21st Ed. 1030F. The Ionic Balance is calculated based on the major Anions and Cations. The major anions include Alkalinity, Chloride and Sulfate which determined by PCT and DA. The Cations are determined by Turbi SO ₄ by DA. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)



<i>Analytical Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Pesticides by GCMS	EP068	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
TPH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
<i>Preparation Methods</i>	<i>Method</i>	<i>Matrix</i>	<i>Method Descriptions</i>
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.



Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG051G: Ferrous Iron by Discrete Analyser	ES1316166-016	Anonymous	Ferrous Iron	----	26.7 %	68-128%	Recovery less than lower data quality objective
EG052G: Silica by Discrete Analyser	ES1316167-001	D1_17/07/13	Reactive Silica	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EK055G: Ammonia as N by Discrete Analyser	ES1316102-001	Anonymous	Ammonia as N	7664-41-7	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Ar	ES1316102-001	Anonymous	Nitrite + Nitrate as N	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

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

Regular Sample Surrogates

- For all regular sample matrices, no surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

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

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

- No Quality Control Sample Frequency Outliers exist.

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **ES1316167**

Client : **PORT KEMBLA COPPER**
Contact : **MS CAROLINA OLMOS**
Address : **SYDNEY**

Laboratory : Environmental Division Sydney
Contact : Client Services
Address : 277-289 Woodpark Road Smithfield
NSW Australia 2164

E-mail : colmos@golder.com.au
Telephone : ----
Facsimile : ----

E-mail : sydney@alsglobal.com
Telephone : +61-2-8784 8555
Facsimile : +61-2-8784 8500

Project : 137623028
Order number : ----
C-O-C number : ----
Site : **PHC-PRIMARY SCHOOL**
Sampler : **CO**

Page : 1 of 3

Quote number : ----

QC Level : NEPM 1999 Schedule B(3) and ALS
QCS3 requirement

Dates

Date Samples Received : 17-JUL-2013
Client Requested Due Date : 24-JUL-2013

Issue Date : 18-JUL-2013 12:46
Scheduled Reporting Date : **24-JUL-2013**

Delivery Details

Mode of Delivery : Carrier
No. of coolers/boxes : 1 HARD
Security Seal : Not intact.

Temperature : 5.2'C - Ice present
No. of samples received : 3
No. of samples analysed : 3

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.



Sample Container(s)/Preservation Non-Compliances

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

- No sample container / preservation non-compliance exist.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - EA019H Total Dissolved Solids - High Level	WATER - ED038 CaCO3 Acidity as CaCO3 only	WATER - EG020F Dissolved Metals by ICPMS	WATER - EG020T Total Recoverable Metals by ICPMS (including Ferrous Iron by Discrete Analyser)	WATER - EG051G Silica by Discrete Analyser	WATER - EG052G Ionic Balance by ED037P, ED041G, ED045G & Major Cations (Ca, Mg, Na, K)
ES1316167-001	17-JUL-2013 02:30	D1_17/07/13	✓	✓	✓	✓	✓	✓
ES1316167-002	17-JUL-2013 03:30	D4_17/07/13	✓	✓	✓	✓	✓	✓
ES1316167-003	17-JUL-2013 15:00	QC300_17/07/13				✓		

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)	WATER - NT-08 Total Nitrogen + NO2 + NO3 + NH3 + Total P	WATER - W-02T 8 metals (Total)	WATER - W-12 OC/OP Pesticides	WATER - W-27 TPH/BTEX/PAH/Phenols/8 Metals	WATER - W-27T TPH/BTEX/PAH/Phenols/Total 8 Metals
ES1316167-001	17-JUL-2013 02:30	D1_17/07/13	✓	✓	✓	✓	✓	
ES1316167-002	17-JUL-2013 03:30	D4_17/07/13	✓	✓	✓	✓	✓	
ES1316167-003	17-JUL-2013 15:00	QC300_17/07/13						✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.



Requested Deliverables

MR GRAEME MILLER

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

MR JIM BAILEY

- A4 - AU Tax Invoice (INV)	Email	Jim.bailey@pkc.com.au

MS CAROLINA OLMOS

- *AU Certificate of Analysis - NATA (COA)	Email	colmos@golder.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	colmos@golder.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	colmos@golder.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN	Email	colmos@golder.com.au
- Chain of Custody (CoC) (COC)	Email	colmos@golder.com.au
- EDI Format - ENMRG (ENMRG)	Email	colmos@golder.com.au
- EDI Format - EQUIS V5 Generic (EQUIS_V5)	Email	colmos@golder.com.au
- EDI Format - ESDAT (ESDAT)	Email	colmos@golder.com.au
- EDI Format - GOLDER_EXCEL (GOLDER_EXCEL)	Email	colmos@golder.com.au

MS MELINDA HALE

- A4 - AU Tax Invoice (INV)	Email	Melinda.hale@pkc.com.au

SAMPLE CHAIN OF CUSTODY DOCUMENTATION

Sheet 1 of 1

Project No: 137623028 Site Location: PKC - Primary School Sample ID: Carolina Olmos		ALS SY - 493 - 13		GOLDER ASSOCIATES PTY LTD 124 Pacific Highway, Greenwich Project Manager: Carolina Olmos Job Contact: Carolina Olmos		Phone: (02) 9478 3900 Fax: (02) 9478 3901 Receives: 0433 564 447 Email: Colmos@golder.com.au											
24hrs ☐ 48hrs ☐ Standard ☒ 36hrs ☐ 5 Days ☐ Date Required By:		EMAIL ☐ ESDAT ☐ BULLETIN BOARD ☐ EQUIS ☐		PDF ☐ EXCEL ☐		ANALYSIS REQUIRED											
Connecta Special Instructions: Please email report to colmos@golder.com.au and grmiller@golder.com.au																	
LAB ID	SAMPLE ID	SAMPLE DATE	SAMPLE TIME	SAMPLE MATRIX	Level of Contamination (Low/High/Unknown)	No CONTAINERS	Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Mn, Se, Hg)	BTXN/TRHS	PAHs and Phenols	Ammonia As N	Total N +TKN+NO2+NO3+NH3+Total Phosphorus	OCs/OPs	Disolved Metals (As, Al, Cd, Pb, Hg, Ni, Fe, Zn)	Ferrous Iron	Metals-Volatilized	TDS, major anions and cations, acidity/alkalinity, nitrate	Silica Reactive
1	01-17-07-13	17/07/13	2:30	W	C	5	X	X	X	X	X	X	X	X	X	X	X
2	04-17-07-13	17/07/13	3:30	W	C	5	X	X	X	X	X	X	X	X	X	X	X
3	06300-17-07-13	17/07/13	-	W	C	5	X	X	X	X	X	X	X	X	X	X	X
Environmental Division Sydney Work Order ES1316167 Telephone : + 61-2-8784 8555																	
SAMPLE TYPE = Composite (C) / Direct (DC) / Disturbed (DS) / Core (CR) / Grab Sample (GS)																	
SIGNATURE		COMPANY	DATE	TIME	SIGNATURE		COMPANY	DATE	TIME	SIGNATURE		COMPANY	DATE	TIME	SIGNATURE		COMPANY
RELEASED BY		Ranb		ARC		17-7-13		1840		USE DOCUMENT		USE DOCUMENT		USE DOCUMENT		USE DOCUMENT	
RECEIVED BY																	
RELEASED BY																	
RECEIVED BY																	

THIS FORM IS TO BE SIGNED BY GOLDER STAFF, COURIER/S, LABORATORY ON RECEIPT OF SAMPLES.



TABLE 4: DATA VALIDATION SUMMARY SHEET

Project Name:	PKC - Phase II Primary School	Project Number:	137623028	
Primary Laboratory:	ALS	Workorder Number:	ES1316167	
Secondary Laboratory:	N/A	Workorder Number:	N/A	
Date Sampled:	17/07/2013	Sample Medium:	Water	
Sample Information				
Number of Primary Samples:	2	Number of Triplicate Samples:	0	
Number of Duplicate Samples:	0	Number of Other QAQC Samples:	1	
Documentation and Sample Handling Information				
	Y/N	Comments		
COC completed properly?	Y	Signed by both field scientists and laboratory personnel.		
All requested analysis completed?	Y	All.		
Samples received intact and chilled?	Y	5.2°C - Ice present		
Samples analysed within appropriate holding times?	Y			
Sample volumes sufficient for QC analysis?	Y			
Are there non-NATA accredited methods used?	N			
Chromatograms supplied as appropriate?	N/A			
Laboratory reports signed by authorised personnel?	Y	All.		
QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)				
Type	Sample ID	Comments		
Method Blank	MB	All results were less than LORs.		
Rinsate Blank	QC300_17/07/13	All results were less than LORs.		
Trip Spike Information				
Analyte	Spike Concentrations	Recovery Concentration	% Recovery	Comments
N/A	N/A	N/A	N/A	No trip spike was prepared for this batch.
Laboratory Control Spike (LCS) Analyses				
Analyte Group	Comments			
Total Dissolved Solids, Alkalinity, Acidity, Major Anions, Major Cations, Dissolved Metals, Total Metals, Mercury, Ferrous Iron, Ammonia as N, Total Kjeldahl Nitrogen, Total Phosphorus as P, TRH, TPH and BTEXN	All LCS recoveries from ALS were within the laboratory control limits.			
Matrix Spike (MS) Analyses				
Analyte Group	Comments			
Ferrous Iron	MS recovery of ferrous iron (26.7%) in anonymous sample was less than lower data quality objective (68%).			
Reactive Silica	MS recovery of reactive silica in sample D1_17/07/13 was not determined.			
Ammonia as N	MS recovery of Ammonia as N in anonymous sample was not determined.			
Nitrite plus Nitrate as N (NOx)	MS recovery of Nitrite + Nitrate as N in anonymous sample was not determined.			
Laboratory Duplicates (LD) Analyses				
Analyte Group	Sample ID	Comments		
Total Dissolved Solids, Alkalinity, Acidity, Major Anions, Major Cations, Dissolved Metals, Total Metals, Mercury, Ferrous Iron, Ammonia as N, Total Kjeldahl Nitrogen, Total Phosphorus as P, TRH, TPH and BTEXN	Anonymous	All LD recoveries were below LOR.		
Nitrite as N and Reactive Silica	D1_17/07/13 and anonymous	All LD recoveries were below LOR.		
Field Duplicates (FD) Analyses				
Analyte Group	Primary ID	Duplicate ID	Comments	
			No Field Duplicates were taken for this batch.	
Field Triplicates (FT) Analyses				
Analyte Group	Primary ID	Triplicate ID	Comments	
			No Field Triplicates were taken for this batch.	
Surrogate Compound Monitoring Analyses				
Analyte Group	Analyte(s)	Comments		
		All surrogate recoveries were within acceptable recovery limits.		
Overall Comments				
As stated by ALS: Spike failed for Ferrous Iron analysis due to matrix interference (confirmed by re analysis)				
Matrix Spike recovery for Ammonia as N, Nitrite plus Nitrate as N (NOx) and reactive silica were not determined due to background level greater than or equal to four times spike level.				
No duplicate or triplicate samples were collected due to QC program proposed in the Golder (2013) SAQP was reduced.				
This batch has been validated and is considered suitable for environmental interpretive use.				

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By: Olga Bukhteeva
Date: 25/07/2013Checked By: Carolina Olmos
Date: 25/07/2013



DATA VALIDATION SUMMARY SHEET (Sydney)

Project Name:		PKC - Phase II Primary School Port Kembla		Project Number:		137623028	
Primary Laboratory:		ALS		Workorder Number:		EW1301886	
Secondary Laboratory:		Envirolab		Workorder Number:		93198	
Date Sampled:		25/06/2013 - 27/06/2013		Sample Medium:		Soil	

Sample Information			
Number of Primary Samples:		55	
Number of Duplicate Samples:		3	
Number of Triplicate Samples:		3	
Number of Other QAQC Samples:		6	

Documentation and Sample Handling Information			
	Y/N	Comments	
COC completed properly?	Y	Signed for field scientist and laboratory personnel.	
All requested analysis completed?	Y		
Samples received intact and chilled?	Y	ALS: 0.6°C - Ice present. Envirolab: 11.2°C - Ice.	
Samples analysed within appropriate holding times?	Y	All	
Sample volumes sufficient for QC analysis?	Y		
Are there non-NATA accredited methods used?	Y	Estimations of Asbestos weight and percentages are not covered under the Scope of NATA Accreditation. See comments.	
Chromatograms supplied as appropriate?	N/A		
Laboratory reports signed by authorised personnel?	Y		

QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)			
Type	Sample ID	Comments	
MB	Method Blank	All results less than LOR (ALS and Envirolab).	
RB	QC300_25/06/13, QC301_26/06/13, QC302_27/06/13	All results less than LOR.	
TB	QC400_25/06/13	All results less than LOR, except manganese (10 mg/kg) in QC400, manganese (12 mg/kg) in QC 401 and manganese (8 mg/kg) in QC402.	

Trip Spike Information				
Analyte	Spike Concentrations	Recovery Concentration	% Recovery	Comments
N/A	N/A	N/A	N/A	No trip spike submitted for this batch.

Laboratory Control Spike (LCS) Analyses	
Analyte Group	Comments
All (ALS)	LCS ALS recoveries were within the laboratory recovery control limits.
All (Envirolab)	All Envirolab LCS recoveries were within the laboratory recovery control limits.

Matrix Spike (MS) Analyses	
Analyte Group	Comments
Total Metals	MS recovery of arsenic (29.3%) in sample TP30_0.0-0.1_25/06/13 were less than lower data quality objective (70%).
Total Metals	MS recovery of copper in sample TP30_0.0-0.1_25/06/13 were not determined.
Total Metals	MS recovery of copper in sample TP15_0.0-0.1_26/06/13 were not determined.
Total Metals	MS recovery of lead (210%) in sample TP30_0.0-0.1_25/06/13 were greater than upper data quality objective (130%).
Total Metals	MS recovery of zinc (429%) in sample TP30_0.0-0.1_25/06/13 were greater than upper data quality objective (130%).
Total Petroleum Hydrocarbons	MS recovery of C6 - C9 Fraction on anonymous sample were not determined.
Total Recoverable Hydrocarbons - NEPM	MS recovery of C6 - C10 Fraction on anonymous sample were not determined.
BTEXN	MS recovery of meta- & para-Xylene Fraction on anonymous sample were not determined.
BTEXN	MS recovery of ortho-Xylene on anonymous sample were not determined.
All	All other MS recoveries from ALS were within the laboratory control limits.
All	No MS recoveries were performed on Envirolab batch.

Laboratory Duplicates (LD) Analyses			
Analyte Group	Analyte(s)	Sample ID	Comments
Total Metals	Arsenic	TP30_0.0-0.1_25/06/13	RPD of arsenic (30%) exceeded LOR based limits (20%).
Total Metals	Zinc	TP30_0.0-0.1_25/06/13	RPD of zinc (30.7%) exceeded LOR based limits (20%).
Total Phosphorus as P	Total Phosphorus as P	TP26_0.5-0.6_25/06/13	RPD of Total Phosphorus as P (27.7%) exceeded LOR based limits (20%).
All			All other LD results from ALS and Envirolab were within the laboratory control limits or below the LOR.

Field Duplicates (FD) Analyses			
Analyte(s)	Primary ID	Duplicate ID	Comments
Total Metals /PAH	TP25_0.0-0.1	QC100	RPDs for Copper (41.2%), Lead (65%), Zinc (95%) and Sum of PAH (67.7%) were outside the acceptable control limits.
All	TP8_0.0-0.1	QC101	All RPDs were within the LOR based limits.
Total Metals	TP5_0.5-0.6	QC102	RPDs for Copper (155.1%), Lead (155%) and Manganese (87%) were outside the acceptable control limits.

Field Triplicates (FT) Analyses			
Analyte(s)	Primary ID	Triplicate ID	Comments
Total Metals	TP25_0.0-0.1	QC200	RPDs for Copper (37.7%), Lead (60.6%) and Zinc (52.6%) were outside the acceptable control limits.
Moisture Content /Total Metals	TP8_0.0-0.1	QC201	RPDs for Chromium (51.4%), Lead (66.3%) and Manganese (39.1%) were outside the acceptable control limits.
Total Metals	TP5_0.5-0.6	QC202	RPDs for Copper (155.1%), Lead (155%), Zinc (94.7%) and Manganese (87%) were outside the acceptable control limits.

Surrogate Compound Monitoring Analyses		
Analyte Group	Sample ID	Comments
TPH(V)/BTEX Surrogates	4-Bromofluorobenzene	Surrogate recovery of 4-Bromofluorobenzene (70.6%) in sample TP3_0.0-0.1_27/06/13 were less than lower data quality objective (71.6%).
		All other surrogates were within the acceptance control limit.

Overall Comments

As stated by ALS: Negative results for vinyl tiles should be confirmed by an independent analytical technique.

As stated by ALS: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2011 NEPM for Assessment of Site Contamination.

As stated by ALS: Estimations of Asbestos weight and percentages are not covered under the Scope of NATA Accreditation. Weights and percentages of Asbestos are approximate estimates only. Weights are based on extracted fibre bundles and ACM, and percentages are estimated based on the NEPM default Asbestos content in ACM. All numerical results under this method are approximate and should be used as a guide only.

As stated by ALS: Poor precision and poor spike recovery was obtained for some elements on sample TP30_0.0-0.1_25/06/13. Results have been confirmed by re-extraction and reanalysis.

As stated by ALS: Poor precision was obtained for Lead on sample TP30_0.0-0.1_25/06/13. Results have been confirmed by re-extraction and reanalysis.

As stated by ALS: LOR raised for Nitrite/NOx analysis on various samples due to sample matrix.

As stated by ALS: Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.

Field blanks had detections of manganese (10 mg/kg, 12 mg/kg and 8 mg/kg) which could lead to slight over-reporting for this compound. However, as the field blank was prepared by the laboratory it is likely the water used was contaminated from the laboratory. Considering the detection was just slightly above the LOR and all other QCs (RB, MB, LCS, LD) were within the acceptable control limits, it is not expected that this could affect the overall data quality of this batch.

Matrix Spike recovery for copper, C6 - C9 Fraction, C6 - C10 Fraction, meta- & para-Xylene and ortho-Xylene were not determined due to background level greater than or equal to four times spike level.

Surrogate recovery for 4-Bromofluorobenzene in sample TP3_0.0-0.1_27/06/13 was less than the lower data quality objective. This is not expected to affect the validity of this batch, as exceedence is only marginal.

LD RPDs for Arsenic, Zinc and Total Phosphorus as P in samples TP30_0.0-0.1_25/06/13 and TP26_0.5-0.6_25/06/13 exceed LOR based limits. This is likely due to sample heterogeneity in soil samples. This is not expected to affect the validity of this batch.

High RPD results were observed for total metals and sum of PAHs between the primary/duplicate samples TP25_0.0-0.1 and QC100 and primary/duplicate TP5_0.5-0.6/QC102 respectively. This may be due to the sample heterogeneity. The highest value will be used for reporting purpose, as a conservative measure

High RPD results were observed for total metals and between the primary/triplicates samples TP25_0.0-0.1/QC200, TP8_0.0-0.1/QC201 and TP5_0.5-0.6/QC202 respectively. This may be due to different techniques used for the two laboratories and it is not expected to affect the quality data of this batch. As a conservative measure the highest value will be used for reporting purpose.

This batch has been validated and is considered suitable for environmental interpretive use.

Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.

*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated

Performed By:	Olga Bukhteeva	Reviewed By:	Carolina Olmos
Date:	18/07/2013	Date:	25/07/2013

Sample ID Sample Type Date Sampled			TP25 0.0-0.1	QC100	QC200		
			Primary Sample	Field Duplicate	Field Triplicate		
			26/06/2013	26/06/2013	26/06/2013	RPDs	
Analyte	Unit	LOR				Primary vs Duplicate	Primary vs Triplicate
Total Metals							
Arsenic	mg/kg	5	10	7	6	35.3%	50.0%
Cadmium	mg/kg	1	3	2	2.4	40.0%	22.2%
Chromium	mg/kg	2	9	6	7	40.0%	25.0%
Copper	mg/kg	5	791	521	540	41.2%	37.7%
Iron	mg/kg	50	12000		-	-	-
Lead	mg/kg	5	243	124	130	64.9%	60.6%
Manganese	mg/kg	5	296	319	360	7.5%	19.5%
Mercury	mg/kg	0.1	0.2	0.1	0.1	66.7%	66.7%
Nickel	mg/kg	2	12	10	9	18.2%	28.6%
Selenium	mg/kg	5	<5	<5	3	ND	ND
Zinc	mg/kg	5	514	190	300	92.0%	52.6%
Total Petroleum Hydrocarbons							
C6 - C9 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C10 - C14 Fraction	mg/kg	50	<50	<50	<50	ND	ND
C15 - C28 Fraction	mg/kg	100	360	550	<100	41.8%	ND
C29 - C36 Fraction	mg/kg	100	180	240	<100	28.6%	ND
C10 - C36 Fraction (sum)	mg/kg	50	540	790	-	37.6%	-
Total Recoverable Hydrocarbons - NEPM 2010 Draft							
C6 - C10 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	<10	<10	<25	ND	ND
>C10 - C16 Fraction	mg/kg	50	<50	<50	<50	ND	ND
>C16 - C34 Fraction	mg/kg	100	480	700	100	37.3%	131.0%
>C34 - C40 Fraction	mg/kg	100	<100	110	<100	ND	ND
>C10 - C40 Fraction (sum)	mg/kg	50	480	810	-	51.2%	-
BTEXN							
Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	ND	ND
Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
meta- & para-Xylene	mg/kg	0.5	<0.5	<0.5	<2	ND	ND
ortho-Xylene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
Total Xylenes	mg/kg	0.5	<0.5	<0.5	-	ND	-
Sum of BTEX	mg/kg	0.2	<0.2	<0.2	-	ND	-
Naphthalene	mg/kg	1	<1	<1	<1	ND	ND
Organochlorine Pesticides (OC)							
alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Hexachlorobenzene (HCB)	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
gamma-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Aldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Total Chlordane (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
trans-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
alpha-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
cis-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Endrin ketone	mg/kg	0.05	<0.05	<0.05	-	ND	-
Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Sum of Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	-	ND	-
Sum of DDD + DDE + DDT	mg/kg	0.05	<0.05	<0.05	-	ND	-
Organophosphorus Pesticides (OP)							
Dichlorvos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Demeton-S-methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Monocrotophos	mg/kg	0.2	<0.2	<0.2	-	ND	-
Dimethoate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Diazinon	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Chlorpyrifos-methyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Parathion-methyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Malathion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Fenthion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Parathion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Fenamiphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Prothiofos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Ethion	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Carbophenothion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Azinphos Methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Phenolic Compounds							
Phenol	mg/kg	0.5	<0.5	<0.5	<5	ND	ND
2-Chlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
3- & 4-Methylphenol	mg/kg	1	<1	<1	-	ND	-
2-Nitrophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,6-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
4-Chloro-3-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,6-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,5-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Pentachlorophenol	mg/kg	2	<2	<2	-	ND	-
Polynuclear Aromatic Hydrocarbons							
Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluorene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Phenanthrene	mg/kg	0.5	1.8	3.2	0.4	56.0%	127.3%
Anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluoranthene	mg/kg	0.5	0.5	0.9	0.1	57.1%	133.3%
Pyrene	mg/kg	0.5	0.8	1.4	0.1	54.5%	155.6%
Benz(a)anthracene	mg/kg	0.5	<0.5	0.7	0.1	ND	ND
Chrysene	mg/kg	0.5	1.2	2	0.2	50.0%	142.9%
Benzo(b)fluoranthene	mg/kg	0.5	<0.5	0.5	-	ND	-
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0.05	ND	ND
Indeno(1.2.3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	4.3	8.7	1	67.7%	124.5%
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ammonia as N	mg/kg	20	<20	<20	-	ND	-

Legend
ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)
- = not analysed
Acceptable RPDs: RPD <= 30%
RPD > 30%, Analysis result < 10 times LOR
RPD <= 50%, Analysis result > 10 times LOR and < 20 times LOR

Sample ID Sample Type Date Sampled			TP8 0.0-0.1	QC101	QC201		
			Primary Sample	Field Duplicate	Field Triplicate		
			26/06/2013	26/06/2013	26/06/2013	RPDs	
Analyte	Unit	LOR				Primary vs Duplicate	Primary vs Triplicate
Total Metals							
Arsenic	mg/kg	5	41	44	21	7.1%	64.5%
Cadmium	mg/kg	1	10	14	7.3	33.3%	31.2%
Chromium	mg/kg	2	22	23	13	4.4%	51.4%
Copper	mg/kg	5	2280	1760	1800	25.7%	23.5%
Iron	mg/kg	50	38500		-	-	-
Lead	mg/kg	5	677	628	340	7.5%	66.3%
Manganese	mg/kg	5	609	492	410	21.3%	39.1%
Mercury	mg/kg	0.1	0.3	0.4	0.6	28.6%	66.7%
Nickel	mg/kg	2	12	12	12	0.0%	0.0%
Selenium	mg/kg	5	<5	<5	4	ND	ND
Zinc	mg/kg	5	397	529	360	28.5%	9.8%
Total Petroleum Hydrocarbons							
C6 - C9 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C10 - C14 Fraction	mg/kg	50	<50	<50	<50	ND	ND
C15 - C28 Fraction	mg/kg	100	<100	<100	<100	ND	ND
C29 - C36 Fraction	mg/kg	100	<100	<100	<100	ND	ND
C10 - C36 Fraction (sum)	mg/kg	50	<50	<50	-	ND	-
Total Recoverable Hydrocarbons - NEPM 2010 Draft							
C6 - C10 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	<10	<10	<25	ND	ND
>C10 - C16 Fraction	mg/kg	50	<50	<50	<50	ND	ND
>C16 - C34 Fraction	mg/kg	100	<100	<100	<100	ND	ND
>C34 - C40 Fraction	mg/kg	100	<100	<100	<100	ND	ND
>C10 - C40 Fraction (sum)	mg/kg	50	<50	<50	-	ND	-
BTEXN							
Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	ND	ND
Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
meta- & para-Xylene	mg/kg	0.5	<0.5	<0.5	<2	ND	ND
ortho-Xylene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
Total Xylenes	mg/kg	0.5	<0.5	<0.5	-	ND	-
Sum of BTEX	mg/kg	0.2	<0.2	<0.2	-	ND	-
Naphthalene	mg/kg	1	<1	<1	<1	ND	ND
Organochlorine Pesticides (OC)							
alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Hexachlorobenzene (HCB)	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
gamma-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Aldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Total Chlordane (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
trans-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
alpha-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
cis-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Endrin ketone	mg/kg	0.05	<0.05	<0.05	-	ND	-
Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Sum of Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	-	ND	-
Sum of DDD + DDE + DDT	mg/kg	0.05	<0.05	<0.05	-	ND	-
Organophosphorus Pesticides (OP)							
Dichlorvos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Demeton-S-methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Monocrotophos	mg/kg	0.2	<0.2	<0.2	-	ND	-
Dimethoate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Diazinon	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Chlorpyrifos-methyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Parathion-methyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Malathion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Fenthion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Parathion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Fenamiphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Prothiofos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Ethion	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Carbophenothion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Azinphos Methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Phenolic Compounds							
Phenol	mg/kg	0.5	<0.5	<0.5	<5	ND	ND
2-Chlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
3- & 4-Methylphenol	mg/kg	1	<1	<1	-	ND	-
2-Nitrophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,6-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
4-Chloro-3-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,6-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,5-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Pentachlorophenol	mg/kg	2	<2	<2	-	ND	-
Polynuclear Aromatic Hydrocarbons							
Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluorene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Chrysene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.05	ND	ND
Indeno(1.2.3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	<0.5	<0.5	ND	ND	ND
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ammonia as N	mg/kg	20	<20	<20	-	ND	-

Legend
ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)
- = not analysed
Acceptable RPDs: RPD <= 30%
RPD > 30%, Analysis result < 10 times LOR
RPD > 50%, Analysis result > 10 times LOR and < 20 times LOR

Sample ID Sample Type Date Sampled			TP5 0.5-0.6	QC102	QC202		
			Primary Sample	Field Duplicate	Field Triplicate		
			27/06/2013	27/06/2013	27/06/2013	RPDs	
Analyte	Unit	LOR				Primary vs Duplicate	Primary vs Triplicate
Total Metals							
Arsenic	mg/kg	5	33	<5	7	147.4%	130.0%
Cadmium	mg/kg	1	4	4	1.9	0.0%	71.2%
Chromium	mg/kg	2	13	12	8	8.0%	47.6%
Copper	mg/kg	5	467	59	130	155.1%	112.9%
Iron	mg/kg	50			-	-	-
Lead	mg/kg	5	71	9	17	155.0%	122.7%
Manganese	mg/kg	5	94	37	28	87.0%	108.2%
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	ND	ND
Nickel	mg/kg	2	6	5	3	18.2%	66.7%
Selenium	mg/kg	5	<5	<5	<2	ND	ND
Zinc	mg/kg	5	112	104	40	7.4%	94.7%
Total Petroleum Hydrocarbons							
C6 - C9 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C10 - C14 Fraction	mg/kg	50	<50	<50	<50	ND	ND
C15 - C28 Fraction	mg/kg	100	<100	<100	<100	ND	ND
C29 - C36 Fraction	mg/kg	100	<100	<100	<100	ND	ND
C10 - C36 Fraction (sum)	mg/kg	50	<50	<50	-	ND	-
Total Recoverable Hydrocarbons - NEPM 2010 Draft							
C6 - C10 Fraction	mg/kg	10	<10	<10	<25	ND	ND
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	<10	<10	<25	ND	ND
>C10 - C16 Fraction	mg/kg	50	<50	<50	<50	ND	ND
>C16 - C34 Fraction	mg/kg	100	<100	<100	<100	ND	ND
>C34 - C40 Fraction	mg/kg	100	<100	<100	<100	ND	ND
>C10 - C40 Fraction (sum)	mg/kg	50	<50	<50	-	ND	-
BTEXN							
Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	ND	ND
Toluene	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
meta- & para-Xylene	mg/kg	0.5	<0.5	<0.5	<2	ND	ND
ortho-Xylene	mg/kg	0.5	<0.5	<0.5	<1	ND	ND
Total Xylenes	mg/kg	0.5	<0.5	<0.5	-	ND	-
Sum of BTEX	mg/kg	0.2	<0.2	<0.2	-	ND	-
Naphthalene	mg/kg	1	<1	<1	<1	ND	ND
Organochlorine Pesticides (OC)							
alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Hexachlorobenzene (HCB)	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
gamma-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Aldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Total Chlordane (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
trans-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
alpha-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
cis-Chlordane	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
beta-Endosulfan	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan (sum)	mg/kg	0.05	<0.05	<0.05	-	ND	-
4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Endrin ketone	mg/kg	0.05	<0.05	<0.05	-	ND	-
Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.1	ND	ND
Sum of Aldrin + Dieldrin	mg/kg	0.05	<0.05	<0.05	-	ND	-
Sum of DDD + DDE + DDT	mg/kg	0.05	<0.05	<0.05	-	ND	-
Organophosphorus Pesticides (OP)							
Dichlorvos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Demeton-S-methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Monocrotophos	mg/kg	0.2	<0.2	<0.2	-	ND	-
Dimethoate	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Diazinon	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Chlorpyrifos-methyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Parathion-methyl	mg/kg	0.2	<0.2	<0.2	-	ND	-
Malathion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Fenthion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Parathion	mg/kg	0.2	<0.2	<0.2	-	ND	-
Pirimphos-ethyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Chlorfenvinphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Bromophos-ethyl	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Fenamiphos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Prothiofos	mg/kg	0.05	<0.05	<0.05	-	ND	-
Ethion	mg/kg	0.05	<0.05	<0.05	<0.1	ND	ND
Carbophenothion	mg/kg	0.05	<0.05	<0.05	-	ND	-
Azinphos Methyl	mg/kg	0.05	<0.05	<0.05	-	ND	-
Phenolic Compounds							
Phenol	mg/kg	0.5	<0.5	<0.5	<5	ND	ND
2-Chlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
3- & 4-Methylphenol	mg/kg	1	<1	<1	-	ND	-
2-Nitrophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,6-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
4-Chloro-3-Methylphenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,6-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
2,4,5-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	-	ND	-
Pentachlorophenol	mg/kg	2	<2	<2	-	ND	-
Polynuclear Aromatic Hydrocarbons							
Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluorene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Chrysene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	-	ND	-
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.05	ND	ND
Indeno(1,2,3.cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	<0.1	ND	ND
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	<0.5	<0.5	ND	ND	ND
Benzo(a)pyrene TEQ (WHO)	mg/kg	0.5	<0.5	<0.5	<0.5	ND	ND
Ammonia as N	mg/kg	20	<20	<20	-	ND	-

Legend
ND = Not Detected (RPDs not calculated if both primary and duplicate results are below LOR)
- = not analysed
Acceptable RPDs: RPD <= 30%
RPD > 30%, Analysis result < 10 times LOR
RPD >= 50%, Analysis result > 10 times LOR and < 20 times LOR

DATA VALIDATION SUMMARY SHEET (Sydney)			
Project Name:		PKC - Phase II Primary School Port Kembla	
Primary Laboratory:		ALS	
Secondary Laboratory:		N/A	
Date Sampled:		9/10/2013	
Project Number:		137623028	
Workorder Number:		ES1322093	
Workorder Number:		N/A	
Sample Medium:		Soil	
Sample Information			
Number of Primary Samples:		12	
Number of Duplicate Samples:		0	
Number of Triplicate Samples:		0	
Number of Other QAQC Samples:		0	
Documentation and Sample Handling Information			
		Y/N	Comments
COC completed properly?		Y	Signed for field scientist and laboratory personnel. Email correspondence.
All requested analysis completed?		Y	
Samples received intact and chilled?		Y	ALS: 8.6°C - Ice present.
Samples analysed within appropriate holding times?		Y	All
Sample volumes sufficient for QC analysis?		Y	
Are there non-NATA accredited methods used?		Y	ALS is not NATA accredited for the analysis of Bifenthrin in soils when performed under ALS Method EP068D.
Chromatograms supplied as appropriate?		N/A	
Laboratory reports signed by authorised personnel?		Y	
QAQC Sample Information (Method Blank - MB, Rinsate Blank - RB, Field Blank - FB, Trip Blank - TB)			
Type	Sample ID	Comments	
MB	Method Blank	All results less than LOR.	
Trip Spike Information			
Analyte	Spike Concentrations	Recovery Concentration	% Recovery
N/A	N/A	N/A	N/A
Comments			
No trip spike submitted for this batch.			
Laboratory Control Spike (LCS) Analyses			
Analyte Group		Comments	
All (ALS)		LCS ALS recoveries were within the laboratory recovery control limits.	
Matrix Spike (MS) Analyses			
Analyte Group		Comments	
Total Metals		MS recovery of copper (174%) in sample BH4-0.4-09/10/13 were greater than upper data quality objective (130%).	
Total Phosphorus as P		MS recovery of Total Phosphorus as P (59.9%) in sample BH4-0.4-09/10/13 were less than lower data quality objective (70%).	
All		All other MS recoveries from ALS were within the laboratory control limits.	
Laboratory Duplicates (LD) Analyses			
Analyte Group	Analyte(s)	Sample ID	Comments
Total Metals	Manganese	BH5-1.0-09/10/13	RPD of manganese (47.9%) exceeded LOR based limits (20%).
All			All other LD results from ALS were within the laboratory control limits or below the LOR.
Field Duplicates (FD) Analyses			
Analyte(s)	Primary ID	Duplicate ID	Comments
			No field duplicates were taken for this batch.
Field Triplicates (FT) Analyses			
Analyte(s)	Primary ID	Triplicate ID	Comments
			No field triplicates were taken for this batch.
Surrogate Compound Monitoring Analyses			
Analyte Group	Sample ID	Comments	
		All surrogate recoveries were within the acceptance control limit.	
Overall Comments			
As stated by ALS: Poor matrix spike recovery was obtained for Copper on sample BH4-0.4-09/10/13. Results have been confirmed by re-extraction and reanalysis. As stated by ALS: Poor precision was obtained for Manganese on sample BH5-1.0-09/10/13 due to sample heterogeneity. Results have been confirmed by re-extraction and reanalysis. As stated by ALS: LOR raised for Nitrite/NOx and Nitrate analysis on various samples due to sample matrix. As stated by ALS: Spike failed for Total P analysis due to matrix interferences (Confirmed by re-digestion and re-analysis). LD RPD for Manganese in sample BH5-1.0-09/10/13 exceed LOR based limits. This is likely due to sample heterogeneity in soil samples. This is not expected to affect the validity of this batch.			
This batch has been validated and is considered suitable for environmental interpretive use.			
Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form. *When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated			
Performed By:		Reviewed By:	
Date:		Date:	
Olga Bukhteeva 31/10/2013		Carolina Olmos 2/11/2013	



APPENDIX F

Calibration Certificates

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-105869**



Air-Met Scientific Pty Ltd
1300 137 067

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

Certificate of Calibration

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

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		100ppm Isobutylene	NIST	SY21		100.4ppm

Calibrated by:  Sophie Boler

Calibration date: 8/10/2013

Next calibration due: 7/11/2013



APPENDIX G

Limitations



LIMITATIONS

This Document has been provided by Golder Associates Pty Ltd ("Golder") subject to the following limitations:

This Document has been prepared for the particular purpose outlined in Golder's proposal 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 Golder's Services are as described in Golder's proposal, and are subject to restrictions and limitations. Golder 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 Golder in regards to it.

Conditions may exist which were undetectable given the limited nature of the enquiry Golder 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. Golder'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 Golder to form no more than an opinion of the actual conditions of the site at the time the site was visited 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 Golder for incomplete or inaccurate data supplied by others.

Golder may have retained subconsultants affiliated with Golder to provide Services for the benefit of Golder. 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, Golder's affiliated companies, and their employees, officers and directors.

This Document is provided for sole use by the Client and is confidential to it and its professional advisers. No responsibility whatsoever for the contents of this Document will be accepted to any person other than the Client. Any use which a third party makes of this Document, or any reliance on or decisions to be made based on it, is the responsibility of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this Document.

At Golder Associates we strive to be the most respected global company providing consulting, design, and construction services in earth, environment, and related areas of energy. Employee owned since our formation in 1960, our focus, unique culture and operating environment offer opportunities and the freedom to excel, which attracts the leading specialists in our fields. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees who operate from offices located throughout Africa, Asia, Australasia, Europe, North America, and South America.

Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

solutions@golder.com
www.golder.com

Golder Associates Pty Ltd
124 Pacific Highway
St. Leonards New South Wales 2065
Australia
T: +61 2 9478 3900

