

Phase 2 Environmental Site Assessment

Northern Beaches Hospital

November 2014



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SUMMARY

The planning approval conditions for the Northern Beaches Hospital (NBH) Concept Proposal and Stage 1 site clearance and preparatory works require the preparation of a Phase 2 Environmental Site Assessment (ESA) addressing certain matters, and for this to be submitted with the Stage 2 planning application. SMEC Australia Pty Ltd (SMEC) was engaged by Health Infrastructure (HI) to conduct the Phase 2 ESA for the NBH site at the corner of Wakehurst Parkway and Warringah Road, Frenchs Forest, NSW (the site).

A number of previous environmental investigations have been undertaken at the site that identified the potential for pesticide-related contamination from a former neighbouring orchard, near surface topsoil fill disturbances and asbestos fragments identified on the ground surface of the former residential area.

This Phase 2 ESA presents findings from both the review of previous Phase 1 ESA, historic information specific to the site, site features observed during site inspections, and intrusive investigations (including soil and groundwater sampling and analysis). At the time Phase 2 ESA commenced (October 2014), no operational groundwater monitoring wells remained on site due to piezometers being inadvertently removed during vegetation clearance and the Stage 1 site clearance and preparatory works. In view of this, the investigation has drawn on the analytical results of the 2013 groundwater sampling work.

Based on work carried out for the Phase 2 ESA, the following was noted:

- Sampling and analysis was undertaken at 64 sample locations across the site to target historical environmental issues identified in previous investigations which established:
 - Extensive grid based test pit sampling in the western portion of the site, with low levels of pesticides (DDT, DDD) detected at one location (TP15) only
 - The subsurface across the site showed no staining or odours; while low levels of hydrocarbons were detected at 14 locations, the source of these is considered to be from eucalyptus wood chips and/or grease from tree felling machinery
 - The presence of asbestos was detected within buried waste identified in backfilled swimming pools and house cellars, a stockpile of concrete and on the ground surface in cleared vegetation areas that were previously not accessible
 - No asbestos was observed at the location of the former community health centre building, i.e. the current location of the Stage 1 site clearance and preparatory works site office
 - The majority of vegetation was cleared at the time of the Phase 2 ESA field investigation with the exception of individual retained large trees around the general perimeter of the site and vegetation in the retained vegetation zone (RVZ) at the eastern end of the site. Thinning of understorey vegetation in the RVZ revealed domestic waste such as scrap metal dumped on the ground surface
 - Test pit investigations in the cleared vegetation areas revealed buried waste fill in six locations
 - Heavy metal concentrations above ecological investigation levels (EILs) were identified in near surface soils mainly in the former residential areas of the site where bush tracks, concrete slabs or buildings were previously located.
- Analytical soil results indicate elevated levels (as compared to the soil assessment criteria) of heavy metals (Cu, Zn, Ni) above EIL criteria but well below the adopted health investigation level (HIL) D commercial/industrial' land use criteria within near surface soils at five Phase 1 ESA locations and eight Phase 2 ESA locations

- Analytical confirmation of asbestos contamination was identified at one location (TP7), while visual observations of asbestos containing material (ACM) were recorded at several surface and subsurface locations across the site
- On the basis of the intermittent and heterogeneous nature of fill material observed during site investigations, the fill material at the site may contain localised contamination hotspots
- Targeted intrusive investigations within the fill areas in the northeast and southeast quadrants did not identify chemical contamination associated with fill materials
- Analytical groundwater results reported total petroleum hydrocarbons (TPH) concentrations below laboratory limits of reporting (LOR), with the exception of low concentrations of TPH C₆-C₁₀ detected during the first round due to contamination from the hydrocarbon-based grease used during drilling
- Elevated heavy metal concentrations in groundwater are likely to be representative of background conditions and unlikely to be associated with any site-based sources of contamination
- Provided the identified ACM is managed appropriately, and unexpected find protocols are in place, the contamination occurring on the site is unlikely to pose an unacceptable risk to human health and/or the environment
- On the basis of the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (DECC, 2009), the site does not currently require notification under Section 60 of the *Contaminated Land Management Act 1997*

Based on the work carried out for this Phase 2 ESA, the following is recommended:

- Preparation of a Remedial Action Plan (RAP) that includes but is not limited to:
 - An Asbestos Management Plan (AMP) documenting the requirement for air monitoring during removal works and the necessity for engaging appropriately licensed Class B Removalist (for known bonded asbestos), Class A removalist (if friable asbestos is encountered) and independent Class A Asbestos Assessor for the purpose of site clearance
 - Framework for site validation to make the site suitable for the end land uses
 - Development of site validation criteria including calculated EILs in terms of a site-specific ecological risk assessment having consideration for potential receptors
- Given near surface soils exceeded the preliminary EIL site criteria for copper, zinc and nickel, it is recommended that EILs are further developed in the RAP in terms of future amenity planting
- The CEMP for the Stage 1 site clearance and preparatory works should be reviewed and revised as appropriate with regard to inclusion of a Waste Management Plan (WMP) documenting the procedures (including stockpile tracking, waste classification and disposal) for remediating and managing:
 - C&D waste and domestic litter identified at the site either buried or dumped on ground surface
 - ACM contamination identified in surface soils, buried fill, C&D waste and on the underside of concrete stockpiled in southeast corner
 - Unexpected finds of contaminated fill during the proposed redevelopment works.
- Prior to commencement of Stage 2 development works, preparation of a CEMP that includes a Waste Management Plan (WMP) addressing the matters in the preceding recommendation.

It is concluded that subject to development and implementation of a CEMP, RAP and site validation, the site is considered suitable for its proposed use in accordance with the adopted NEPM 2013 land use categories of 'commercial' and 'public open spaces'.

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ABBREVIATIONS AND ACRONYMS

Abbreviation/ Acronym	Description
ACM	Asbestos containing material
AEC	Areas of environmental concern
AHD	Australian Height Datum
ALS	Analytical Laboratory Services
AMP	Asbestos management plan
ANZECC	Australian and New Zealand Environment and Conservation Council
ARCP	Asbestos removal control plan
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
As	Arsenic
bgl	Below ground level
BTEX	Benzene/Toluene/Ethylbenzene/Xylene
C&D	Construction and demolition
CEC	Cation exchange capacity
CEMP	Construction Environmental Management Plan
COC	Chain of custody
CoCs	Contaminants of concern
Cd	Cadmium
Cr	Chromium
Cu	Copper
DECC	Department of Environment, Climate Change and Water
DDT	Dichlorodiphenyltrichloroethane
DP	Douglas Partners
DQI	Data quality indicator
DQO	Data quality objective
EIL	Ecological investigation level
EQL	estimated quantitation limit
ERA	Ecological risk assessment
ESA	Environmental site assessment
ESL	Ecological screening level
EPA	Environment Protection Authority
GIL	Groundwater investigation level
Hg	Mercury
HSL	Health screening level
HAC	Health Administration Corporation
HI	Health Infrastructure
HIL	Health investigation level

Abbreviation/ Acronym	Description
HSL	Health screening level
JSEA	Job safety and environmental analysis
JSA	Job safety analysis
LOR	Limit of reporting
M	Metres
MLs	Management limits
NATA	National Association of Testing Authorities
NBH	Northern Beaches Hospital
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
Ni	Nickel
NSW	New South Wales
OCPs	Organochlorine pesticides
OPPs	Organophosphate pesticides
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PBILs	Provisional phytotoxicity based investigation levels
PCBs	Polychlorinated biphenyls
PID	Photoionisation detector
PQL	Practical quantitation limit
PSH	Phase separated hydrocarbon
QA	Quality assurance
QC	Quality control
RAP	Remedial action plan
RPD	Relative percentage difference
RLs	Relative levels
RVZ	Retained vegetation zone
SMEC	Snowy Mountains Engineering Corporation
SOP	Standard operating procedures
SSI	State Significant Infrastructure
SWMS	Safe work method statements
TC	Tungsten carbide
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
USCS	Unified soil classification system
VENM	Virgin excavated natural material
VOCs	Volatile organic compounds
WMP	Waste management plan

Abbreviation/ Acronym	Description
Zn	Zinc

1. INTRODUCTION

1.1. Background

Planning approval for the Northern Beaches Hospital (NBH) Concept Proposal and Stage 1 site clearance and preparatory works was granted on 22 June 2014. Condition B13, Schedule 2 of the approval states:

A Phase 2 contamination assessment report shall be prepared and submitted with the SSI application for the detailed design and construction of the NBH, having regard to the recommendations provided within the Phase 1 Contamination Assessment, prepared by Douglas Partners, dated July 2012.

In this regard, the Douglas Partners (DP) report recommendations are summarised in the following table and comment provided as to their relevance to this report:

Table 1.1 Douglas Partners Phase1 contamination assessment recommendations

Recommendation	Comment
1. Clearance of areas with asbestos containing material (ACM) by a suitably qualified occupational hygienist	Addressed through this report
2. Conduct a hazardous materials survey on the Community Health Centre building	Completed in February 2013
3. Preparation of a report confirming removal of hazardous materials	Will be addressed through recommendations provided in this report
4. Preparation of an unexpected finds procedure	- Included in Appendix I to the Stage 1 site clearance and preparatory works construction environmental management plan - Provided as recommendation in this report (refer Section 10.2) with respect to Stage 2 development

SMEC Australia Pty Ltd (SMEC) was engaged by Health Infrastructure (HI) to conduct the Phase 2 environmental site assessment (ESA) for the NBH site. It should be noted that the Stage 1 site clearance and preparatory works had commenced prior to the Phase 2 ESA and were still underway at the time of the field investigations.

The investigation area covers an area of approximately 5.6 ha and is located at the corner of Wakehurst Parkway and Warringah Road, Frenchs Forest NSW (see **Figure 1, Appendix A**). The site is bounded by Frenchs Forest Road West to the north, Wakehurst Parkway to the east (note there is an intervening road reserve of about 20 metres width), Warringah Road to the south and The Forest High School to the west. The northern section of Bantry Bay Road extends through the site but is no longer a public road.

A number of previous environmental investigations have been undertaken at the site that identified the following issues with respect to potential contamination:

- Potential spray drift from a former orchard located to the west of the site
- Near-surface topsoil fill disturbances
- Asbestos fragments identified on the ground surface.

These matters are also considered in this report.

1.2. Project objectives

The objectives of this Phase 2 ESA are to:

- Assist HI and the Hospital Operator in identifying and managing risks associated with the site regarding the potential for contamination
- Assess existing documentation relating to past and present land-use and develop a sampling and analysis plan (SAP) to facilitate an investigation of those portions of the site that may be contaminated
- Determine the nature and extent of soil and groundwater contamination (if any) at the site
- Assess the human health and environmental risks associated with any identified contamination by comparing contaminant concentrations to NEPM (2013) and ANZECC/ARMCANZ(2000) assessment guidelines and established site assessment criteria, noting the proposed 'commercial /industrial' land use¹
- Document the investigation and findings as a Phase 2 ESA report suitable for submission with the Stage 2 planning application.

1.3. Scope of works

The scope of works for the Phase 2 ESA comprised the following:

- Review of existing environmental reports and other documented information relating to the subject site including:
 - o *Preliminary Geotechnical Investigation* (Douglas Partners, July 2013)
 - o *Preliminary Site Contamination Assessment Report* (Coffey, March 2011)
 - o *Phase 1 Contamination Assessment with Limited Sampling* (Douglas Partners, July 2013)
 - o *Northern Beaches Hospital Groundwater Factual Report* (SMEC, September 2013)
 - o *Virgin Excavated Natural Material Assessment – Northern Beaches Hospital Site Enabling Works* (SMEC, August 2014)
- Preparation of Safe Work Method Statements (SWMS) and Job Safety Analysis (JSA) for the field work
- Reinstating the sample locations to conditions considered safe.

Phase 2 ESA fieldwork component

The scope of the Phase 2 ESA has been detailed by HI and includes:

- Site walkover by experienced SMEC Environmental Engineer/Scientist to assess present and past potentially contaminating activities, current landforms and site condition
- Preparation of a SAP and definition of Data Quality Objectives (DQOs)
- Within the western half of the site obtain soil samples at 40 locations based on a grid pattern to target potential pesticide spray drift from historic neighbouring orchard
- Within the east half of the site under former building slabs, target four test pit locations
- In the cleared areas along the back of the former residential properties, target eight test pit locations
- Along Bantry Bay Road, target five test pit locations
- Drill 10 geotechnical boreholes to RL 154.0, (nine as part of separate scope of works) and sample the near surface soils for environmental contaminants of concern at selected locations
- The number and location of the soil samples selected for analytical testing were to:

¹ 'Commercial/industrial' is a land use category provided under NEPM 2013 and has been adopted as the most suitable for the hospital development. Further explanation is provided in Section 5.

- o Target Areas of Environmental Concern (AEC) identified in previous reports
- o Comply with the amended National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013)
- Logging the soil lithology in each of the sample locations in accordance with the Unified Soil Classification System (USCS)
- Screening the soil for volatile organic compounds (VOCs) using a photoionisation detector (PID), and visual and olfactory observations
- Delivering soil samples to a NATA accredited laboratory, with accompanying chain of custody documentation (Envirolab and ALS Environmental)
- Analysing selected soil samples for:
 - o Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc)
 - o Polycyclic Aromatic Hydrocarbons (PAHs)
 - o Total Recoverable Hydrocarbons (TRH)
 - o Benzene/Toluene/Ethylbenzene/Xylene (BTEX)
 - o Organochlorine Pesticides (OCPs) and Organophosphate Pesticides (OPPs)
 - o Phenols
 - o Polychlorinated Biphenyls (PCBs)
 - o Asbestos
 - o pH
 - o CEC
 - o Clay content.

1.4. Published guidelines and framework

This report has been prepared with reference to the following publications:

- DECC NSW (2009) Guidelines for Implementing the Protection of the Environment Operations (Underground Petroleum Storage Tanks) Regulation 2008
- NSW Government (2008 version revised 2014) Protection of the Environment (Underground Petroleum Storage Systems) Regulation 2014 (UPSS Regulation)
- NSW EPA Draft Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (2014)
- DECC NSW Contaminated Sites Guidelines for the NSW Site Auditor Scheme [2nd edition] (2006)
- DECC NSW Guidelines for the Assessment and Management of Groundwater Contamination (2006)
- NEPC National Environment Protection Council (Assessment of Site Contamination) Measure, Schedule B(1) Guidelines on Investigation Levels for Soil and Groundwater (1999) (Updated 2013)
- NSW EPA and Department of Urban Affairs and Planning, Planning Guidelines SEPP 55 – Remediation of Land (1998)
- ANZECC/ARMCANZ Australian and New Zealand Guidelines for Marine Water Quality, 95% Trigger Values (2000).

2. SITE INFORMATION

2.1. Site location and setting

The location of the site within a regional context is presented in **Figure 1** in **Appendix A**. At the time of the investigation the majority of the site had been largely cleared of vegetation with the exception of a number of individual large trees sited generally along the site perimeter, and an area at the eastern end of the site, referred to as the 'retained vegetation zone' (RVZ).

The site contains two areas of former residential dwellings, generally occurring either side of Bantry Bay Road. All buildings were demolished prior to commencement of the Stage 1 site clearance and preparatory works, however some slabs and pavements remained intact. Most of the building materials had been cleared from site with temporary soil and spoil piles remaining. Areas where ACM had been observed on the ground surface were cordoned off with no admittance permitted.

2.2. Site description and land zoning

The site is approximately rectangular in shaped and covers an area of 290 m x 230 m bounded by Frenchs Forest Road West to the north, Wakehurst Parkway to the east (note there is an intervening road reserve of about 20 metres width), Warringah Road to the south and The Forest High School to the west. Bantry Bay Road is situated across the entire length of the site from north to south through the eastern section of the site.

The hospital site is completely owned by the Health Administration Corporation (HAC). The legal description is as follows: Lots 1–11, DP 26087; Lots 11–15, DP 792918; Lot 1, DP 119383. HI is currently in the process of amalgamating all acquired parcels of land into a consolidated lot.

Table 2.1 Site legal description

Former Sites	Legal Description	Description Herein
1, 3, 7, 11, 13, 15 & 17 Bantry Bay Road 7 & 9 Frenchs Forest Road	Lots 1-11 in Deposited Plan 26087	Eastern Area - Former Residential
Bushland surrounding the above residential properties	Lot 1 in Deposited Plan 119383	Eastern Area - RVZ
22, 24 & 26 Bantry Bay Road	Lots 12, 13 & 14 in Deposited Plan 792918	Western Area – Former Residential/ Commercial
Surrounding bushland	Lots 11 and 15 in Deposited Plan 792918	Western Area – Former Bushland
Bantry Bay Road	Bantry Bay Road	Bantry Bay Road

The site is located in the Warringah local government area (LGA) and the current zoning under the *Warringah Local Environmental Plan 2011* is as follows:

- R2 Low Density Residential
- RE1 Public Recreation
- SP2 Infrastructure.

2.3. Adjacent land uses

- North: Residential housing across Frenchs Forest Road
- South: Warringah Road then commercial
- East: Wakehurst Parkway then bushland

- West: The Forest High School.

2.4. Surface conditions

Site surface features and site conditions at the time of investigation are described as follows:

Eastern Area - Former Residential	This area of vacant land formerly contained residential dwellings that have since been demolished. The area currently contains building slabs and associated demolition rubble (above ground structures only). At the back of former residence 5 Bantry Bay Road, a swimming pool was uncovered that had been backfilled with building rubble including ACM, concrete, bricks and tiles.
Eastern Area – RVZ	This area of land has recently been cleared of small trees, vines and undergrowth. Several large trees remain in the area.
Western Area – Former Residential/ Commercial	The Stage 1 site clearance and preparatory works site office and car park is located in this vicinity which is where a former Community Health Centre was located. The original asphalt car park is still in place. A gravel road base has been placed on the ground around the outside of the temporary sheds.
Western Area – Former Bushland	This area of land is unoccupied and has been cleared of almost all vegetation.
Bantry Bay Road	The northern section of Bantry Bay Road traverses the middle of the site creating two subareas within the site. Pedestrian access has been maintained along the eastern side of Bantry Bay Road and the two areas of land are separated by temporary fencing.

Site features have been photographed and are presented in **Appendix F**.

2.5. Topography and landforms

A ridge runs east-west through the central section of the site. To the west of Bantry Bay Road the site slopes in a south easterly direction with an average fall of about five degrees, with the exception of the northern area adjacent to Frenchs Forest Road which falls towards the north-east. To the east of Bantry Bay Road the site slopes about 5–10 degrees in a north-easterly direction. It is noted that the south-eastern corner, south of the ridge the site slopes in a south-easterly direction.

2.6. Vegetation

To the west of Bantry Bay Road, the site has largely been cleared of all vegetation with the exception of some trees along the site boundary. The eastern side of Bantry Bay Road has been selectively cleared with a number of mature trees retained within the RVZ.

2.7. Geology

According to the Sydney 1:100 000 Series Geological Sheet, the site is underlain by the Hawkesbury Sandstone Formation, which comprises quartzitic sandstone with minor shale lenses. In the location of the site, the sandstone is overlain by a bed of shale and laminate up to nine metres thick, which is also part of this formation. The shale is said to have been deposited in abandoned meanders and channels of the braided stream system of the Hawkesbury Sandstone. This depositional environment may explain the variability of the rock observed in the boreholes, where siltstone, shale and sandstone layers alternate in discordant sequences.

As the site is located on the top of a broad ridge there are no transported soils on site. At surface the shales have weathered to stiff clays with the depth of weathering extending to between one metre and 3.5 metres. The underlying bedrock is fresh to weakly weathered.

2.8. Hydrology and hydrogeology

Surface water across the majority of the site is likely to flow south in accordance with the general topography of the site and general area. Stormwater from the site is likely to drain via the stormwater network to Middle Harbour situated approximately two kilometres south of the site, and Manly Dam situated approximately one kilometre to the southeast.

Groundwater levels were monitored between November 2012 and June 2013 at eight monitoring piezometers located onsite. The depth to groundwater ranged between 4–10 metres below top of casing, with the average Relative Level (RL) recorded across the site at 152.83 mAHD.

Previous environmental studies contained within the Groundwater Factual Report (SMEC 2013) indicate the groundwater flow direction is south-east towards Middle Harbour and Manly Dam. It was also determined that there are two distinct water table elevations, one in the shale and another in the sandstone, which are separated by around two metres.

3. SITE HISTORY AND OBSERVATIONS

3.1. Review of previous site investigation reports

On the basis of information provided by HI, it is understood that the key existing information for the site comprises:

- Preliminary Site Contamination Assessment, Proposed Frenchs Forest Hospital, Corner of Wakehurst Parkway and Warringah Road, Frenchs Forest NSW', Ref: ENAURHOD04125AA, prepared by Coffey 22 March 2011
- Report on Phase 1 Contamination Assessment with Limited Sampling, Proposed Northern Beaches Hospital, Corner of Wakehurst Parkway and Warringah Road Frenchs Forest, prepared by DP, July 2012
- Report on Standpipe Piezometer Installation, Proposed Northern Beaches Hospital, Corner of Wakehurst Parkway and Warringah Road Frenchs Forest, prepared by DP, April 2013
- Northern Beaches Hospital Groundwater Factual Report, prepared by SMEC September 2013.

These reports were reviewed prior to the site investigation. A summary of the reports is presented as follows.

3.1.1. Coffey March 2011, Preliminary Site Contamination Assessment

The Preliminary Site Contamination Assessment was a desktop study only. Coffey (2011) identified a low likelihood of contamination, with former residential properties presenting the greatest potential for concern. It was recommended that soil sampling and analysis for the contaminants of concern, namely asbestos, lead and pesticides be undertaken. It was noted that between 2008 and 2010, a series of hazardous materials surveys were undertaken on the residential buildings along Bantry Bay Road and Frenchs Forest Road.

3.1.2. DP July 2012, Phase 1 Contamination Assessment with Limited Sampling

The Phase 1 Contamination Assessment comprised the drilling of 31 boreholes to depths ranging between 1.5 –13.8 metres. The boreholes targeted the areas of environmental concern identified in the Preliminary Contamination Assessment. Thirty-nine samples were collected and analysed for metals, BTEX, TRH, PAHs, OCP, OPP, PCBs, phenols and asbestos.

In summary, all laboratory results for the analysed soil samples were within the adopted site assessment criteria. The one material sample and other selected surface soil samples all recorded laboratory results which were negative for the presence of asbestos.

DP recommended the developed lots be cleared by an occupational hygienist during demolition/earthworks and concluded that the site was compatible with its proposed use as a hospital.

3.1.3. DP April 2013, Standpipe Piezometer Installation

The Standpipe Piezometer installation comprised the drilling of four bores to depths ranging between 8–15 m bgl. Two bores were located along the western boundary, one bore on the western side of Bantry Bay Road and one bore on the eastern side of Bantry Bay Road.

3.1.4. SMEC September 2013 Groundwater Factual Report

Installation of the groundwater monitoring network was undertaken by DP during the geotechnical program in 2012 and during the additional piezometer installations (DP 2013). The network comprises a total of nine monitoring bores. It is noted that installation of the March 2013 bores were

not supervised by a geotechnical engineer; as such the drilling and construction details were not verified by SMEC.

On eight occasions between November 2012 and June 2013 groundwater levels at the available monitoring bores were measured using an electronic dip meter to the top of casing. Groundwater samples were collected for analysis on 27 March 2013 and 19 June 2013. Groundwater loggers were installed in six of the nine monitoring bores.

On 4 March 2013, SMEC personnel were present at the drilling of one of the new monitoring piezometers by DP. The work was undertaken by Ground Test and it was observed that the drillers used hydrocarbon-based grease on the drilling rod.

The analytical laboratory results for March 2013 and June 2013 indicated no pesticides, PCBs or hydrocarbons were detected in the sampling rounds with the exception of PZ01 where 22 µg/L of Total Recoverable Hydrocarbons C6-C10 was detected in March 2013. The June 2013 sample in PZ01 did not detect any hydrocarbons and the detection is likely due to contamination from hydrocarbon-based grease used during drilling.

It should be noted the data obtained during this factual report (i.e. slightly elevated heavy metals) was not compared to any site assessment criteria that would be relevant in terms of a contamination assessment.

The above conclusions are based on the type of water, i.e. sodium-chloride type and the fact that the groundwater on site would pose an issue for concrete and steel structures with high chloride and low pH levels recorded.

3.2. Site inspection

Following the review of the previous investigation reports, SMEC environmental scientists conducted a site inspection on 1 October 2014. The purpose of this was to identify areas of potential environmental concern including:

- Disturbed ground
- Asbestos fragments on ground surface
- Waste disposal including domestic rubbish, building rubble, and ACM
- Stained or odorous soils
- Unnatural changes in vegetation (including evidence of cleared ground or vegetation potentially impacted by contamination)
- The location of site structures including evidence of potential underground structures
- Potential human and environmental receptors that could be exposed to contaminants
- Historical groundwater monitoring well locations at the site
- To validate observations made in the previous investigation reports.

Site observations

Notable site observations are presented in Table 3.1 (following page). The associated site photographs are provided in **Appendix F**.

Table 3.1 Field observations

Site	Observations
Eastern Area - Former Residential	The land contains a stockpile of concrete, with brick footings, brick cellar walls and concrete swimming pool structures remaining below ground level. There are several pieces of asbestos ACM visible across the surface of this former residential area. ACM has also been identified at the base of concrete slabs currently stockpiled on site.
Eastern Area - RVZ	Several pieces of ACM and other domestic waste such as scrap metal objects are visible on the surface in this area.
Western Area – Former Residential/ Commercial	All buildings have been demolished and removed and replaced with demountable site sheds. The site is bounded by temporary fencing.
Western Area – Former Bushland	Several stockpiles of material were located around the site including mulch, organic tree waste, and VENM recently excavated for service trenching works.
Bantry Bay Road	This parcel of land contains several underground services including communication cables, optic fibres, high pressure gas and sewer.

3.3. Site history summary

3.3.1. Aerial photography

The findings of a review of aerial photographs by DP (July 2012) are summarised below:

- 1943 – The site is bushland with a few houses and small structures on it. Bantry Bay Road present
- 1951 – Bushland is more sparse
- 1965 – Bushland on eastern side of Bantry Bay Road is cleared with 11 houses present
- 1986 – Clearing for construction of health care building on the western side of Bantry Bay Road, corner of Warringah Road
- 1994 – Bushland on western side of site subject to fire. Residential houses still present
- 2002 – Bush regeneration on western side with no other changes
- 2012 – All buildings demolished with exception of Community Health Centre on the corner of Warringah and Bantry Bay Roads.

The aerial photos presented in the DP appendix were reviewed and it was noted the 1978 photo was not summarised. A clearing and potential concrete slab is evident in the 1978 aerial photo along the bush track leading from Frenchs Forest Road to the centre of the bushland on the western side of Bantry Bay Road.

Disturbed ground is evident in the 1951 photo in the south east corner of the site indicating potential burial activity.

The residential block with the swimming pool is evident in the 1994 photo. The bushland behind the swimming pool appears significantly cleared of all vegetation. (Note, intrusive ground investigations have since identified this area as buried rubbish fill).

3.3.2. Land title search

A summary of historical land title information indicated portions of the site have been owned by various individuals whose occupations range across several sectors of the community including orchardists for the majority of the period between 1906 and 1959. The NSW Government owned the majority of the site to the west of Bantry Bay Road since the Minister for Public Works (for the Manly

District Hospital) took ownership in 1960. HAC acquired Lots 1-11 in Deposited Plan 26087 between 2006 and 2007. Lot 1 in Deposited Plan 119383 and Lot 11 in Deposited Plan 26087 were owned by Warringah Council until recent acquisition by HAC.

3.3.3. License To keep Dangerous Goods

A search of WorkCover NSW License to Keep Dangerous Goods did not locate any records. An online search of the NSW EPA Contaminated Land Register did not identify any notices for the site.

4. CONCEPTUAL SITE MODEL

4.1. Conceptual site model overview

The conceptual site model (CSM) for the Phase 2 investigation is made up of:

1. Contaminants of Concern (CoCs)
2. Receptors that could be exposed to the CoCs
3. The exposure pathways between the CoCs and the receptors.

4.2. Potential sources of the contamination

On the basis of historical records, previous investigations conducted at the site and a site inspection, the most likely sources of contamination within the site comprise:

- Spray drift from pesticides used on neighbouring orchards historically located to the west of the site
- Previous storage areas, both above ground (sheds) and below ground (cellars)
- Uncontrolled fill in former backfilled swimming pool and cellar
- Stockpile of concrete containing ACM and other building materials
- ACM fragments on ground surface
- Potential use of fill across the site.

4.3. Potential contaminants of concern

Based on the desktop review and site inspection, potential chemicals of concern included:

- Heavy metals, including arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), nickel (Ni), lead (Pb) and zinc (Zn)
- Total Petroleum Hydrocarbons (TPH)
- Total Recoverable Hydrocarbons (TRH)
- Benzene, toluene, ethylbenzene and xylene (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Polychlorinated biphenyls (PCBs)
- Organochlorine pesticides (OCPs)
- Organophosphorus Pesticides (OPPs)
- Phenols
- Asbestos.

4.4. Potential receptors

Based on the information available, the potential receptors comprise:

- Transient users of the site, including unauthorised members of the public
- Future users of the site
- Future amenity planting areas in public open spaces
- Site personnel involved in the Stage 1 site clearance and preparatory works and the Stage 2 development
- Local residents
- Flora and fauna in areas surrounding the site
- The aquatic ecosystems of Middle Harbour and Manly Reservoir.

4.5. Exposure pathways

The pathways of exposure consist of:

- A transport mechanism
- A route of exposure.

At this stage of the investigation, it is likely that the exposure pathways include:

- Groundwater transport and exposure by ingestion
- Surface soil contamination and exposure by ingestion, dermal contact or inhalation
- Air transport of particulates (dust) or volatiles and exposure by inhalation.

4.6. Persistence in the environment

The potential contaminants of concern identified which have a relatively high degree of persistence in the environment are:

- OCPs and OPPs
- Arsenic and lead
- Asbestos
- Some PAHs
- Longer chain hydrocarbons (ie >C29).

5. SITE ASSESSMENT CRITERIA

5.1. Investigation levels

Assessment criteria for the soil groundwater analytical results are discussed below. Evaluation against assessment criteria is used to identify levels of contamination that may pose ecological or health risks to potential receptors or future users of the site.

It is noted that a new, amended National Environment Protection (Assessment of Site Contamination) Measure (NEPM) has been approved by all Australian States. The NEPM was first published in 1999, and updated in 2013 by the National Environment Protection Council (NEPC) and provides national standards for a variety of environmental issues, including the assessment of site contamination in Schedule B(1) *Guideline on Investigation Levels for Soil and Groundwater*.

In terms of Groundwater Investigation Levels (GILs), the 2013 version of the NEPM references *Australian and New Zealand Guidelines for Fresh and Marine Waters*, Australian and New Zealand Environment and Conservation Council /Agricultural and Resource Management Council of Australia and New Zealand (ANZECC/ARMCANZ 2000).

5.2. NEPM overview

The relevance of Health Screening Levels (HSLs) and Ecological Screening Levels (ESLs) depends upon potential petroleum hydrocarbon contamination and is applied for the purpose of human and ecological risk assessment. HSLs also consider vapour intrusion for chemicals in groundwater, and soil-vapour (ie. can be used for non-petroleum sources).

HSLs are more complicated than traditional 'one Health Investigation Levels (HIL) fits all.' Site-specific conditions are considered to a greater extent resulting in better informed decision-making and potential cost savings at remediation stage.

Considerations for assessment of site contamination include:

- The results of the CSM should inform the selection and application of human health and ecological screening levels and management limits. Relevant HSLs, GILs, HILs and Ecological Investigation levels (EILs) (e.g. PAHs and lead) should be considered for sites affected by petroleum hydrocarbons
- The limitations of the screening levels and investigation levels should be considered on a site-specific basis
- Petroleum hydrocarbon 'management limits' are used to consider the potential effects of Light Non-Aqueous Phase Liquid-related hazards
- The potential for groundwater contamination and impacts on receptors including groundwater resources should be considered and assessed as appropriate in accordance with jurisdictional policies for the protection of groundwater resources.

Fundamentally, the NEPM approach is that exceedance of management limits indicates a need to review the CSM and site data, assess the relevance of the management limits to site conditions and undertake a site-specific assessment of physical and aesthetic risks (including but not limited to the presence of NAPL). Then manage these risks as appropriate.

5.3. Health screening levels and health investigation levels

In accordance with NEPM (2013), to determine whether the health-based screening levels are applicable or whether a site specific determination was required, the application checklist was considered.

HIL and HSL are defined as ‘the concentration of a contaminant above which further appropriate investigation and evaluation will be required’. They are defined for specific land uses and will not necessarily be protective for other land uses. There are a number of assumptions (for example, relating to site geology or the nature of exposure) built into the HILs and HSLs, and careful review should be undertaken to determine whether these assumptions are applicable on a given site. The absence of a HIL for a specific contaminant does not indicate that no potential risk is posed; rather that a site-specific risk assessment may be required.

HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or ‘screening’) of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings:

- HIL A – residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children’s day care centres, preschools and primary schools
- HIL B – residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- HIL C – public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- HIL D – commercial/industrial such as shops, offices, factories and industrial sites.

The most relevant NEPM (2013) land use settings for HILs for the NBH site are considered to be HIL C and HIL D.

Appropriate NEPM (2013) scenarios for HSLs for the NBH site would be either of the following:

- HSL C – Public open space such as parks, playgrounds, playing fields, secondary schools and footpaths
- HSL D – Commercial/industrial includes premises such as shops, offices, factories and industrial sites.

If communal car parks or commercial properties occupy the ground floor, HSL D should be used in terms of vapour intrusion. In the absence of specific knowledge of the proposed building plan for the site, HSL D is the more conservative of the two land use settings and has been adopted as the most suitable HSL.

5.3.1. Soil

In view of the proposed land use as a ‘commercial building’ (as per the above discussion), the adopted assessment criteria for assessing the soil contaminants have been sourced from:

- NEPM (2013) Soil HSLs for vapour intrusion for commercial/industrial (HSL D)
- NEPM (2013) Health Investigation Levels (HILs) for selected organic and inorganic chemicals for Commercial/Industrial (HIL D) sites
- NEPM (2013) Management Limits for TPH analytical results.

5.3.2. Groundwater

HSLs are not provided for groundwater less than two metres below ground level and so a site specific risk assessment should be considered. However, it is considered unnecessary to derive site-specific HSLs for groundwater for the following reasons:

- The groundwater HSL for vapour intrusion for BTEX and TPH C6-C10 and >C10-C16 for commercial industrial (ie Table 1A(4)) are all ‘not limited’ (NL, i.e. cannot exist in concentrations high enough to cause unacceptable risk to health, for scenarios where groundwater is at a depth

of 2 m bgl or greater apart from benzene and TPH C6-C10 where the lowest HSLs are 5,000 µg/L (benzene) and 6,000 µg/L (C6-C10)

- All of the chemical analytical results are below the laboratory estimated quantitation limit (EQL) for the HSL chemicals
- All of the hydrocarbon analytical results are below the EQL
- There are no primary sources of petroleum hydrocarbons at the site, and the nearest service station is located approximately 40m down gradient, across Warringah Road.

As there is no primary source and the analytical results are all reported as being below the EQL with the exception of low concentrations of TPH C₆-C₁₀ detected during the first round due to contamination from the hydrocarbon-based grease used during drilling, it is not considered that hydrocarbons could give rise to an unacceptable risk for the 'commercial/industrial' land use scenario. Other criteria have been determined for the assessment of groundwater as discussed in Section 5.1.

5.4. Ecological screening levels for metals and other contaminants

5.4.1. Overview

Given that limited information on the proposed areas for public open space and amenity planting was not available at the time of preparation of this report, the EILs applied should be considered preliminary and do not constitute a full ecological risk assessment (ERA). For a site-specific ERA the nature of receptors need to be known, including proposed public open spaces and amenity planting areas.

In the absence of specific information regarding the proposed landscaping of the site, EILs for 'urban residential and public open space' rather than EILs for 'commercial/industrial' have been selected as the more conservative criterion in this instance.

5.4.2. Ecological investigation levels

- Analytical results will also be compared with the NEPM (2013) provisional phytotoxicity-based Ecological Investigation Levels (EILs) to determine potential risks to current and future ecological receptors at the site for select analytes (As, DDT, Pb, naphthalene, Cr, Cu, Ni, Zn)
- For other analytes potentially phytotoxic to plants, the NEPM 1999 provisional phytotoxicity based investigation levels (PBILs) have been referenced
- The NEPM (2013) EIL values rely on site-specific inputs and calculations, whereas the NEPM (1999) PBILs are indicative concentrations aimed at protecting plant health and were derived specifically for sandy loam soils or soils of a closely similar texture with a pH in the range of 6–8; they are intended for assessment screening purpose only
- Having consideration for site specific EIL calculation and known historical factors, soils present on site are considered 'Aged', ie >2years in current landform
- The future hospital site is considered 'commercial/industrial' land use, with public open space landscaped areas; therefore having consideration for specific EIL calculations, the more conservative NEPM (2013) 'urban residential and public open space' land use criterion has been applied for preliminary screening purposes.

5.4.3. Ecological investigation levels

- Ecological Screening Levels (ESLs) are relevant in terms of petroleum-impacted soils where ecological receptors are present; the ESLs presented in Table 1B(6) of the NEPM (2013) are compared against various land uses for fine or coarse soil textures

- For the purpose of this investigation TPH fractions will be compared to fine soil texture for commercial and industrial land use.

5.5. Guidelines for protection of aquatic ecosystems

- Site specific considerations for selecting groundwater investigation levels for protection of aquatic ecosystems should be considered in terms of:
 - o Drinking Water (Australian Drinking Water Guidelines (NHMRC & NRMCC, 2004)
 - o Aquatic ecosystems (ANZECC & ARMCANZ, 2000)
- The nearest major water bodies are Middle Harbour situated about two kilometres south of the site, and Manly Dam situated about one kilometre to the southeast
- The trigger values applicable to the protection of aquatic ecosystems are the ANZECC Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000) for toxicants in freshwater for the protection of 95% of species.

5.6. Potential groundwater receptors

The receptors that could potentially be exposed to contaminated groundwater include:

- Persons using groundwater as drinking water – through the extraction of groundwater from offsite bores for human and/or livestock drinking water purposes (noting that the area surrounding the site is largely residential and commercial land use)
- Persons using groundwater for irrigation purposes – through the extraction of groundwater from offsite bores
- Aquatic ecosystems in freshwater surface water bodies.

5.7. Adopted soil assessment criteria

The adopted soil assessment criteria for the site are provided in **Table C1 of Appendix C** and are summarised as follows:

- NEPM (2013) HILs for organic and inorganic chemicals
- NEPM (2013) ESLs, HSLs and MLs for TPH
- NEPM EILs (2013) /PBILs (1999) for phytotoxicity.

5.8. Adopted groundwater investigation levels

The adopted groundwater investigation levels (GILs) for the site are shown in **Table C2 of Appendix C** and are summarised as follows:

- Laboratory EQLs as screening levels for hydrocarbons
- NEPM (2013) groundwater investigation levels for Freshwaters, sourced from ANZECC (2000) for typical slightly to moderately disturbed aquatic ecosystems (protection of 95% freshwater species) for lead, benzene, naphthalene and xylene
- ANZECC (2000) low reliability trigger value sourced from Table 8.3.14 (ANZECC 2000) for toluene and ethylbenzene.

5.9. Aesthetic criteria

Soils shall not be discoloured or affected by odours to an extent that this would be considered a hazard or nuisance.

5.10. Asbestos criteria

If ACM is identified on the ground surface or in fill material during the Phase 2 investigation, the location will be recorded with a GPS and the presence will be managed in accordance with NEPM (2013) which draws upon experiences of the WA Department of Health (2009) *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (referred to herein as the WA Guidelines). The adopted site screening level in accordance with NEPM (2013) includes no visible asbestos for surface soil.

6. DATA QUALITY OBJECTIVES

6.1. Objective

The Data Quality Objective (DQO) process for this project has been derived from the NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme* (2nd Edition) and the NEPM 1999 (2013) *Guideline on Site Characterisation*. The DQO process is a seven-step process that assists in the development of sampling programs that support decision-making. The DQO process is described as follows with regard to the proposed remediation and validation works on the site.

6.2. Step 1 – State The Problem

6.2.1. Problem definition

Between 1906 and 1959 land use to the west of the site was agricultural (orchards). Since about 1960, the site comprised residential properties in the eastern half while bushland was cleared and re-established in the western half. No specific observable activity occurred in these locations considered likely to give rise to potential contamination.

6.2.2. The planning team

The initial team has been selected to work together through the seven steps of the project DQO process. However, as the DQO Process is iterative, additional team members may be added to address areas of expertise not initially considered.

- Senior Environmental Scientist – Penelope Ford (SMEC)
- Hydrogeologist – Cara Jacques (SMEC)
- Senior Environmental Scientist – Daniel Saunders (SMEC).

6.2.3. Decision-makers

The major decision-makers are shown in Table 6.1 below.

Table 6.1 Major decision makers

Name	Organisation	Role
Julian Cook	Johnstaff	HI – Project Manager
Chris Masters	SMEC Australia	SMEC – Project Manager
Jason Pfeiffer	Donnelly Constructions	Primary Construction Contractor
Daniel Saunders	SMEC Australia	SMEC – Senior Environmental Scientist

6.2.4. Technical staff and data users

The personnel required for remedial works, data analysis and reporting are identified as follows:

- Earthworks Contractor: Simmons Civil Contracting Pty Ltd
- Contamination: Penelope Ford (SMEC)
- Groundwater: Cara Jacques (SMEC)
- Site Contamination Management: Daniel Saunders (SMEC)
- Project Manager: Chris Masters (SMEC Australia)
- Technical Review: Daniel Cramer (SMEC).

6.2.5. Stakeholders

Stakeholders are individuals and organisations that are directly affected by a decision, interested in a problem, and want to be involved, offer input, or seek information. The involvement of stakeholders early on in the DQO process can provide a forum for communication as well as foster trust in the decision making process. At this stage it is envisaged that communication is limited to staff and individuals directly involved in the project.

Future communication and consultation may include the following stakeholders:

- HI, Hospital Operator
- The Forest High School
- Local residents
- Indigenous land owners
- NSW Environment Protection Authority (EPA).

6.3. Step 2 – Identify The Decision

The purpose of this step is to define the decision statement that the Phase 2 investigation will attempt to resolve, based on the problem stated above, and further ahead in Section 6.4.1. The principal study objective can therefore be summarised as:

To assess the potential risks posed by contamination and obtain sufficient data to allow the development of strategies to remediate and/or manage the contamination.

Questions arising from the principal study objective include:

- What is the likely concentration (mass) and vertical and lateral extent of contamination in soil and surface and groundwater?
- Identification of the types of contamination
- Assess the risks of unknown contamination being present at the site
- Identify (if possible) the source(s) of contamination
- Determine whether the concentrations of contaminants at the site are significantly above background levels
- Determine whether the concentrations of contaminants exceed the adopted site assessment criteria
- Determine the mobility and fate of contamination
- Determine the migration potential of the contaminants of concern
- Determine the pathways of exposure of the contamination to humans, the environment and Defence operations
- Determine whether contaminants pose a human health or ecological risk to the receptors of concern
- Determine whether contamination is affecting the potential future land use at the site
- Do construction activities have the potential to impact on soil and groundwater?
- Does soil or groundwater contamination have the potential to impact on construction activities?
- Determine the requirements for ongoing environmental management (if any).

6.4. Step 3 – Identify The Inputs to the Decision

6.4.1. Introduction

The primary inputs required to be measured by the investigation are:

- Assess in greater detail areas of environmental concern

- Assess in greater detail the current site conditions (ie topography, hydrogeology) and their potential to influence the migration of contamination
- Aesthetic impacts in surface and deeper soils caused by contamination, including staining, odours and visible asbestos
- Determine data on the background quality of surface water, soils and groundwater at the site
- Determine the nature and extent of contamination at critical areas of the site (including the depth of contamination below the surface)
- The migration potential of contamination (if any) at the site
- The toxicity of the contaminants and their persistence
- Assess the results of previous investigations, the observations made during the remediation works and historical data
- NSW EPA and NEPC endorsed adopted site assessment criteria.

The following sections more specifically identify the DQOs associated with key fieldwork components of the investigation works.

6.4.2. DQO Decision Inputs

Purpose and required information

The purpose of the Phase 2 investigation program is to demonstrate that potential contaminants of concern are at an acceptable level appropriate for the proposed land use of the site.

The information requirements can be divided into two primary areas:

1. Fieldwork information requirements
2. Documentation requirements

Fieldwork information requirements are:

- Maps of the investigation works
- Survey information on the sampling locations
- Information on the nature of materials encountered during Phase 2 investigation works
- Field screening of soils including visual inspection of subsurface soils and the use of PIDs where required
- Photographic logs of residual soils
- Collection of representative soil samples in accordance with NSW EPA endorsed criteria, for chemical analysis at NATA accredited laboratories.

Documentation requirements:

- NATA accredited laboratory reports
- NSW EPA approvals (if required)
- Waste classification letters (if required)
- Waste tracking documentation (if required).

Information sources

- Results of previous investigations including contaminant concentrations
- Survey information relating to land title information
- Civil Contractor documentation of site works.

Determining the action level

Field screening of soil samples, based upon:

- PID screening results
- Visual or olfactory evidence of contamination.

Frequent communication with the Civil Contractor (Simmons Civil) and Contract Administrator (Donnelly Constructions) will be maintained to ensure that the required information is documented and collected.

6.5. Step 4 – Define The Study Boundaries

The study boundaries include spatial and temporal boundaries of the site. These have been divided into the following descriptors:

- Target media
- Geographic boundaries – spatial extent as shown on **Figure 2** in **Appendix A**
- Temporal boundaries
 - o sampling limitations (e.g. laboratory hold times for analyte tests)
 - o the availability of previous investigation data
 - o potential inaccessible areas

6.5.1. Target media

The target media for this study comprises the environmental samples of:

- Surface and subsurface soils
- Groundwater.

Decision-makers will base assessment and management decisions on information gained from these target populations.

The conditions of these media will be compared to the adopted site assessment criteria to determine the response to the principal study question.

6.5.2. Geographic boundaries

The geographic boundaries (spatial extent) of the data collection and decision making process for this project are shown in **Figure 2** in **Appendix A**, and comprises the following investigation areas:

- The land boundaries of the NBH site owned by HAC, defined as Lots 1–11, DP 26087; Lots 11–15, DP 792918; Lot 1, DP 119383
- The potential receptors as defined in **Section 4.4** will be considered in the decision-making process.

6.5.3. Temporal boundaries

The temporal boundaries included in the decision making process are the persistence of potential contaminants of concern in the environment and the stability of potential groundwater contamination plumes.

6.6. Step 5 – Develop A Decision Rule

Key drivers

The following outlines the key drivers and relevant decision rules that will be applied in the decision making process:

- Assess whether available data meets the minimum sampling requirements as per NEPM 2013

- Assess whether the data collected meets the limits on decision errors as outlined in **Section 6.7.4**
- Assess the need for remediation and/or management controls if contamination is found to exceed the adopted site assessment criteria
- The health and safety of current and future users of the site
- Potential impacts to Middle Harbour or other surface water bodies
- Potential impacts to groundwater.

The analytical and field data generated from the sampling and analysis will be compared to the adopted site assessment criteria (refer to Section 5), and the decision rules will be as follows.

Soils:

- If individual contaminant concentrations in soils are greater than adopted soil investigation levels, then compare concentrations to 250% hotspot criteria
- If individual concentrations are greater than 250% hotspot criteria, then consider further characterisation or remedial works
- If individual concentrations are less than 250% hotspot criteria, then include in 95% UCL calculations and Standard Deviation calculations:
 - o If 95% UCL is less than adopted site assessment criteria and Standard Deviation is less than half the assessment criteria, then further characterisation is unlikely to be required
 - o If 95% UCL is greater than adopted site assessment criteria and Standard Deviation is greater than half the assessment criteria, then further characterisation is likely to be required
- If individual contaminant concentrations in soils are less than adopted soil investigation levels then further characterisation is unlikely to be required

Groundwater:

- If contaminant concentrations are greater than adopted GILs then compare results to background levels. If contaminant concentrations exceed both GILs and background levels then consider further characterisation such as geochemical monitoring parameters to determine the risk posed to the environment
- If contaminant concentrations in groundwater are less than GILs and background levels then further characterisation is unlikely to be required.

Note:

Groundwater is highly variable in quality and using the ANZECC (2000) % species protection limits for assessment of groundwater quality is only relevant if the groundwater is to be discharged to the surface environment. If groundwater is not to be discharged, but continues on a natural path to possible discharge as base flow, then the resulting quality must be assessed based on “un-natural” contamination of the groundwater which may eventually reach the discharge zone. In this instance the contaminant concentration of the naturally discharging groundwater may be assessed based on the resulting water quality after dilution. The potential receiving water body, or discharge zone is Middle Harbour located about two kilometres south east of the development site.

6.7. Step 6 – Acceptance Criteria

6.7.1. Baseline conditions

For making decisions on contamination the collected data must demonstrate whether the soil on the site and the groundwater under the site are in fact hazardous to human health and/ or the environment. To meet this requirement, the baseline condition has been established as:

- ‘The soil is contaminated’ – that is, an analyte concentration in a soil sample is at or above the soil threshold value for that analyte.
- ‘The groundwater is contaminated’ – that is:
 - The contaminant has entered, or may be foreseen to enter, groundwater, and
 - The concentration of the contaminant in the groundwater is, or may be foreseen to be, above the concentration specified for that contaminant is at or above the groundwater threshold value for that analyte
 - The concentration of the contaminant in the groundwater may be foreseen to continue to remain above the specified threshold value, or
 - Separate-phase contamination of groundwater (i.e. immiscible organic liquid), is found, regardless of the concentration of the contaminant in the groundwater.

6.7.2. Selected sampling density

The NSW EPA *Sampling Design Guidelines* (1995) state that no guidance is given for sites larger than five hectares, with such sites usually subdivided into smaller areas for more effective sampling. Therefore the site was divided into five AECs.

Table 6.2 summarises the minimum requirements for characterising contamination at each of these AECs.

Subject to the implementation of management plans during the site development, localised contamination may exist and may have remained undetected at locations other than those sampled. Protocols should be developed and put in place that ensure that such areas be identified and managed during the development of the site. This may include the supervision of earthworks by a suitably qualified professional and the recording of site conditions.

6.7.3. Decision errors

The acceptable limits on decision errors are considered during the sampling and analysis planning stage of the assessment program. For example, special consideration has been given to the tolerable limit of failing to identify potential pesticide impacted soil outside the western spray drift area.

However, even if the required number of sampling points fails to identify potential pockets of pesticide contamination, the groundwater monitoring programme has been designed to identify potentially impacted groundwater in the vicinity of the site.

Table 6.2 Summary minimum sampling requirements

	AEC	Area (m ²)	Min Sample Density	Phase 1 (DP 2012)	Phase 2 (Current 2014)	Actual total	Contaminant laydown mechanism	Comment
1	Eastern Area - Former Residential	8,225	20	22	3 (target beneath slab)	25	Contaminants in building materials impacting on surface soils	Requirement exceeded
2	Eastern Area - RVZ	11,342	22	0	12	12	Buried waste potentially impacting on deeper soils and groundwater	Minimum sampling density not required in accordance with NEPM 2013, provided the CSM informs all site assessment decisions. The lateral extent of fill was delineated using multiple lines of evidence including test pit investigations, field observations and aerial imagery. Note the outcome of this assessment would not have altered with an increased number of test pit locations in this area.
East of Bantry Bay Rd		~2 ha	30	22	15	37		Requirement achieved overall
3	Western Area – Former Residential/ Commercial	4,130	11	6	1 (target beneath slab)	7	Contaminants in former building materials potentially impacting on surface soils	Requirement not achieved. Not considered to be significant. Visually consistent, uncontaminated material.
4	Western Area – Former Bushland	28,827	39	3	47	50	Potential spray drift from neighbouring historic orchard	Requirement exceeded
West of Bantry Bay Rd		~3.3 ha	43	9	48	57		Requirement achieved overall
5	Bantry Bay Road	4,494	11	0	1	1	Migration of contaminants via groundwater or pavement built on fill material and processes in other areas	Requirement not achieved due to safety issues (live services in the roadway). Further investigation is not considered necessary but the Hospital Operator should satisfy themselves in this regard.

6.7.4. Data quality indicators

The Tolerable Limits of Decision Errors establishes the Data Quality Indicators (DQIs), by which the data collected during the investigation is measured. The DQIs are summarised as follows.

Data representativeness:

- Use of appropriately trained field personnel to collect data and investigate site conditions.
- Careful soil logging to confirm the nature and depth of impact.
- Groundwater sampling in accordance with 'best practice' low flow groundwater sampling techniques

Documentation and data completeness

- Site conditions properly described
- Sample locations properly described and recorded on field notes/logs
- Field records appropriately completed
- Completion of calibration results, chain of custody documentation, laboratory reports from NATA registered laboratories
- Collection of representative samples from each identified potential area of environmental concern. Locations recorded to enable relocation at the completion of the project
- Samples tested for appropriate Contaminants of Potential Concern (CoPC); field parameters including olfactory assessment, and PID to be used to assist the determination of samples for analysis.

Data comparability

- Appropriate techniques are used for sample handling (including sampling, storage and transport)
- Use of NATA accredited test methods in primary laboratory using NEPM procedures
- Use of NATA accredited test methods in check/secondary laboratory using NEPM procedures.

Precision

- Field:
 - o blind duplicates to be collected at a rate of 1:20 and analysed in the primary laboratory
 - o triplicate samples to be collected at a rate of 1:20 and analysed by the check/secondary laboratory
 - o relative percentage differences (RPDs) for inorganic analytes to be less than 30%
 - o RPDs for organic analytes to be less than 50%
 - o acceptable quality of field blanks
 - o acceptable data quality control results by the laboratories are achieved
- Laboratory:
 - o analysis of laboratory duplicates at a frequency of 1:20, with a minimum of one analysed when the batch size exceeds 5 samples
 - o RPDs to be < 50% or within the laboratory acceptance criteria, typically 50% (between 1 and 10 times LOR/EQL), 0-20% (greater than 20 times LOR/EQL)

Accuracy

- Field:
 - o SMEC standard operating procedures (SOP) complied with for field works

- Laboratory analysis of:
 - *Laboratory blanks*: blank comprising reagents (compounds) specific to the analytical method and are prepared and analysed by the laboratory under the same condition as the field samples. The blank allows the measurement of potential contamination in the analysing laboratory. Typically analysed at a frequency of 1:20, minimum one per sample batch. Acceptability limit is the non-detect of contaminants of concern
 - *Matrix spikes*: spikes prepared by adding a known concentration of a contaminant into a sample which are then analysed. The amount of the contaminant (the spike) recovered is measured to assess the effect on the sample matrix on the accuracy of the analytes and the suitability of the laboratory method. Typically analysed at a frequency of 1:20, minimum one per sample batch with a spike analysed from each major soil type (natural, fill, etc). Acceptability limit 70-130%
 - *Surrogate spikes*: surrogates are used to test the laboratory method. Achieved by spiking samples with an aliquot (compounds not found in field samples) and which are then analysed using chromatographic methods. The recoveries are calculated and provide an indication of analytical accuracy. Acceptability limit 70-130%
 - *Laboratory control samples*: sample prepared by spiking an aliquot with known concentrations of an analyte. The sample is analysed and the recovery is used to assess laboratory performance. Typically analysed at a frequency of 1:20, minimum one per sample batch. Acceptability limit 70-130%.

6.8. Step 7 – Data Collection Process

As additional information is gathered during the course of the remedial works, it may be beneficial for the proposed validation sampling program to be altered from the initial design. Changes to the proposed validation sampling program will be made in consultation with HI.

The validation sampling program will be optimised by:

- Having an appropriately qualified and experienced representative observing the remediation works at all times
- Using a PID for soil gas screening
- Ensuring a dynamic field work plan that allows flexibility to locate validation samples and groundwater monitoring bores based on field observations
- Targeting sampling at the most significant areas of environmental concern at the site; and
- The assessment to be conducted in the spirit of *Contaminated Sites Sampling and Design Guidelines* (NSW EPA, 1995)
- The site will be sampled in accordance with the National Environment Protection (Assessment of Site Contamination) Measure [NEPM (2013)]
- Target locations under former slabs in the residential areas will be sampled
- The selected sampling density is a combination of minimum sampling requirements and target locations.

Ten geotechnical boreholes were installed during the current investigation. Soil logging information obtained from the soil profile during geotechnical investigations was utilised during soil sampling.

7. SITE INVESTIGATION AND METHODOLOGY

7.1. Background

The objective of the investigation is to assess the risks posed by any contamination given the proposed use of the site as a hospital.

The work has been undertaken in accordance with the Job Safety and Environmental Analysis (JSEA) Plan to manage the potential risks to human health and safety associated with the fieldwork.

All fieldwork was undertaken by suitably qualified, trained and experienced personnel.

7.2. Sampling design requirements

The sampling design for the site was developed to target specific AECs on the basis of the existing information regarding spray drift associated with potential pesticide use at former neighbouring orchards and the location of concrete slabs on residential blocks.

Drilling and sampling was undertaken at 59 test pit and five borehole locations to depths ranging from 0.1–1.0 mbgl across the site. The locations of the test pits and boreholes are presented in **Figure 2 in Appendix A**.

The location for soil sampling was selected based on:

- Previous land use as described in historical site documents
- Conclusions and recommendations made in previous investigation reports
- Field observations made during the SMEC site investigation such as surface rubbish, disturbed ground or unusual topography.

Given the NSW EPA *Sampling Design Guidelines* (1995) state that no guidance is given for sites larger than 5 ha, the site has been subdivided into two main areas – east and west of Bantry Bay Road. The total site including the asphalt road and road verges covers an area approximately 5.6 ha. As summarised in Table 6.2, a minimum of 30 systematic sampling locations are recommended to characterise a 2 ha site (ie east of Bantry Bay Road) and a minimum of 43 sampling locations to characterise a 3.3 ha site (ie west of Bantry Bay Road).

SMEC considered it prudent to include the DP Phase 1 contamination assessment locations in the adopted sampling density of 30 sample locations on the eastern side and 43 sample locations on the western side. With the combined Phase 1 and Phase 2 investigation locations, a total of 37 sample locations on the eastern side and 57 sample locations on the western side exceeded the adopted sampling densities.

Sample locations were selected to focus on former built up areas, while grid-based sample patterns also covered broad acreage post tree clearing. Several of the targeted locations were selected in areas adjacent to the old building slabs or within the footprint where these slabs had been partially removed. Additional test pits outside grid-based locations were excavated where fill or rubbish was observed protruding from the ground surface.

Therefore, with a combined total of 94 locations the site has been investigated to a level that is satisfactory (for site assessment of contamination purposes) in accordance with NSW EPA sampling density guidelines. This does not preclude the requirement for additional validation sampling where contamination was encountered and remediation or site management will be required.

7.3. Sampling and analysis plan

The SAPs for site sampling and field activities are summarised in Table 7.1 (soil) and Table 7.2 (groundwater).

Table 7.1 Sampling and analysis plan – soil

Sample ID	Type and location	AEC	No. of samples	Laboratory analysis (selected samples)
TP07-TP46, TP03A, TP11A, TP13A TP15A, TP35A, TP41A	Test pits Western side – Former Bushland	AEC4	45	Total Petroleum Hydrocarbons (TPH), Benzene/Toluene/Ethylbenzene/Xylene (BTEX), Polycyclic Aromatic Hydrocarbons (PAHs), Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) (M8), organochlorine (OCP) and organophosphate (OPP) pesticides, polychlorinated biphenyls (PCB), Phenols, Asbestos
BH01-BH04 and BH07	Geotech/ boreholes Western side	AEC4	5	TPH, BTEX, PAH, M8
TP47	Test pit Western side – Former Residential/ commercial	AEC3	2	TPH, BTEX, PAH, OCP, PCB, M8, Phenols, Asbestos
TP48A	Open trench for services – Bantry Bay Road	AEC5	1	TPH, BTEX, PAH, OCP, OPP, PCB, M8, Phenols, Asbestos
TP56, TP57, TP60	Test pit Eastern side – Former Residential	AEC1	3	TPH, BTEX, PAH, M8, Asbestos
TP53-TP55, TP54A, TP58, TP58A, TP59, TP59A, TP61, TP62, TP62A, TP63	Test pit Eastern side – Former Bushland	AEC2	14	TPH, BTEX, PAH, OCP, PCB, M8, Phenols, Asbestos

Table 7.2 Sampling and analysis plan – groundwater

Sample ID	Sample Dates	AEC	No. of Samples	CoC laboratory analysis
PZ01	24/03/2013 19/06/2013	AEC4	1	TPH, BTEX, Nutrients, M8, PAH, OCP, OPP, PAH, PCB
PZ06	24/03/2013 19/06/2013	AEC4	2	Nutrients, M8, OCP, OPP, PCB
PZ09	24/03/2013 19/06/2013	AEC1		Nutrients, M8, OCP, OPP, PCB
PZ102	24/03/2013 19/06/2013	AEC4	2	TPH, BTEX, Nutrients, M8, OCP, OPP, PAH, PCB
PZ103	24/03/2013 19/06/2013	AEC4	2	TPH, BTEX, Nutrients, M8, OCP, OPP, PAH, PCB
PZ107	24/03/2013 19/06/2013	AEC3	2	Nutrients, M8, OCP, OPP, PCB
PZ112	24/03/2013 19/06/2013	AEC1	2	Nutrients, M8, OCP, OPP, PAH
PZ24	24/03/2013	AEC1	1	Nutrients, M8, OCP, OPP, PCB
PZ31	24/03/2013 19/06/2013	AEC4	1	TPH, BTEX, Nutrients, M8, PAH, OCP, OPP, PCB

7.3.1. Soil sampling program

Boreholes were drilled by BHC Drilling Pty Ltd. Boreholes were advanced using a Multidril 308 truck-mounted drilling rig. Drilling methods adopted for the site investigation were dictated by encountered subsurface conditions. The boreholes were advanced using conventional drilling techniques, i.e. by auger drilling with tungsten carbide (TC) bit attachment.

Test pits were excavated using the client's contractor with a 21 tonne and 5 tonne excavator with a 2 m x 0.75 m wide bucket attachment to target depths between 0.1–1.0m below existing ground level.

7.3.2. Sampling depths and intervals

At each sampling location, soil samples were collected at depths of 0–0.1m (surface), 0.5 m and 1.0 m. Soil types were logged in general accordance with Australian Standards and NSW EPA guidelines. Descriptions included soil type (using the USCS) and obvious indicators of contamination such as discolouration, staining or odours.

7.3.3. Methods of soil sampling

Soil samples were collected using new disposable nitrile gloves for each sample. The soil was transferred to laboratory supplied sample jars using a stainless steel trowel, which was decontaminated with a phosphate free detergent between each sample location. A handheld PID was used to detect any VOCs within soil samples. The calibration certificate for field equipment used is presented in **Appendix D**.

7.3.4. Groundwater well installation and sampling

Important note:

At the time Phase 2 investigations commenced (October 2014) no groundwater monitoring wells remained on site as piezometers were inadvertently destroyed during tree felling and Stage 1 early works. For this reason, analytical results of the 2013 groundwater sampling event are described herein.

Installation of the groundwater monitoring network was initially undertaken by DP in June 2012 and extended in March 2013 (DP 2012, 2013). The network comprised nine monitoring bores and location details are provided in Table 7.3.

Table 7.3 Bore locations and drilling details

Bore ID	Surface RL (mAHD ¹)	Method ²	Date installed
PZ01	159.0	Unknown	Unknown
PZ06	160.0	SFA/Coring	18/06/2012
PZ09	154.8	SFA/Coring	19/06/2012
PZ24	160.8	SFA/Coring	20/06/2012
PZ31	159.8	SFA/Coring	21/06/2012
PZ112	158.0	SFA/Rotary	4/03/2013
PZ107	161.0	SFA/Rotary	5/03/2013
PZ102	160.7	SFA/Rotary	4/03/2013
PZ103	159.0	SFA/Rotary	6/03/2013

1 mAHD – metres Australian Height Datum

2 SFA– solid flight auger, Coring – diamond cored borehole, Rotary – rotary washboring,

The monitoring bores installed in June 2012 were not developed following installation and those installed in March 2013 were developed only by flushing with fresh water and hand bailing the day after installation. The March 2013 installed bores were not supervised by a geotechnical engineer; as such the drilling and construction details cannot be verified by SMEC.

Following vandalism of monitoring bores PZ01 and PZ31, PZ01 was redrilled by DP and PZ31 was rehabilitated by SMEC.

On 4 March 2013, SMEC personnel were present at the drilling of one of the new monitoring piezometers by DP. The work was undertaken by Ground Test and it was observed that the drillers used hydrocarbon-based grease on the drilling rod. No representative from DP was present for geological logging of the borehole or recording the installation. SMEC is unable to verify the geological conditions noted on the borehole logs from the March 2013 drilling.

Table 7.4 (following page) presents the piezometer construction details and interpreted screened lithology collated from the DP reports.

Groundwater samples were collected for analysis on 27 March 2013 and 19 June 2013. Groundwater levels and the potential presence of phase-separated hydrocarbons (PSH) were measured in each well using an interface probe. The potential presence of contamination was then further assessed using visual and olfactory techniques.

Table 7.4 Bore construction details and interpreted lithology

Bore ID	Total depth (mbgl ¹)	Screen interval (mbgl)	Gravel pack interval (mbgl)	Bentonite seal (mbgl)	Interpreted screened geology
PZ01	16.5	13.5–16.5	13.5–16.5	Unknown	Sandstone
PZ06	9.8	6.8–9.8	6.8–9.8	Unknown	Laminate/ Sandstone
PZ09	10.3	7.3–10.3	7.3–10.3	Unknown	Laminate
PZ24	7.8	4.8–7.8	4.8–7.8	Unknown	Sandstone
PZ31	8.0	5.0–8.0	5.0–8.0	Unknown	Shale
PZ102	8.0	5.0–8.0	4.5–8.0	3.5-4.5	Shale
PZ103	11.9	8.9–11.9	8.5–11.9	7.5-8.5	Shale
PZ107	8.1	5.1–8.1	4.5–8.5	3.5-4.5	Shale
PZ112	15.1	12.1–15.1	11.5–15.1	10.5-11.5	Shale

1 mbgl – metres below ground level

Purging of bores was undertaken on 18 March 2013 using a dedicated Waterra foot valve and tubing. Purging is designed to remove left over drilling mud fines from boreholes, develop the gravel pack and induce inflow of clean undisturbed groundwater. Groundwater bores with low yields are often purged dry and may require several purging rounds to remove fines from the gravel pack to allow collection of representative samples. Higher yielding bores are purged until the mud is removed. The bores were purged dry with the exception of PZ01.

The groundwater investigation was conducted in general accordance with the *National Environment Protection Measure (Assessment of Site Contamination) 1999* (NEPC, 2013) and *Australian Standard Guide to the Sampling and Investigation of Potentially Contaminated Soil* (Standards Australia 1999 & 2005). The methods and procedures for fieldwork, decontamination procedures and sample handling were consistent with current industry practices.

7.3.5. Decontamination procedures

The following decontamination procedures were adopted for drilling and sampling equipment:

- *Borehole augering*: in order to minimise potential cross-contamination, the auger was washed with phosphate-free detergent, then rinsed with clean water to ensure the auger was free of residual soil from the previous sampling location
- *Sampling equipment*: sampling equipment, such as trowels and interface probe were washed between sampling using phosphate-free detergent, and then rinsed with clean water.

8. SITE ASSESSMENT

8.1. Field observations

8.1.1. Soils

As the NBH site is located on the top of a broad ridge there are no transported soils on site, with the 'A horizon' generally comprising darker grey silty clay and weathered to stiff clays. Fill was identified in nine test pits to depths ranging between 0.1–1.0 m. Underlying shale or siltstone bedrock was encountered at depths ranging between 1.7–4.4 m bgl across the site. The nature of the fill varied across the site and included gravel road base fill, ash fill, and reworked natural silty clay with construction and demolition (C&D) waste, and domestic rubbish.

During borehole drilling and sampling, the soil lithology was noted along with any evidence of soil contamination such as soil discolouration and/or soil odour. A handheld PID was used to assess the potential for VOCs within soil samples. Calibration certificates for the PID are provided in **Appendix D**.

Detailed geological conditions, test pit termination depths, depth of fill, sampling point depths and PID readings can be observed in the sample register presented in **Appendix B**. Location of previous investigation bore and monitoring well locations are presented in **Figure 2**, and location of current sampling locations are presented in **Figure 3, Appendix A**.

Fill material within the elevated (south-east) section of the site was found to a depth of approximately 1.0 m BGL. The fill appeared to consist of reworked natural brown clay with buried domestic litter and C&D waste with potentially asbestos containing materials present in the form of broken bonded cement fibre sheeting present in the fill layers of the former residential area and in the APZ. Residual clays (approximately 0.5–1.0 m bgl) were encountered below the layer of fill.

Fill material within the selectively tree cleared (north-east) section of the site was found to a depth of approximately 0.6 m bgl. The fill appeared to consist of loosely capped clay to 0.2 m underlain by reworked soil with domestic litter and C&D waste. Traces of building rubble were evident on the ground surface, including ACM identified around the trunks of remaining trees.

Fill material to approximately 0.3 m bgl comprised of brick footings were encountered at two locations on the western side of Bantry Bay Road (TP15 and TP29A) and represents a low risk of cement bonded ACM occurring in this location.

No obvious odours were detected during field work activities. PID and visual assessment of soils produced comparative results to the olfactory assessment with no gross contamination or obvious hydrocarbon contamination noted. Asbestos fragments were observed at several ground locations indicated on **Figure 3, Appendix A**.

8.1.2. Groundwater

Groundwater levels were monitored between November 2012 and June 2013. The results are presented in Table 8.1 and Table 8.2.

Based on the May 2013 monitoring round water levels the groundwater flow direction is south-east towards Middle Harbour and Manly Dam (Figure 8.2). It can also be seen that there are two distinct water table elevations, one in the shale and another in the sandstone, which are separated by around two metres.

Table 8.1 Manually recorded groundwater levels (below top of casing)

Date	PZ01	PZ06	PZ09	PZ24	PZ31	PZ102	PZ103	PZ107	PZ112
TD¹	16.5	10.1	10.4	7.9	8	8.6	12.4	8.7	15.6
RL²	158.5	159	160	154.8	160.8	161	160.7	158	159.8
21/11/2012	5.8	6.16	8.31	2.93	4.66				
12/12/2012		7.05	8.79	2.98	5.22				
7/02/2013	5.96	7.09	8.65	2.98	5.35				
4/03/2013	4.30	7.13	7.90	3.05	3.42				
18/03/2013	4.66	7.12	8.09	3.06	5.43	6.94	7.01	6.74	10.32
27/03/2013	5.58	7.10	8.34	3.03	5.47	6.94	7.13	6.74	10.29
17/05/2013	5.22	7.01	8.41	2.95	5.28	6.77	5.70	6.66	10.20
19/06/2013	5.27	7.08	8.37	3.05	5.38	6.72	5.62	6.93	10.26

1 TD- Total depth (m)

2 RL – Reduced level (mAHD)

Table 8.2 Manually recorded groundwater levels (mAHD)

Date	PZ01	PZ06	PZ09	PZ24	PZ31	PZ102	PZ103	PZ107	PZ112
TD	16.5	10.1	10.4	7.9	8	8.6	12.4	8.7	15.6
RL	158.5	159	160	154.8	160.8	161	160.7	158	159.8
21/11/2012	152.7	152.8	151.7	151.9	156.1				
12/12/2012		151.9	151.2	151.8	155.6				
7/02/2013	152.5	151.9	151.3	151.8	155.4				
4/03/2013	154.2	151.9	152.1	151.8	157.4				
18/03/2013	153.8	151.9	151.9	151.7	155.4	154.1	153.7	151.3	149.5
27/03/2013	152.9	151.9	151.7	151.8	155.3	154.1	153.6	151.3	149.5
17/05/2013	153.3	151.9	151.6	151.8	155.5	154.2	155	151.3	149.6
19/06/2013	153.2	151.9	151.6	151.7	155.4	154.3	155.1	151.1	149.5

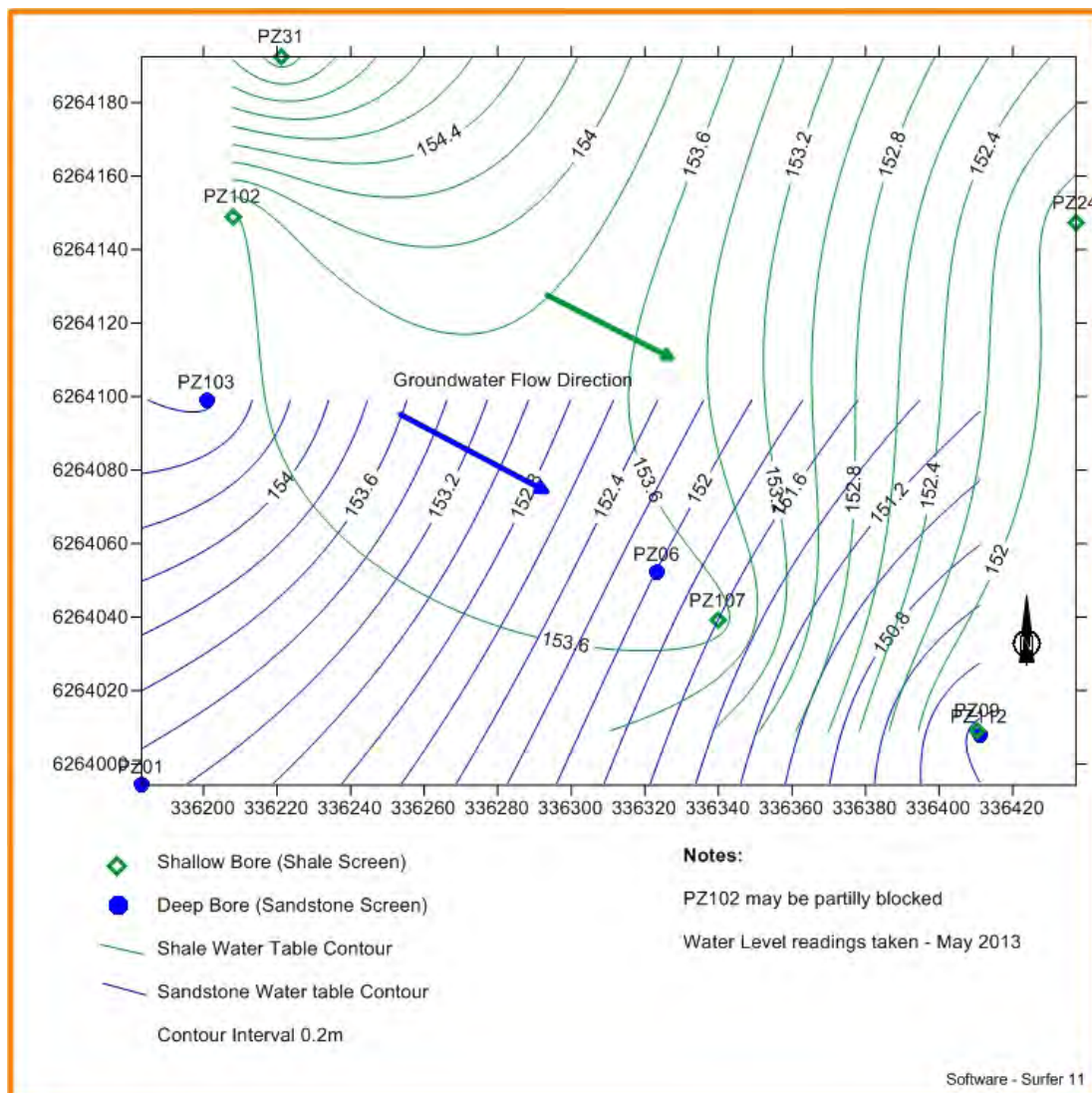


Figure 8.1 Water level contours for shale and sandstone bores

8.2. Soil analytical results

Soil analytical results were compared to the soil assessment criteria. Results indicate the following exceedances for soils (and respective criteria):

Previous investigation (DP 2012)

- Bore 2 (0.2-0.3 m):
 - o Nickel, 17 mg/kg (NEPM 2013 EIL 10 mg/kg criterion)
- Bore 15 (0-0.1):
 - o Zinc, 140 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- Bore 19 (0-0.1):
 - o Nickel, 14 mg/kg (NEPM 2013 EIL 10 mg/kg criterion)
- Bore 21 (0-0.1):
 - o Zinc, 260 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- Bore 28 duplicate sample BD1 (0-0.1):
 - o Zinc, 130 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)

Current investigation

- TP13 (0-0.1 m):
 - o Copper, 170 mg/kg (NEPM 2013 EIL 65 mg/kg criterion)
- TP15
 - o Zinc, 150 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- TP27 (0-0.1 m):
 - o Copper, 440 mg/kg (NEPM 2013 EIL 65 mg/kg criterion)
- TP47 (0.1-0.2 m):
 - o Nickel, 19 mg/kg (NEPM 2013 EIL 10 mg/kg criterion)
- TP59A
 - o Zinc, 120 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- TP61
 - o Cadmium, 3 mg/kg (NEPM 1999 PBIL 3 mg/kg criterion)
 - o Zinc, 110 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- TP62
 - o Copper, 170 mg/kg (NEPM 2013 EIL 65 mg/kg criterion)
 - o Zinc, 110 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- TP63
 - o Nickel, 25 mg/kg (NEPM 2013 EIL 10 mg/kg criterion)
 - o Zinc, 100 mg/kg (NEPM 2013 EIL 100 mg/kg criterion)
- TP07
 - o Chrysotile, Amosite and Crocidolite asbestos detected

Other soil analytical results indicated that:

- Concentrations of TPH and BTEX were either below the laboratory limit of reporting (LOR) or below the adopted site assessment criteria in all samples analysed
- All other metal concentrations, other than those listed above were below the site assessment criteria
- PAH, OCP, OPP, PCB and phenol concentrations were below laboratory LOR in all samples analysed
- Asbestos was not detected in any of the other soil samples analysed.

Table C1, Appendix C presents soil analytical results with comparison to the adopted site assessment criteria.

Soil analytical exceedances are reported on **Figure 4, Appendix A**.

8.3. Groundwater analytical results

Tabulated analytical results for groundwater analysis are presented within the laboratory summary tables (**Appendix C**) while the laboratory reports are presented in **Appendix E**.

8.3.1. First groundwater monitoring event

Nine groundwater samples were collected from the site on 24 March 2013. In all of the groundwater samples, TPH, BTEX, OCP, OPP, PAH and PCBs were not detected above laboratory LORs with the exception of TPH C₆-C₁₀ (22 µg/L) detected in PZ01. Phase separated hydrocarbon (PSH) was not detected (with the use of an interface probe) within any of the monitoring wells.

Heavy metal concentrations detected above LOR were all below laboratory GILs with the exception of:

- Cadmium in piezometers (PZ) 06, 102, 107, 09, 24
- Copper in PZ 06, 102, 107, 112, 09, 24, 31
- Lead in PZ 112, 24
- Mercury in PZ 09
- Nickel in PZ 06, 102, 103, 107, 112, 01, 09, 24, 31
- Zinc in PZ 06, 102, 103, 107, 112, 01, 09, 24, 31.

Heavy metals concentrations detected above GILs are shown on **Figure 5, Appendix A**.

8.3.2. Second groundwater monitoring event

Nine groundwater samples (plus QAQC) were collected from the site on 19 March 2013. In all of the groundwater samples, TPH, BTEX, OCP, OPP, PAH and PCBs were not detected above laboratory LORs. PSH was not detected (with the use of an interface probe) within any of the monitoring wells.

Heavy metal concentrations detected above LOR were all below laboratory GILs with the exception of:

- Cadmium in piezometers (PZ) 107, 112, 24
- Copper in PZ 06, 09, 102, 103, 107, 112, 24, 31
- Lead in PZ 112, 24
- Mercury in PZ 09
- Nickel in PZ 01, 06, 102, 103, 107, 112, 24, 31
- Zinc in PZ 01, 06, 09, 102, 103, 107, 112, 09, 24, 31.

Heavy metals concentrations detected above GILs are shown on **Figure 5, Appendix A**.

8.4. Discussion of results

Based on the results:

- TPHC_{10-C₃₆} (sum of total) was detected in 14 of the total 64 near surface sample locations at concentrations ranging between 255 and 1172mg/kg above the laboratory LOR but below the adopted GILs
- Given there was no staining or odours observed or PID readings detected >1ppm, the low levels of TPH are likely to be sourced from eucalyptus wood chips and/or grease from the tree felling machinery
- Comparison of the two groundwater events indicated the June 2013 sample in PZ01 did not detect any hydrocarbons and the detection is likely due to contamination from hydrocarbon-based grease used during well installation drilling.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1. Overview

All fieldwork was performed by experienced SMEC staff and suitably qualified subcontractors in accordance with SMEC's standard operating procedures.

All samples were collected directly into laboratory supplied sample bottles. To avoid potential cross-contamination a clean pair of nitrile gloves was worn prior to the collection of each sample. All equipment that came into contact with multiple well locations was decontaminated with Decon 90 and rinsed prior to use at each location.

All sample bottles were filled with sample directly from dedicated Waterra foot valve and tubing and immediately placed in an ice-filled esky to keep the samples below a temperature of about 4 °C.

The laboratory reports and certificates, sample receipt and Chain of Custody (COC) information are provided in **Appendix E**.

9.2. Laboratories

Samples were submitted to NATA accredited laboratories Envirolab (primary) and ALS (secondary – QA/QC). Analytical methods complied with NEPM and NSW EPA requirements, with Practical Quantitation Limits (PQLs) and Limits of Reporting (LOR) used in the laboratory tests less than the adopted site investigation criteria.

9.3. Sample handling, storage and transportation

All samples, including QA samples, were transported to the laboratories with relevant COC documentation. The COC form was completed with the sample names, sampling date and required analyses. The samples were sent in a sealed esky to the laboratory for analysis within the prescribed analyte holding times.

9.4. Documentation

Chain of custody documentation was signed and dated by the laboratories stating that all samples:

- were received cool and in good order
- were presented in adequate sample containers
- that all samples submitted for volatiles were correctly contained with no headspace
- that all samples were labelled appropriately according to current quality field sampling protocols.

9.5. Laboratory analytical methods

Both labs used NATA accredited testing procedures. Analytical methods were in accordance with NEPC procedures. Refer to **Appendix E** – Laboratory reports for details on the analytical techniques.

9.5.1. Accuracy

Accuracy is the level of agreement between an experimental determination and the true value of the parameter being measured. Reference samples or matrix spikes were used to determine the accuracy of the analytical technique. The percentage recovery for spiked samples, calculated by the laboratory, should be within the acceptance limits described as follows for the methods used.

9.5.2. Laboratory control spikes

Laboratory control spikes were used during the analysis to check the quality of laboratory preparation techniques. The target frequency of one per analytical batch of 20 per analytical method with the laboratory acceptance criteria of generally:

- 70-130% for inorganics/metals
- 60–140% for organics
- 10 – 140% for speciated phenols.

The matrix spike recoveries for the batches relating to this project were within the acceptable criteria.

9.5.3. Laboratory blanks

Laboratory blanks were used during the laboratory analysis to identify whether contaminants of concern were introduced to the samples during laboratory analysis procedures.

Laboratory blanks are used to monitor unintentionally introduced contaminants to the sample in the laboratory, for example organic or inorganic residues contained on glassware or cleaning reagents. Laboratory method blanks are used as part of the precision process. The acceptance criteria of the method blank is not detected >95% of the reported EQL. No target analytes were detected in any of the laboratory blanks, indicating that the analytical method was satisfactory and no contamination occurred.

It is considered that the laboratory results reported represent the true values of contaminants in situ, and that bias has not been introduced:

- By chemicals during handling or transport
- From contaminated equipment
- From contaminated reagents
- During laboratory preparation and analysis.

9.5.4. QA/QC decision error limits

For the purposes of this investigation, an overall error limit of 95% (i.e. 5% outside acceptable limits) was adopted in line with industry standards.

9.6. Blind field duplicates

Summary QA/QC Assessment

A total population of 62 discrete soil samples were analysed for contaminants of concern for soils. A total of seven Intra-laboratory duplicate samples (QC1, QC3, QC5, QC7, QC9, QC10, QC11) were analysed which is within the target ratio of 1:20. A total of three Inter-laboratory duplicate samples (QC2, QC6 and QC8) were obtained which is inside the target ratio of 1:20. All RPDs for replicate sample QC1 were within the recognised quality control intervals (see **Table C3, Appendix C**), with the following exceptions:

- RPDs for replicate sample QC1 above the RPD criteria in soil for arsenic (91%) and iron (65%), attributed to natural variations in clay mineralogy
- RPDs for replicate sample QC10 above the RPD criteria in soil for copper (61%) and iron (33%), attributed to heterogeneity of the road base fill.

It is considered that RPDs above the RPD criteria in soil can be attributed to heterogeneity of the materials and that it is not a reflection of the analytical methods used. Results are presented within **Table C3, Appendix C**.

A total population of 18 groundwater samples were analysed for contaminants of concern. One intra-laboratory duplicate sample (DUP) was analysed which is within the target ratio of 1:20. No RPDs were above the quality control intervals presented in **Table C4, Appendix C**. It is therefore considered that the field duplicate/laboratory QA/QC is adequate for the investigation.

The reported results indicate that the accuracy and precision of the analysis was satisfactory and constitutes an appropriate reflection of in-situ concentrations for soil and groundwater, and are thus suitable to form an adequate basis for the assessment of site conditions.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1. Conclusions

- The site is located at the corner of Wakehurst Parkway and Warringah Road, Frenchs Forest NSW and comprises an area of approximately 5.6 ha
- The site is secure and is currently being developed by HI for the Northern Beaches Hospital
- Donnelly Constructions is the on-site civil contractor responsible for the Stage 1 site clearance and preparatory works
- The Stage 1 site clearance and preparatory works include removal of vegetation, footings and demolition waste from buildings previously removed, and diversion of services
- A review of previous environmental reports noted the following:
 - Possible historic use of pesticides on a former orchard located west of the site, giving rise to potential spray drift and associated contamination of surface soils
 - The subsurface conditions encountered at the sample locations indicated no signs of gross contamination observed (e.g. odours, staining)
 - The presence of asbestos in former residential areas where demolition has occurred
 - The need for a hazardous materials survey on the community health centre building prior to demolition²
 - The densely vegetated bushland restricting visual inspection and sampling
 - Relatively shallow topsoil and fill material indicating a low potential for significant contamination from uncontrolled filling
 - Heavy metal concentrations above EILs in surface soils in backyards of former residential dwellings located along Bantry Bay Road.
- Sampling and analysis was undertaken at 64 locations across the site to target historical environmental issues identified in previous investigations. The current investigation established the following counterpoints to the list above:
 - Extensive grid based test pit sampling (approximately 27 m apart) was undertaken in the western portion of the site, however no DDD or DDT contamination (indicators for pesticide spray drift) were identified with the exception of DDT and DDD detected at TP15 where a concrete slab was found to be present
 - Although the subsurface across the site showed no staining or odours, low levels of hydrocarbons were detected at 14 locations; the likely source of TRH is considered to be from eucalyptus wood chips and/or grease from tree felling machinery
 - The presence of asbestos on the ground surface was found to extend into buried waste identified in backfilled swimming pools, house cellars, the stockpile of concrete and cleared vegetation areas previously inaccessible, particularly at the rear of former residential blocks on the eastern side of Bantry Bay Road. Asbestos was also encountered at three locations on the western side of Bantry Bay Road indicating there may have been dumped fibro sheeting or former sheds associated with some concrete slabs identified in the former vegetation cleared areas
 - No asbestos occurred at the location of the former community health centre building, i.e. the current location of the site office
 - The majority of vegetation on the site had been cleared at the time of the Phase 2 investigation works with the exception of a number of individual mature trees that had been retained around the general perimeter of the site and vegetation in the RVZ at the

² The survey was conducted on the community health centre building in early 2013 prior to demolition.

eastern end of the site. Thinning of the understorey in the RVZ revealed domestic waste such as scrap metal dumped on the ground surface (which it is understood will be removed as part of the Stage 1 site clearance and preparatory works)

- o Test pit investigations in the cleared vegetation areas revealed buried waste fill in six locations:
 - TP15 revealed some ACM fibro sheeting, a concrete slab and bricks (footings or garden bed) to 0.3 m bgl.
 - TP29 revealed lots of bricks (former garden bed) to 0.3 m bgl
 - Domestic rubbish buried beneath a thin clay covering in the northeast quadrant
 - C&D waste outcropping along an embankment located in the southeast quadrant
 - Swimming pool backfilled with C & D waste in the back of former street address 7 Bantry Bay Road
 - An underground cellar backfilled with C & D waste at the back of former street address 17 Bantry Bay Road
- o Heavy metal concentrations above EILs were identified in near surface soils mainly in the former residential areas of the site where bush tracks, concrete slabs or buildings were previously located
- Analytical results from the current investigation indicate elevated levels (as compared to the soil assessment criteria) of heavy metals (Cu, Zn, Ni) above EIL criteria but well below HIL D commercial industrial land use criteria within near surface soils at eight locations
- These EIL exceedances are considered preliminary in nature and must be considered in terms of an Ecological Risk Assessment (ERA) when all potential receptors are known. Specifically, the location of future landscape zones is required to protect proposed amenity planting from elevated metals in soil
- Analytical evidence of asbestos contamination was identified at one location (TP07) with visual observations recorded at several locations shown on **Figure 3, Appendix A**
- Fill material was observed at the following six locations:
 - o TP15 – near surface fill comprised dark grey silty clay with some red sandstone rubble, bricks and traces of glass, ash and slag
 - o TP29 – reworked natural clay, topsoil and bricks
 - o Northeast quadrant of the site consisting of grey brown silty clay with domestic rubbish waste to a depth of 0.6 m bgl
 - o Southeast quadrant of the site consisting of brown clay with domestic litter including C&D waste to a depth of 1.0 m bgl
 - o Backfilled swimming pool consisting of C&D waste to a depth of approximately 1.0 m bgl
 - o Backfilled house cellar consisting of C&D waste to a depth of approximately 1.0 m bgl
- On the basis of the intermittent and heterogeneous nature of fill material observed during site investigations, the fill material at the site may contain localised contamination in the form of (but not limited to) broken pieces bonded cement fibre sheeting containing asbestos fibres
- Targeted intrusive investigations within the fill areas in the northeast and southeast quadrants did not identify chemical contamination associated with fill materials
- Groundwater was detected between approximately 2.93–10.32m bgl. Calculated RLs for the groundwater table indicate that groundwater flow direction is southeast, in the direction of Middle Harbour and Manly Dam
- Groundwater results indicate elevated levels of heavy metals in all monitoring well locations
- Elevated heavy metal concentrations in groundwater are likely to be representative of background conditions and unlikely to be associated with any site-based sources of contamination

- Subject to development and implementation of a Construction Environmental Management Plan (CEMP), Remedial Action Plan (RAP) and site validation, the site is considered suitable for its proposed use in accordance with the adopted NEPM 2013 land use categories of 'commercial' and 'public open spaces'
- Provided the identified ACM is managed appropriately, and unexpected find protocols are in place, the contamination on the site is unlikely to pose an unacceptable risk to human health and/or the environment
- On the basis of the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (DECC, 2009), the site does not currently require notification under Section 60 of the *Contaminated Land Management Act 1997* because:
 - Isolated contamination reported within site soil is mainly concerned with the presence of ACM and therefore the licensed removalist has notified the regulator (NSW WorkCover) of forthcoming licensed asbestos removal works to be undertaken on site
 - Areas of known surface ACM contamination have been cordoned off, as such a person will not foreseeably be exposed to the contamination identified within site soils
 - Contamination identified within groundwater is likely to be representative of background conditions and unlikely to be associated with any site-based sources of contamination.

10.2. Recommendations

Based on the work carried out for this Phase 2 ESA, the following is recommended:

- Preparation of a RAP that contains but is not limited to:
 - An Asbestos Management Plan (AMP) documenting the requirement for air monitoring during removal works and Unexpected Finds Protocols specific to friable asbestos if encountered. The AMP should also detail the roles of appropriately licensed:
 - Class B Removalist to prepare the Asbestos Removal Control Plan (ARCP) and remove known bonded asbestos
 - Class A Removalist (if required as a contingency) in the event that friable asbestos is encountered
 - Independent Class A Asbestos Assessor for issuing site clearance certificates
 - Framework for Site Validation to make the site suitable for the end land uses including commercial industrial hospital site and public open spaces with landscaped amenity planting areas
 - Development of site validation criteria including calculated EILs in terms of a site specific ERA having consideration for potential receptors
- Given near surface soils exceeded the preliminary EIL site criteria for copper, zinc and nickel, it is recommended that EILs are further developed in the RAP in terms of future amenity planting
- The CEMP for the Stage 1 site clearance and preparatory works should be reviewed and revised as appropriate with regard to inclusion of a Waste Management Plan (WMP) documenting the procedures (including stockpile tracking, waste classification and disposal) for remediating and managing:
 - C&D waste and domestic litter identified at the site either buried or dumped on ground surface
 - ACM contamination identified in surface soils, buried fill, C&D waste and on the underside of concrete stockpiled in southeast corner
 - Unexpected finds of contaminated fill during the proposed redevelopment works.
- Prior to commencement of Stage 2 development works, preparation of a CEMP that includes a Waste Management Plan (WMP) addressing the matters in the preceding recommendation.

11. REFERENCES

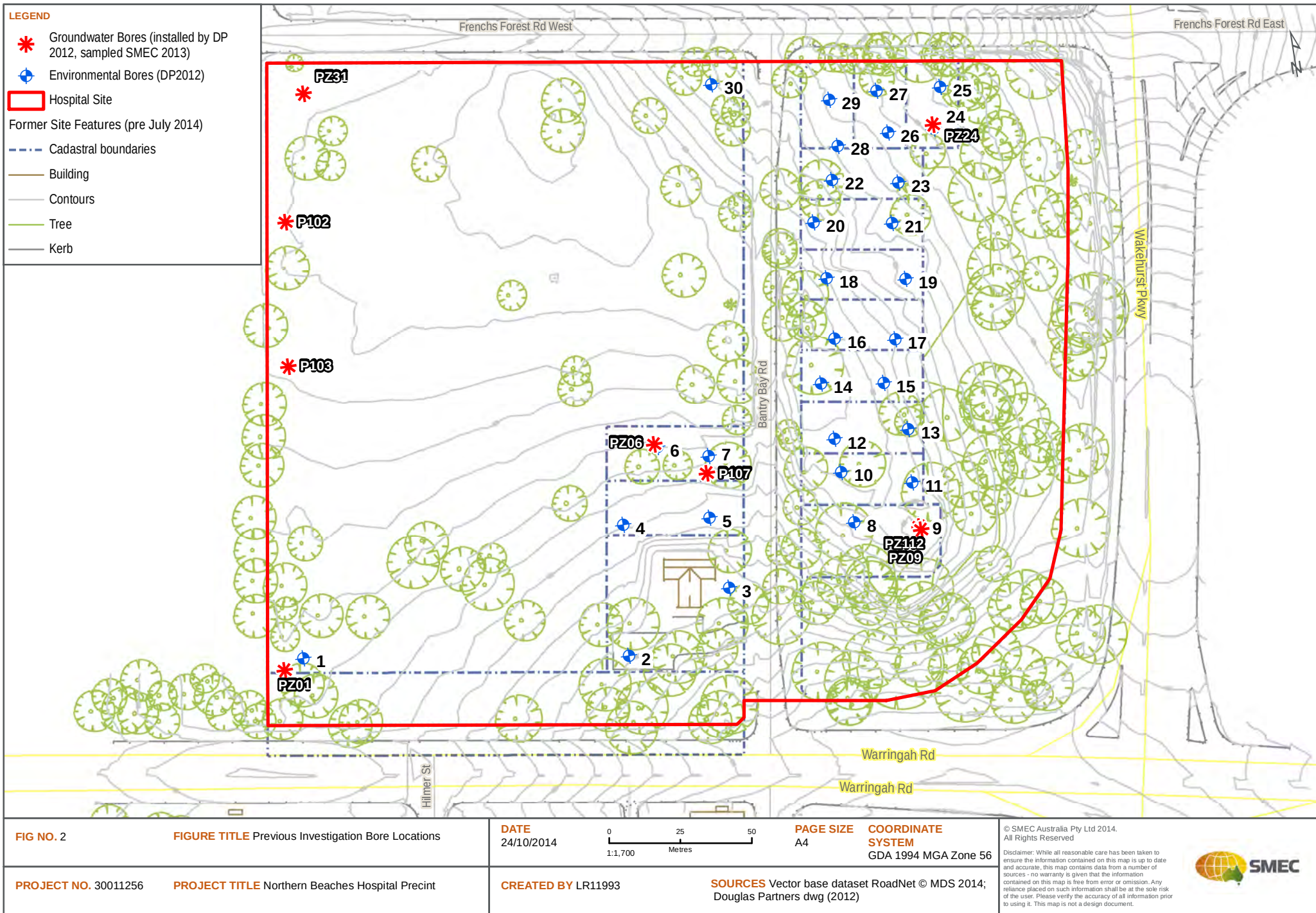
1. ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Waters, Australian and New Zealand Environment and Conservation Council /Agricultural and Resource Management Council of Australia and New Zealand
2. Coffey (2011) *Preliminary Site Contamination Assessment, Proposed Frenchs Forest Hospital, Corner of Wakehurst Parkway and Warringah Road, Frenchs Forest NSW*, Ref: ENAURHOD04125AA, prepared by Coffey 22 March 2011
3. Douglas Partners (2012a) *Report on Preliminary Geotechnical Investigation, Proposed Northern Beaches Hospital, Corner of Wakehurst Parkway and Warringah Road Frenchs Forest*, report prepared for Health Infrastructure, July 2012
4. Douglas Partners (2012b) *Report on Phase 1 Contamination Assessment with Limited Sampling, Proposed Northern Beaches Hospital, Corner of Wakehurst Parkway and Warringah Road Frenchs Forest*, prepared July 2012
5. Douglas Partners (2013) *Report on Standpipe Piezometer Installation, Proposed Northern Beaches Hospital, Corner of Wakehurst Parkway and Warringah Road Frenchs Forest*, report prepared for Health Infrastructure, April 2013
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7. NSW DECC (2009) *Waste Classification Guidelines, Part 1: Classifying Waste*
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12. SMEC (2013) *Northern Beaches Hospital SSI Application EIS for Stage 1 including Concept Design, Site Clearance & Preparatory Works*, prepared October 2013
13. SMEC (2014) *Northern Beaches Hospital SSI Application SSI 13_5982, Submissions Report/preferred Infrastructure Report*, prepared February 2014.

APPENDIX A

SITE FIGURES



FIG NO. 1	FIGURE TITLE Site Location Plan	DATE 23/10/2014	PAGE SIZE A4	COORDINATE SYSTEM GDA 1994 MGA Zone 56	© SMEC Australia Pty Ltd 2014. All Rights Reserved Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, this map contains data from a number of sources - no warranty is given that the information contained on this map is free from error or omission. Any reliance placed on such information shall be at the sole risk of the user. Please verify the accuracy of all information prior to using it. This map is not a design document.
PROJECT NO. 30011256	PROJECT TITLE Northern Beaches Hospital Precinct	SOURCES Vector base dataset RoadNet © MDS 2014 © 2014 DigitalGlobe © 2014 GeoEye Earthstar Geographics SIO © 2014 Microsoft Corporation			CREATED BY LR11993



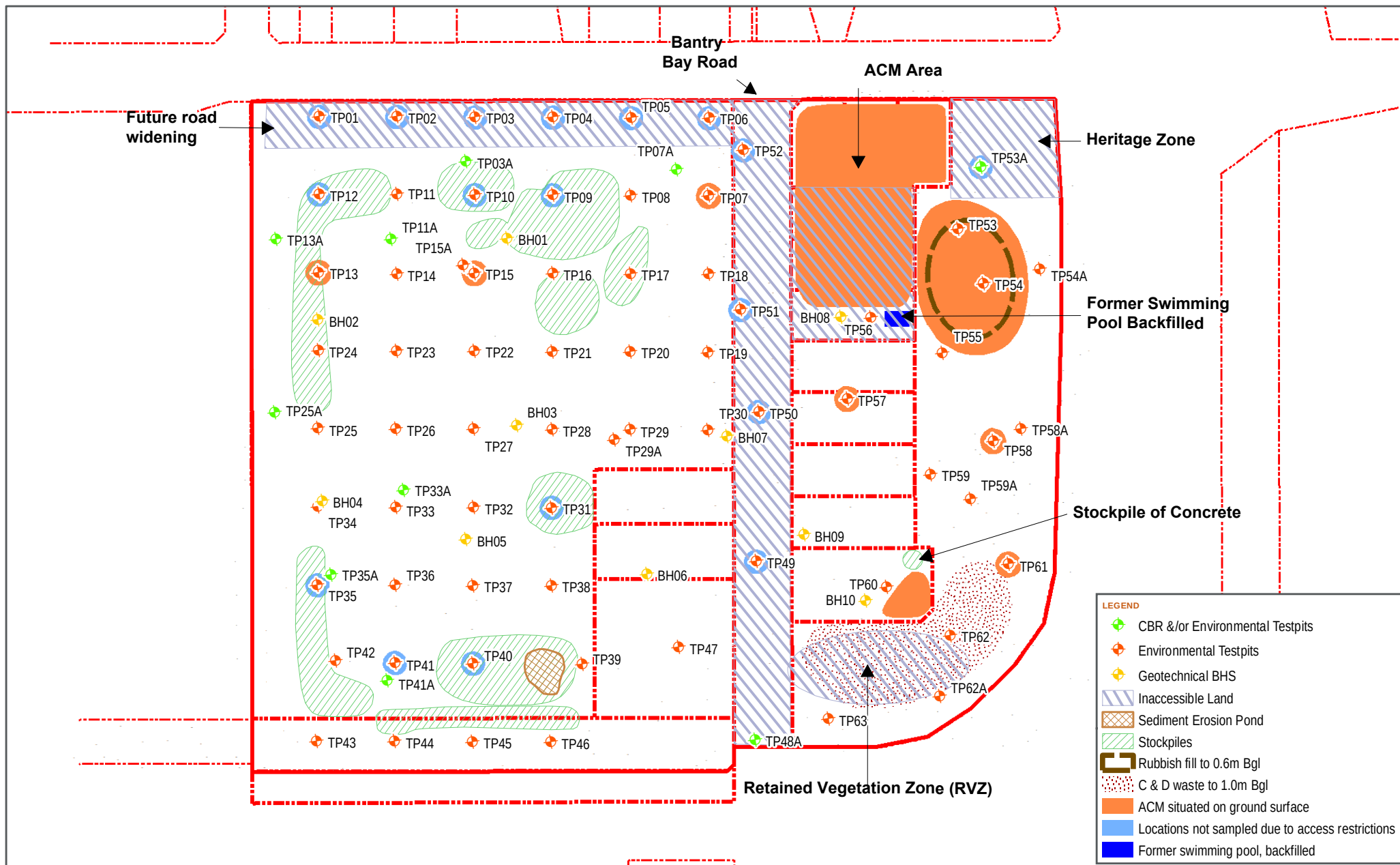


FIG NO. 3 **FIGURE TITLE** Current Sampling Locations

DATE
28/10/2014

0 25 50
1:1,784 Metres

COORDINATE SYSTEM
GDA 1994 MGA Zone 56

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PROJECT NO. 30011256 **PROJECT TITLE** Northern Beaches Hospital Precinct

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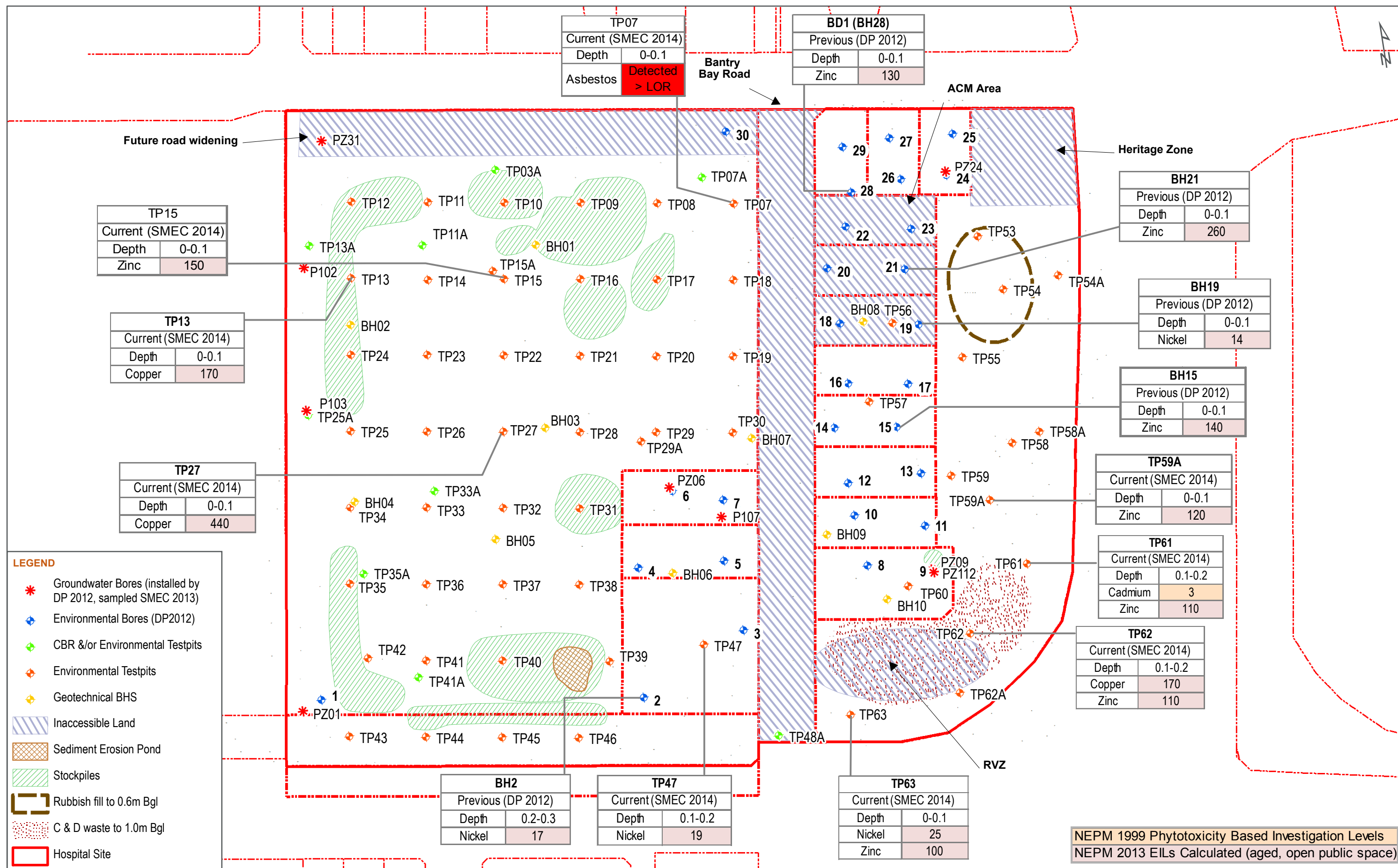


FIG NO. 4

FIGURE TITLE Combined Phase 1 and Phase 2 Locations with Soil Contamination Exceedances

DATE 28/10/2014

0 25 50
1:1,250 Metres

COORDINATE SYSTEM
GDA 1994 MGA Zone 56

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PROJECT NO. 30011256

PROJECT TITLE Northern BEaches Hospital Precinct

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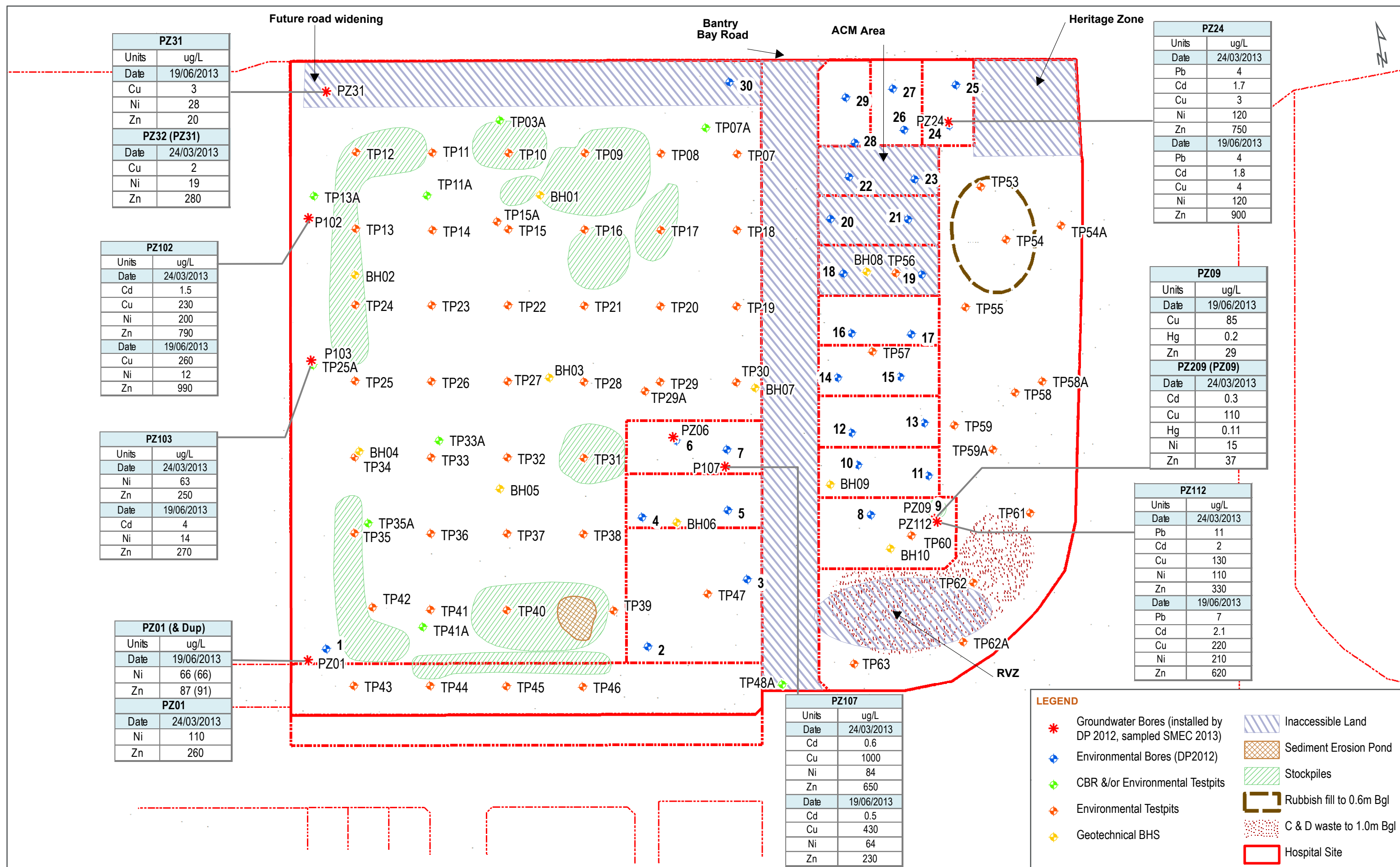


FIG NO. 5

FIGURE TITLE Groundwater Investigation Level Exceedances

DATE
28/10/2014

0 25 50
1:1,250 Metres

PAGE SIZE
A3

COORDINATE
SYSTEM
GDA 1994 MGA Zone 56

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APPENDIX B

SAMPLE REGISTER

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
Eastern Area - Former Residential														
TP56	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.20	0.70	Reworked Natural	AEC1	Fill - grey brown silty clay	Bricks and Pavers at 0.1m with ACM observed on surface nearby	NA	NA
TP57	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.30	0.80	Fill	AEC1	Fill - reworked natural orange brown clay with patches of bedding sand	Bricks and sand with ACM observed on surface	NA	NA
TP60	NA	0-0.1	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.10	0.60	Fill	AEC1	Fill - sand	Concrete slab at surface	NA	NA
BH08	HOLD	0.2-0.3	13/10/2014	117588	NA	<1	0.00	10.14	natural	AEC1	Silty clay - brown, moderate plasticity with traces of sand and gravel and organic matter	NA	NA	NA
BH09	HOLD	0.2-0.3	13/10/2014	117588	NA	<1	0.20	9.83	natural	AEC1	Clay - orange brown with red brown iron stone gravels, medium plasticity	NA	NA	NA
BH10	NS	NA	16/10/2014	NA	NA	NA	NA	NA	NA	AEC1	NA	NA	NA	NA
Eastern Area - Former Bushland														
TP53	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, OC, PCB, M8, Tot.Phenols, Asbestos	<1	0.60	1.10	Fill	AEC2	Fill - grey brown silty clay with domestic rubbish waste	ACM, rubble, concrete, tin, scrap metal and fly screen	NA	NA
TP53A	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC2	NA	NA	NA	NA
TP54	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.60	1.10	Fill	AEC2	Fill - grey brown silty clay with domestic rubbish. Comprises a thin clay cap covering waste.	ACM and scrap mateal at 0.1m	NA	NA
TP54	Lab Dup	0.1-0.2	13/10/2014	117545	NA	<1	0.60	1.10	Fill	AEC2	Fill - grey brown silty clay with domestic rubbish. Comprises a thin clay cap covering waste.	ACM and scrap mateal at 0.1m	NA	NA
TP54 - TRIPLICATE	Lab Trip	0.1-0.2	13/10/2014	117545	NA	<1	0.60	1.10	Fill	AEC2	Fill - grey brown silty clay with domestic rubbish. Comprises a thin clay cap covering waste.	ACM and scrap mateal at 0.1m	NA	NA
TP54A	NA	0.4-0.5	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos, pH, CEC	<1	0.00	0.50	A Horizon	AEC2	Silty Clay - grey brown with rootlets	No foreign material	NA	NA
TP54A	Lab Dup	0.4-0.5	13/10/2014	117545	NA	<1	0.00	0.50	A Horizon	AEC2	Silty Clay - grey brown with rootlets	No foreign material	NA	NA
TP55	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.20	0.70	Reworked Natural	AEC2	Fill - brown silty clay	Piece of glass and brick at 0.1m	NA	NA
TP58	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.20	0.70	Reworked Natural	AEC2	Fill - reworked natural grey brown silty clay	Building and demolition waste on surface including ACM	NA	NA
TP58A	NA	0.4-0.5	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos, pH, CEC	<1	0.00	0.50	A horizon	AEC2	Silty Clay - grey brown with organic rootlets	No foreign material	NA	NA
TP59	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.20	0.70	Reworked Natural	AEC2	Fill - red brown and light grey mottled silty clay with some organic matter	Burnt wood on surface	NA	NA
TP59A	NA	0-0.1	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.10	0.60	Fill	AEC2	Fill - grey silty clay with bricks and domestic litter	Tree debris at surface. Note: scrap metal and trampoline on surface nearby	TRH, PAH	Zn
TP61	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, OC, PCB, M8, Tot.Phenols, Asbestos	<1	0.50	0.80	Fill	AEC2	Fill - brown clay with domestic litter including plastic toys etc, C&D waste	Bricks, ACM, glass, metal, concrete, pens	PAH	Cd, Zn
TP61	NA	0.5-0.6	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.50	0.80	Natural	AEC2	Clay - light grey and orange brown mottled with rootlets	No foreign material	NA	NA

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
TP61	Lab Dup	0.5-0.6	13/10/2014	117545	NA	<1	0.50	0.80	Natural	AEC2	Clay - light grey and orange brown mottled with rootlets	No foreign material	NA	NA
TP62	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	1.00	1.50	Fill	AEC2	Fill - brown clay with domestic litter including plastic toys etc, C&D waste	Bricks, tiles, sandstone, terracotta	PAH	Cu, Zn
TP62	NA	0.9-1.0	13/10/2014	117545	TRH, BTEX, PAH, OC, PCB, M8, Tot.Phenols, Asbestos, pH,	<1	1.00	1.50	Reworked natural	AEC2	Silty clay - dark grey with organic tree roots	Staining at 0.9m likely to be charcoal. Under buried waste	PAH	NA
TP62A	NA	0-0.1	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.00	0.50	A horizon	AEC2	Silty Clay - grey brown with organic material	No foreign material	TRH, PAH	NA
TP63	NA	0-0.1	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.00	0.50	A horizon	AEC2	Silty Clay - grey brown with organic material	No foreign material	TRH	Ni, Zn
Western Area - Former Residential/ Commercial														
TP47	NA	0-0.1	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	0.10	0.60	Fill	AEC3	Fill - roadbase gravel fill with pebbles, silt and sand	No foreign material	PAH	NA
TP47	NA	0.1-0.2	13/10/2014	117545	TRH, BTEX, PAH, OC, PCB, M8, Tot.Phenols, Asbestos	<1	0.10	0.60	A horizon	AEC3	Silty Clay - dark grey with rootlets	No foreign material	NA	Ni
TP47	Lab Dup	0.1-0.2	13/10/2014	117545	NA	<1	0.10	0.60	A horizon	AEC3	Silty Clay - dark grey with rootlets	No foreign material	NA	NA
QC9	TP47/0-0.1	Envirolab	13/10/2014	117545	TRH, BTEX, PAH, M8, Asbestos	<1	NA	NA	NA	AEC3	NA	NA	PAH	NA
QC10	TP47/0-0.1	Envirolab	13/10/2014	117545	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC3	NA	NA	PAH	NA
Western Area - Former Bushland														
TP01	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP02	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP03	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP03A	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.00	Underlying topsoil removed	AEC4	Silty Clay with traces of organic roots	No foreign material	NA	NA
TP03A	NA	1.0m	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	1.00	Underlying topsoil removed	AEC4	Shale - grey, medium strength, slightly weathered	No foreign material	NA	NA
TP03A	Lab dup	1.0m	2/10/2014	117190	NA	<1	0.00	1.00	Underlying topsoil removed	AEC4	Shale - grey, medium strength, slightly weathered	No foreign material	NA	NA

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
TP04	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP05	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP06	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP07	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8, Asbestos	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	ACM at surface	NA	NA
TP07	Lab Dup	0-0.1	9/10/2014	117389	NA	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	ACM at surface	NA	NA
TP07A	NS	NA	NA	117389	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP08	QC7 and QC8	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	No foreign material	NA	NA
TP09	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP10	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP11A	NA	1.0m	2/10/2014	117190	TRH, BTEX, PAH, M8	<1	0.00	1.00	Natural	AEC4	Shale - grey, medium strength, slightly weathered		NA	NA
TP12	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP13	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - Dark grey with some organic matter	ACM sited at surface with other materials including bricks, concrete, traces of litter, wood, debris and glass	TRH	Cu
TP13A	NA	0-0.1	2/10/2014	117190	NA	<1	0.00	1.00	Underlying topsoil removed	AEC4	Silty Clay - light grey with some yellow mottling	No foreign material	NA	NA
TP14	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey brown with some organic tree roots	No foreign material	TRH, PAH	NA
TP15	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with some organic matter	ACM fragments at surface	TRH, PAH, DDD, DDT	Zn
TP15A	NA	0.1-0.2	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.30	0.80	Fill	AEC4	Fill - dark grey silty clay with some red sandstone rubble and bricks beneath a broken concrete slab and traces of glass, ash and slag.	Scrap metal on surface.	PAH	NA
TP16	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	Natural	AEC4	Silty Clay - grey brown with traces of organic roots	No foreign material	NA	NA

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
TP17	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - dark grey with organic matter at surface	No foreign material	NA	NA
TP18	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	No foreign material	NA	NA
TP19	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic grass roots	No foreign material	NA	NA
TP20	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic grass roots	No foreign material	NA	NA
TP20	NA	0.5-0.6	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8, CC, CEC, Fe, pH	<1	0.00	0.60	Natural	AEC4	Clay - light grey with some yellow mottling around organic roots	No foreign material	NA	NA
TP20	Lab Dup	0.5-0.6	9/10/2014	117389	NA	<1	0.00	0.60	Natural	AEC4	Clay - light grey with some yellow mottling around organic roots	No foreign material	NA	NA
TP21	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH	NA
TP22	QC3 and QC4	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH	NA
TP22	Lab dup	0-0.1	2/10/2014	117190	NA	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH	NA
TP23	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH	NA
TP24	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	No foreign material	NA	NA
TP25	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - grey brown with organic grass roots and some red laterite gravels	No foreign material	NA	NA
TP25A	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.00	Underlying topsoil removed	AEC4	Clay - light grey with some orange iron staining around organic roots	No foreign material	NA	NA
TP26	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark brown with organic grass roots	No foreign material	TRH	NA
TP27	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH	Cu
TP28	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH, PAH	NA
TP29	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	TRH, PAH	NA

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
TP29A	NA	0.2-0.3	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.30	0.80	Fill	AEC4	Fill - reworked natural clay mixed with topsoil and bricks	Bricks and garden bed	NA	NA
TP29A	Lab Dup	0.2-0.3	9/10/2014	117389	NA	<1	0.30	0.80	Fill	AEC4	Fill - reworked natural clay mixed with topsoil and bricks	Bricks and garden bed	NA	NA
TP29A - TRIPLICATE	Lab Triplicate	0.2-0.3	9/10/2014	117389	NA	<1	0.30	0.80	Fill	AEC4	Fill - reworked natural clay mixed with topsoil and bricks	Bricks and garden bed	NA	NA
TP30	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	No foreign material	NA	NA
TP31	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP32	QC5 and QC6	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos, CC, CEC, Fe, pH	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	NA	NA
TP32	Lab dup	0-0.1	3/10/2014	117190	NA	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic grass roots	No foreign material	NA	NA
TP33	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP33A	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.00	A Horizon	AEC4	Silty Clay - dark brown with organic grass roots	No foreign material	PAH	NA
TP33A	Lab dup	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.00	A Horizon	AEC4	Silty Clay - dark brown with organic grass roots	No foreign material	NA	NA
TP33A	NA	1.0m	2/10/2014	117190	NA	<1	0.00	1.00	Natural	AEC4	Clay - grey with yellow mottling around organic roots	No foreign material	NA	NA
TP34	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	Natural	AEC4	Silty Clay - light grey with yellow mottling around organic roots	Organic leaf litter and tree bark on surface	TRH, PAH	NA
TP35	NS	NA	NA	117190	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP35A	QC1 and QC2	1.0m	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos, CC, CEC, Fe, pH	<1	0.00	1.30	A Horizon	AEC4	Silty Clay - grey brown with organic tree roots	No foreign material	NA	NA
TP36	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	A Horizon	AEC4	Silty Clay - grey brown with organic tree roots	Organic leaf litter on surface	TRH	NA
TP37	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - light grey with organic tree roots	No foreign material	TRH	NA
TP38	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic tree roots	No foreign material	TRH, PAH	NA
TP39	NA	0-0.1	3/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8, Asbestos	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - dark grey with organic tree roots	No foreign material	NA	NA
TP40	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP41	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC4	NA	NA	NA	NA
TP41A	NA	0.5-0.6	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.60	Natural	AEC4	Silty Clay - dark grey with organic tree roots	No foreign material	NA	NA
TP42	NA	0-0.1	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	0.50	A Horizon	AEC4	Silty Clay - grey brown with organic matter at surface	No foreign material	NA	NA
TP43	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.00	Underlying topsoil removed	AEC4	Silty Clay - grey brown with traces of organic tree roots	No foreign material	TRH	NA
TP43	Lab dup	0-0.1	2/10/2014	117190	NA	<1	0.00	1.00	Underlying topsoil removed	AEC4	Silty Clay - grey brown with traces of organic tree roots	No foreign material	TRH	NA

Sample ID	Parent Sample/ Duplicates	Sample Depth	Sample Date	Lab No.	Analysis	PID (ppm)	Fill depth	Total Depth of Investigation (m)	Type	Location	Material Description	Additional Observation	Laboratory Results (other than metals) above LOR	Laboratory Results above Assessment Criteria
TP44	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.30	Underlying topsoil removed	AEC4	Silty Clay - grey brown with traces of organic tree roots	No foreign material	NA	NA
TP45	NA	0-0.1	2/10/2014	117190	TRH, BTEX, PAH, OC, OP, PCB, M8	<1	0.00	1.30	Underlying topsoil removed	AEC4	Silty Clay - grey brown with traces of organic tree roots	No foreign material	TRH	NA
TP46	NA	1.0m	2/10/2014	117190	TRH, BTEX, PAH, M8	<1	0.00	1.30	Underlying topsoil removed	AEC4	Clay - yellow brown and grey brown, tight, high plasticity	No foreign material	NA	NA
BH01	Na	0.2-0.3	10/10/2014	117588	TRH, BTEX, PAH, M8	<1	0.00	9.60	A horizon	AEC4	Silty clay - brown, low to moderate plasticity with traces of sand and gravel	NA	NA	NA
BH02	QC11	0.2-0.3	9/10/2014	117588	TRH, BTEX, PAH, M8	<1	0.00	10.00	A horizon	AEC4	Silty clay - light grey , medium plasticity with trace of rootlets	NA	NA	NA
BH03	NA	0.2	7/10/2014	117588	TRH, BTEX, PAH, M8	<1	0.00	10.10	natural	AEC4	Silty clay - pale grey, high plasticity with rootlets	NA	NA	NA
BH04	QC12	0.2	8/10/2014	117588	TRH, BTEX, PAH, M8	<1	0.00	8.98	natural	AEC4	Silty clay - light grey , medium to high plasticity with trace roots	NA	NA	NA
BH05	HOLD	0.2	7/10/2014	117588	NA	<1	0.00	10.15	natural	AEC4	Silty clay - pale grey with iron staining, medium plasticity, traces of rootlets	NA	NA	NA
BH06	HOLD	0.2	9/10/2014	117588	NA	<1	0.00	10.15	natural	AEC4	Silty clay - pale grey , medium plasticity	NA	NA	NA
BH07	NA	0.2-0.3	10/10/2014	117588	TRH, BTEX, PAH, M8	<1	0.00	9.19	natural	AEC4	Silty Clay - orange and brown mottled, medium plasticity with trace of fine grain gravel	NA	TRH	NA
BH07	Lab Dup	0.2-0.3	10/10/2014	117588	NA	<1	0.00	9.19	natural	AEC4	Silty Clay - orange and brown mottled, medium plasticity with trace of fine grain gravel	NA	TRH	NA
QC1	TP35A/1.0	Envirolab	2/10/2014	117190	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
QC2	TP35A/1.0	ALS	2/10/2014	ES1440408	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	PAH	NA
QC3	TP22/0-0.1	Envirolab	2/10/2014	117190	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
QC4	TP22/0-0.1	Hold	2/10/2014	ES1440408	TRH, BTEX, PAH	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
QC5	TP32/0-0.1	Envirolab	3/10/2014	117190	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
QC6	TP32/0-0.1	ALS	3/10/2014	ES1440408	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	PAH	NA
QC7	TP08/0-0.1	Envirolab	9/10/2014	117389	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	TRH, PAH	NA
QC8	TP08/0-0.1	ALS	9/10/2014	ES1440801	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	TRH, PAH	NA
QC11	BH02/0.2-0.3	Envirolab	9/10/2014	117588	TRH, BTEX, PAH, M8	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
QC12	BH04/0.2	Hold	8/10/2014	117588	NA	<1	NA	NA	NA	AEC4	NA	NA	NA	NA
TP7 (Material)	NA	0-0.1	9/10/2014	117389	Asbestos	-	NA	NA	NA	AEC4	ACM fragment	87x80x5mm Grey compressed fibre cement material	Chrysotile, Amosite, and Crocidolite asbestos detected	Asbestos
Bantry Bay Road														
TP48A	NA	0.5-0.6	9/10/2014	117389	TRH, BTEX, PAH, OC, OP, PCB, M8, Tot.Phenols, Asbestos	<1	0.90	1.70	Fill	AEC5	Fill - reworked natural red and grey clay with some laterite gravels	Utilised service trench in road verge as the testpit. Note presence of Optus cable and asphalt at surface.	NA	NA
TP49	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC5	NA	NA	NA	NA
TP50	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC5	NA	NA	NA	NA
TP51	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC5	NA	NA	NA	NA
TP52	NS	NA	NA	NA	NA	NA	NA	NA	NA	AEC5	NA	NA	NA	NA
TB1	NA	-	30/09/2014	117190	TPH, BTEX	NA	NA	NA	NA	NA	NA	NA	NA	NA
TS1	NA	-	30/09/2014	117190	BTEX	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
NS = Not Sampled
NA = Not Applicable
ND = Not detected above laboratory LOR
LOR = Limits of reporting

APPENDIX C

LABORATORY SUMMARY TABLES

[illegible]

Chemistry_Output_Table v2.xlsm , 23/10/2014



			BTEX							Field		Inorganics									
	Acidity	Carbonate as CaCO3	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	Alkalinity (total)	Hexachlorobenzene	Ammonia	Bicarbonate as CaCO3	Chloride	Electrical conductivity *(lab)	Fluoride	Hydroxide	Ionic Balance	Nitrate (as N)	Nitrite (as N)	
	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	µS/cm	mg/L	µg/L	%	mg/L	mg/L	
EQL	5	5	1	1	1	2	1		0.01	5	0.2	0.005	5	1	1	0.1	5000		0.005	0.005	
NEPM 2013 GILs, Fresh Waters			950				350					0.9									

Field_ID	LocCode	Sampled_Date	Report_Number																				
DUP	PZ01	19/06/2013	92553	96	<5	<1	<1	<1	<2	<1	<3	<0.01	77	-	0.089	77	580	2200	-	<5000	-2.4	0.043	<0.005
PZ01	PZ01	19/06/2013	92553	120	<5	<1	<1	<1	<2	<1	<3	<0.01	92	-	0.088	92	550	2200	-	<5000	-1.2	0.037	<0.005
PZ01	PZ201	24/03/2013	88098	210	<5	-	-	-	-	-	-	-	32	<0.2	0.049	32	830	3000	0.24	<5000	5.1	0.019	<0.005
PZ06	PZ06	24/03/2013	88098	280	<5	-	-	-	-	-	-	-	<5	<0.2	0.29	<5	2200	6500	0.28	<5000	-1.1	<0.005	<0.005
PZ06	PZ06	19/06/2013	92553	600	<5	-	-	-	-	-	-	-	1100	-	0.21	1100	2300	6800	-	<5000	-18	0.009	<0.005
PZ09	PZ09	19/06/2013	92553	94	<5	-	-	-	-	-	-	-	<5	-	0.046	<5	260	1200	-	<5000	-1.8	0.31	<0.005
PZ09	PZ209	24/03/2013	88098	340	<5	-	-	-	-	-	-	-	<5	<0.2	0.055	<5	170	800	<0.1	<5000	6.1	0.55	<0.005
PZ102	PZ102	24/03/2013	88098	230	<5	-	-	-	-	-	-	-	<5	<0.2	0.26	<5	1500	4500	0.48	<5000	4.9	0.035	<0.005
PZ102	PZ102	19/06/2013	92553	110	<5	<10	<10	<10	<20	<10	<30	-	530	-	0.11	530	150	650	-	<5000	-45	0.019	<0.005
PZ103	PZ103	24/03/2013	88098	200	<5	-	-	-	-	-	-	-	91	<0.2	0.052	91	440	2100	0.47	<5000	5.4	0.014	<0.005
PZ103	PZ103	19/06/2013	92553	33	<5	<1	<1	<1	<2	<1	<3	<0.01	110	-	0.081	110	110	770	-	<5000	-3.6	0.073	<0.005
PZ107	PZ107	24/03/2013	88098	390	<5	-	-	-	-	-	-	-	<5	<0.2	0.26	<5	2400	6900	0.26	<5000	-2.4	<0.005	0.006
PZ107	PZ107	19/06/2013	92553	400	<5	-	-	-	-	-	-	-	<5	-	0.15	<5	2500	7400	-	<5000	-5.9	<0.005	<0.005
PZ112	PZ112	24/03/2013	88098	170	<5	-	-	-	-	-	-	-	<5	<0.2	0.11	<5	1400	4600	0.39	<5000	8.2	0.049	0.008
PZ112	PZ112	19/06/2013	92553	210	<5	-	-	-	-	-	-	-	<5	-	0.11	<5	1600	4900	-	<5000	-4	0.031	<0.005
PZ24	PZ24	24/03/2013	88098	390	<5	-	-	-	-	-	-	-	<5	<0.2	0.16	<5	2100	6000	0.34	<5000	-5	0.012	<0.005
PZ24	PZ24	19/06/2013	92553	590	<5	-	-	-	-	-	-	-	<5	-	0.1	<5	2400	6300	-	<5000	-12	<0.005	<0.005
PZ31	PZ31	19/06/2013	92553	110	<5	<1	<1	<1	<2	<1	<3	<0.01	120	-	0.25	120	1100	3500	-	<5000	-40	<0.005	<0.005
PZ31	PZ32	24/03/2013	88098	35	<5	-	-	-	-	-	-	-	57	<0.2	0.11	57	230	990	<0.1	<5000	4.9	<0.005	0.01



	Nitrogen (Total)	Phosphate (as P)	pH (Lab)	Sodium (Filtered)	Sulphate	TDS	TKN (as N)	Lead	Metals								
								Lead (Filtered)	Aluminium (Total)	Arsenic (Filtered)	Cadmium (Filtered)	Calcium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Iron	Magnesium (Filtered)	Mercury (Filtered)
	µg/L	mg/L	pH_Units	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L
EQL	100	0.005		0.5	1	5	0.1	1	0.01	1	1	0.5	1	1	0.01	0.5	0.05
NEPM 2013 GILs, Fresh Waters								3.4			0.2			1.4			0.06

Field_ID	LocCode	Sampled_Date	Report_Number																	
DUP	PZ01	19/06/2013	92553	600	-	6	400	210	1300	-	<1	0.2	1	<1	8.6	<1	<1	47	38	<0.05
PZ01	PZ01	19/06/2013	92553	700	-	6	410	220	1300	-	<1	0.2	1	<1	8.5	<1	<1	46	38	<0.05
PZ01	PZ201	24/03/2013	88098	1000	<0.005	5.5	600	260	1800	1	<1	0.87	<1	<1	9.9	<1	<1	61	68	<0.05
PZ06	PZ06	24/03/2013	88098	2100	<0.005	4.6	1100	240	5200	2.1	<1	22	5	0.4	8.9	<1	3	140	200	<0.05
PZ06	PZ06	19/06/2013	92553	1300	-	5.2	1200	400	4300	-	<1	4.6	6	<1	8.4	<1	<1	160	170	<0.05
PZ09	PZ09	19/06/2013	92553	1200	-	3.8	210	170	710	-	<1	10	<1	<1	2.6	1	85	4.1	13	0.2
PZ09	PZ209	24/03/2013	88098	3000	<0.005	4.3	160	130	580	2.5	<1	29	<1	0.3	10	<1	110	14	12	0.11
PZ102	PZ102	24/03/2013	88098	900	<0.005	4.4	900	120	3200	0.9	<1	38	<1	1.5	16	<1	230	65	110	<0.05
PZ102	PZ102	19/06/2013	92553	8100	-	5.7	120	43	390	-	<1	29	1	<1	4.7	2	260	16	5	<0.05
PZ103	PZ103	24/03/2013	88098	1800	<0.005	5.8	450	290	1200	1.8	<1	1.5	1	<1	3.6	<1	<1	32	32	<0.05
PZ103	PZ103	19/06/2013	92553	1200	-	6.6	130	100	630	-	<1	2.3	2	<1	5.3	1	4	9.9	7.9	<0.05
PZ107	PZ107	24/03/2013	88098	2800	<0.005	4	1300	320	4300	2.8	<1	60	10	0.6	5	3	1000	5.4	180	<0.05
PZ107	PZ107	19/06/2013	92553	2000	-	3.5	1300	420	4600	-	<1	60	3	0.5	2	2	430	6	160	<0.05
PZ112	PZ112	24/03/2013	88098	2000	<0.005	4.3	970	200	3400	1.9	11	28	<1	2	33	<1	130	20	100	<0.05
PZ112	PZ112	19/06/2013	92553	1500	-	3.9	900	340	2600	-	7	31	<1	2.1	11	2	220	9.6	92	<0.05
PZ24	PZ24	24/03/2013	88098	900	<0.005	3.4	1000	280	3600	0.9	4	34	1	1.7	3	3	3	46	160	<0.05
PZ24	PZ24	19/06/2013	92553	800	-	3.5	1000	250	3900	-	4	33	1	1.8	3.2	4	4	45	150	<0.05
PZ31	PZ31	19/06/2013	92553	1600	-	5.9	280	120	2000	-	<1	1.4	2	<1	3.7	1	3	29	25	<0.05
PZ31	PZ32	24/03/2013	88098	1600	<0.005	6.2	200	78	610	1.6	<1	0.69	3	<1	5.9	1	2	3.5	16	<0.05

	Nickel (Filtered)	Phosphorus	Potassium (Filtered)	Selenium (Filtered)	Zinc (Filtered)	Organochlorine Pesticides																
						4,4-DDE	α-BHC	Aldrin	Aldrin + Dieldrin	β-BHC	Chlordane (cis)	Chlordane (trans)	δ-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde
	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	1	0.05	0.5	1	1	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
NEPM 2013 GILs, Fresh Waters	11			5	8										0.006						0.01	

Field_ID	LocCode	Sampled_Date	Report_Number																				
DUP	PZ01	19/06/2013	92553	66	<0.05	6.7	-	91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ01	PZ01	19/06/2013	92553	66	<0.05	6.7	-	87	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ01	PZ201	24/03/2013	88098	110	<0.05	8.8	<1	260	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ06	PZ06	24/03/2013	88098	250	0.3	13	<1	1100	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ06	PZ06	19/06/2013	92553	410	0.08	12	-	1700	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ09	19/06/2013	92553	9	<0.05	1.4	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ209	24/03/2013	88098	15	0.3	2.1	<1	37	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ102	PZ102	24/03/2013	88098	200	0.4	12	<1	790	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ102	PZ102	19/06/2013	92553	12	0.5	3.2	-	990	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ103	PZ103	24/03/2013	88098	63	0.7	5	<1	250	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ103	PZ103	19/06/2013	92553	14	0.3	2.5	-	270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ107	PZ107	24/03/2013	88098	84	0.1	11	<1	650	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ107	PZ107	19/06/2013	92553	64	0.1	6.6	-	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ112	PZ112	24/03/2013	88098	110	0.1	6.3	<1	330	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ112	PZ112	19/06/2013	92553	210	0.1	4.4	-	620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ24	PZ24	24/03/2013	88098	120	<0.05	4.8	<1	750	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
PZ24	PZ24	19/06/2013	92553	120	0.05	4.6	-	900	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ31	PZ31	19/06/2013	92553	28	<0.05	3.3	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ31	PZ32	24/03/2013	88098	19	<0.05	2.9	<1	280	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

	Organophosphorous Pesticides												PAH/Phenols										
	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dimethoate	Ethion	Fenitrothion	Ronnel	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Carcinogenic PAHs as B(a)P TPE	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL	0.2	0.2	0.2	0.2	0.2	0.2	0.0002	0.2	0.2	0.2	0.2	0.2	1	1	1	1	1		2	1	1	1	1
NEPM 2013 GILs, Fresh Waters	0.2	0.01				0.01		0.01	0.15		0.2												

Field_ID	LocCode	Sampled_Date	Report_Number																				
DUP	PZ01	19/06/2013	92553	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ01	PZ01	19/06/2013	92553	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ01	PZ201	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ06	PZ06	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ06	PZ06	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ09	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ209	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ102	PZ102	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ102	PZ102	19/06/2013	92553	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ103	PZ103	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ103	PZ103	19/06/2013	92553	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ107	PZ107	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ107	PZ107	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ112	PZ112	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<1	<1	<1	<1	<1	<1	<1
PZ112	PZ112	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ24	PZ24	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-
PZ24	PZ24	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ31	PZ31	19/06/2013	92553	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<2.22	<2	<1	<1	<1	<1
PZ31	PZ32	24/03/2013	88098	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.0002	<0.2	<0.2	<0.2	<0.2	<0.2	-	-	-	-	-	-	-	-



						Polychlorinated Biphenyls							TPH									
	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
EQL	1	1	1	1	1	2	2	2	2	2	2	2	0.05	0.1	0.1	0.05	10	50	100	100		0.01
NEPM 2013 GILs, Fresh Waters			16						0.3		0.01											

Field_ID	LocCode	Sampled_Date	Report_Number																					
DUP	PZ01	19/06/2013	92553	<1	<1	<1	<1	<1	-	-	-	-	-	-	<0.05	<0.1	<0.1	<0.05	<10	<50	<100	<100	<250	<0.01
PZ01	PZ01	19/06/2013	92553	<1	<1	<1	<1	<1	-	-	-	-	-	-	<0.05	<0.1	<0.1	<0.05	<10	<50	<100	<100	<250	<0.01
PZ01	PZ201	24/03/2013	88098	<1	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<0.05	<0.1	<0.1	-	<10	<50	<100	<100	<250	0.022
PZ06	PZ06	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ06	PZ06	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ09	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ09	PZ209	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ102	PZ102	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ102	PZ102	19/06/2013	92553	<1	<1	<1	<1	<1	-	-	-	-	-	-	<0.05	<0.1	<0.1	-	<100	<50	<100	<100	<250	<0.1
PZ103	PZ103	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ103	PZ103	19/06/2013	92553	<1	<1	<1	<1	<1	-	-	-	-	-	-	<0.05	<0.1	<0.1	<0.05	<10	<50	<100	<100	<250	<0.01
PZ107	PZ107	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ107	PZ107	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ112	PZ112	24/03/2013	88098	<1	<1	<1	<1	<1	<2	<2	<2	<2	<2	<2	<0.05	<0.1	<0.1	-	<10	<50	<100	<100	<250	<0.01
PZ112	PZ112	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ24	PZ24	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-
PZ24	PZ24	19/06/2013	92553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PZ31	PZ31	19/06/2013	92553	<1	<1	<1	<1	<1	-	-	-	-	-	-	<0.05	<0.1	<0.1	<0.05	<10	<50	<100	<100	<250	<0.01
PZ31	PZ32	24/03/2013	88098	-	-	-	-	-	<2	<2	<2	<2	<2	<2	-	-	-	-	-	-	-	-	-	-

SDG			OLAB 2014-10-03T00:00:00			ENVIROLAB 2014-10-03T00:00:00			ENVIROLAB 2014-10-09T00:00:00		
Field_ID			TP35A	QC1	RPD	TP32	QC5	RPD	TP08	QC7	
Sampled_Date-Time			2/10/2014	2/10/2014		3/10/2014	3/10/2014		9/10/2014	9/10/2014	
Chem_Group	ChemName	Units	EQL								
	Benzo(a)pyrene TEQ NEPM B1	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5
	Total Positive PAHs	mg/kg		0.0	0.0	0	0.0	0.0	0		
Asbestos	Asbestos fibres	-									
BTEX	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2
	Ethylbenzene	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5
	Xylene (m & p)	mg/kg	2 (Primary): 0.5 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0
	Xylene (o)	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0
	C6-C10 less BTEX (F1)	mg/kg	25 (Primary): 10 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0
Inorganics	Moisture	%	0.1 (Primary): 1 (Interlab)	16.0	16.0	0	30.0	33.0	10	15.0	15.0
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)	14.0	14.0	0	29.0	24.0	19	32.0	31.0
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)	6.0	16.0	91	<4.0	<4.0	0	5.0	5.0
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4
	Chromium (III+VI)	mg/kg	1 (Primary): 2 (Interlab)	15.0	24.0	46	12.0	11.0	9	15.0	17.0
	Copper	mg/kg	1 (Primary): 5 (Interlab)	3.0	3.0	0	9.0	8.0	12	5.0	5.0
	Iron	mg/kg	1	2900.0	5700.0	65	4300.0	4100.0	5		
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Nickel	mg/kg	1 (Primary): 2 (Interlab)	<1.0	<1.0	0	2.0	2.0	0	1.0	1.0
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	<1.0	<1.0	0	15.0	13.0	14	19.0	18.0
PAH/Phenols	Acenaphthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Acenaphthylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Benz(a)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.2	0.1
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.5 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	0.26	0.16
	Benzo(b)&(k)fluoranthene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	0.4	0.2
	Benzo(g,h,i)perylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.2	<0.1
	Chrysene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.2	0.1
	Dibenz(a,h)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.3	0.1
	Fluorene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.2	<0.1
	Naphthalene	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	PAHs (Sum of total)	mg/kg								1.9	0.92
	Phenanthrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1
	Pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.3	0.2
TPH	C10-C16	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0
	C16-C34	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0
	C34-C40	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	100.0	110.0
	F2-NAPHTHALENE	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0
	C6 - C9	mg/kg	25 (Primary): 10 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0
	C10 - C14	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0
	C15 - C28	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0
	C29-C36	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0	220.0	200.0
	C6-C10	mg/kg	25 (Primary): 10 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

SDG				00:00				00:00				00:00				00:00			
Field_ID				RPD				RPD				RPD				RPD			
Sampled_Date-Time				TP47				QC9				TP47				QC10			
				13/10/2014				13/10/2014				13/10/2014				13/10/2014			
Chem_Group	ChemName	Units	EQL																
	Benzo(a)pyrene TEQ NEPM B1	mg/kg	0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	<0.5
	Total Positive PAHs	mg/kg																	0.0
Asbestos	Asbestos fibres	-			0.0	0.0	0	0.0											
BTEX	Benzene	mg/kg	0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	<0.2
	Ethylbenzene	mg/kg	1 (Primary): 0.5 (Interlab)	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	<1.0
	Toluene	mg/kg	0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	<0.5
	Xylene (m & p)	mg/kg	2 (Primary): 0.5 (Interlab)	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	<2.0
	Xylene (o)	mg/kg	1 (Primary): 0.5 (Interlab)	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	<1.0
	C6-C10 less BTEX (F1)	mg/kg	25 (Primary): 10 (Interlab)	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	<25.0
Inorganics	Moisture	%	0.1 (Primary): 1 (Interlab)	0	8.1	7.3	10	8.1	7.5	8	20.0								
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)	3	14.0	17.0	19	14.0	23.0	49	13.0								
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)	0	<4.0	<4.0	0	<4.0	<4.0	0	<4.0	<4.0	0	<4.0	<4.0	0	<4.0	<4.0	<4.0
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	<0.4
	Chromium (III+VI)	mg/kg	1 (Primary): 2 (Interlab)	13	12.0	15.0	22	12.0	14.0	15	12.0								
	Copper	mg/kg	1 (Primary): 5 (Interlab)	0	8.0	10.0	22	8.0	15.0	61	12.0								
	Iron	mg/kg	1		8600.0	11000.0	24	8600.0	12000.0	33	2900.0								
	Mercury	mg/kg	0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Nickel	mg/kg	1 (Primary): 2 (Interlab)	0	6.0	7.0	15	6.0	8.0	29	1.0								
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	5	43.0	36.0	18	43.0	46.0	7	7.0								
PAH/Phenols	Acenaphthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Acenaphthylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Benz(a)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	67	0.1	0.1	0	0.1	0.1	0	<0.1								
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.5 (Interlab)	48	0.14	0.12	15	0.14	0.12	15	<0.05								
	Benzo(b)&(k)fluoranthene	mg/kg	0.2	67	0.2	0.2	0	0.2	0.2	0	<0.2								
	Benzo(g,h,i)perylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	67	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Chrysene	mg/kg	0.1 (Primary): 0.5 (Interlab)	67	0.1	0.1	0	0.1	0.1	0	<0.1								
	Dibenz(a,h)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	100	0.2	0.2	0	0.2	0.2	0	<0.1								
	Fluorene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	67	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Naphthalene	mg/kg	1 (Primary): 0.5 (Interlab)	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	<1.0
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	PAHs (Sum of total)	mg/kg		70	0.96	0.98	2	0.96	1.2	22	<0.1								
	Phenanthrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	0	<0.1	<0.1	0	<0.1	0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	<0.1
	Pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	40	0.2	0.2	0	0.2	0.2	0	<0.1								
TPH	C10-C16	mg/kg	50	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	<50.0
	C16-C34	mg/kg	100	17	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	<100.0
	C34-C40	mg/kg	100	10	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	<100.0
	F2-NAPHTHALENE	mg/kg	50	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	<50.0
	C6 - C9	mg/kg	25 (Primary): 10 (Interlab)	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	<25.0
	C10 - C14	mg/kg	50	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	<50.0
	C15 - C28	mg/kg	100	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	<100.0
	C29-C36	mg/kg	100	10	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	<100.0
	C6-C10	mg/kg	25 (Primary): 10 (Interlab)	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	<25.0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL)

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any met

SDG				OLAB 2014-10-14T00:00:00		ENVIROLAB 2014-10-03T00		Interlab_D		ENVIROLAB 2014-10-03T00		Interlab_D		ENVIROLAB 2014-10-03T00	
Field_ID				QC11		TP35A		QC2		TP32		QC6		TP32	
Sampled_Date-Time				9/10/2014		2/10/2014		2/10/2014		3/10/2014		3/10/2014		3/10/2014	
				RPD		RPD		RPD		RPD		RPD		RPD	
Chem_Group	ChemName	Units	EQL												
	Benzo(a)pyrene TEQ NEPM B1	mg/kg	0.5	<0.5	0	<0.5				<0.5					
	Total Positive PAHs	mg/kg		0.0	0	0.0				0.0					
Asbestos	Asbestos fibres	-													
BTEX	Benzene	mg/kg	0.2	<0.2	0	<0.2				<0.2		<0.2		0	
	Ethylbenzene	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	0	<1.0		<0.5	0	<1.0		<0.5		0	
	Toluene	mg/kg	0.5	<0.5	0	<0.5		<0.5	0	<0.5		<0.5		0	
	Xylene (m & p)	mg/kg	2 (Primary): 0.5 (Interlab)	<2.0	0	<2.0		<0.5	0	<2.0		<0.5		0	
	Xylene (o)	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	0	<1.0		<0.5	0	<1.0		<0.5		0	
	C6-C10 less BTEX (F1)	mg/kg	25 (Primary): 10 (Interlab)	<25.0	0	<25.0		<10.0	0	<25.0		<10.0		0	
Inorganics	Moisture	%	0.1 (Primary): 1 (Interlab)	20.0	0	16.0		15.9	1	30.0		33.8		12	
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)	14.0	7	14.0		17.0	19	29.0		28.0		4	
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)	<4.0	0	6.0		12.0	67	<4.0		<5.0		0	
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)	<0.4	0	<0.4		<1.0	0	<0.4		<1.0		0	
	Chromium (III+VI)	mg/kg	1 (Primary): 2 (Interlab)	13.0	8	15.0		19.0	24	12.0		10.0		18	
	Copper	mg/kg	1 (Primary): 5 (Interlab)	14.0	15	3.0		<5.0	0	9.0		8.0		12	
	Iron	mg/kg	1	3700.0	24	2900.0				4300.0					
	Mercury	mg/kg	0.1	<0.1	0	<0.1		<0.1	0	<0.1		<0.1		0	
	Nickel	mg/kg	1 (Primary): 2 (Interlab)	1.0	0	<1.0		<2.0	0	2.0		<2.0		0	
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	8.0	13	<1.0		<5.0	0	15.0		14.0		7	
PAH/Phenols	Acenaphthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Acenaphthylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Benz(a)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.5 (Interlab)	<0.05	0	<0.05		<0.5	0	<0.05		<0.5		0	
	Benzo(b)&(k)fluoranthene	mg/kg	0.2	<0.2	0	<0.2				<0.2					
	Benzo(g,h,i)perylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Chrysene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Dibenz(a,h)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Fluorene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Naphthalene	mg/kg	1 (Primary): 0.5 (Interlab)	<1.0	0	<1.0		<0.5	0	<1.0		<0.5		0	
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	PAHs (Sum of total)	mg/kg													
	Phenanthrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
	Pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	0	<0.1		<0.5	0	<0.1		<0.5		0	
TPH	C10-C16	mg/kg	50	<50.0	0	<50.0		<50.0	0	<50.0		<50.0		0	
	C16-C34	mg/kg	100	<100.0	0	<100.0		<100.0	0	<100.0		<100.0		0	
	C34-C40	mg/kg	100	<100.0	0	<100.0		<100.0	0	<100.0		<100.0		0	
	F2-NAPHTHALENE	mg/kg	50	<50.0	0	<50.0		<50.0	0	<50.0		<50.0		0	
	C6 - C9	mg/kg	25 (Primary): 10 (Interlab)	<25.0	0	<25.0		<10.0	0	<25.0		<10.0		0	
	C10 - C14	mg/kg	50	<50.0	0	<50.0		<50.0	0	<50.0		<50.0		0	
	C15 - C28	mg/kg	100	<100.0	0	<100.0		<100.0	0	<100.0		<100.0		0	
	C29-C36	mg/kg	100	<100.0	0	<100.0		<100.0	0	<100.0		<100.0		0	
	C6-C10	mg/kg	25 (Primary): 10 (Interlab)	<25.0	0	<25.0		<10.0	0	<25.0		<10.0		0	

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL)

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any mett

			SDG	OLAB 2014-10-09T0C		Interlab_D	RPD
			Field_ID	TP08		QC8	
			Sampled_Date-Time	9/10/2014		9/10/2014	
Chem_Group	ChemName	Units	EQL				
	Benzo(a)pyrene TEQ NEPM B1	mg/kg	0.5		<0.5		
	Total Positive PAHs	mg/kg					
Asbestos	Asbestos fibres	-					
BTEX	Benzene	mg/kg	0.2		<0.2	<0.2	0
	Ethylbenzene	mg/kg	1 (Primary): 0.5 (Interlab)		<1.0	<0.5	0
	Toluene	mg/kg	0.5		<0.5	<0.5	0
	Xylene (m & p)	mg/kg	2 (Primary): 0.5 (Interlab)		<2.0	<0.5	0
	Xylene (o)	mg/kg	1 (Primary): 0.5 (Interlab)		<1.0	<0.5	0
	C6-C10 less BTEX (F1)	mg/kg	25 (Primary): 10 (Interlab)		<25.0	<10.0	0
Inorganics	Moisture	%	0.1 (Primary): 1 (Interlab)		15.0	16.1	7
Lead	Lead	mg/kg	1 (Primary): 5 (Interlab)		32.0	37.0	14
Metals	Arsenic	mg/kg	4 (Primary): 5 (Interlab)		5.0	<5.0	0
	Cadmium	mg/kg	0.4 (Primary): 1 (Interlab)		<0.4	<1.0	0
	Chromium (III+VI)	mg/kg	1 (Primary): 2 (Interlab)		15.0	12.0	22
	Copper	mg/kg	1 (Primary): 5 (Interlab)		5.0	8.0	46
	Iron	mg/kg	1				
	Mercury	mg/kg	0.1		<0.1	<0.1	0
	Nickel	mg/kg	1 (Primary): 2 (Interlab)		1.0	<2.0	0
	Zinc	mg/kg	1 (Primary): 5 (Interlab)		19.0	20.0	5
PAH/Phenols	Acenaphthene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Acenaphthylene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Benz(a)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.2	<0.5	0
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.5 (Interlab)		0.26	<0.5	0
	Benzo(b)&(k)fluoranthene	mg/kg	0.2		0.4		
	Benzo(g,h,i)perylene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.2	<0.5	0
	Chrysene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.2	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.3	<0.5	0
	Fluorene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.2	<0.5	0
	Naphthalene	mg/kg	1 (Primary): 0.5 (Interlab)		<1.0	<0.5	0
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)		<0.1	<0.5	0
	PAHs (Sum of total)	mg/kg			1.9	<0.5	0
	Phenanthrene	mg/kg	0.1 (Primary): 0.5 (Interlab)		<0.1	<0.5	0
	Pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)		0.3	<0.5	0
TPH	C10-C16	mg/kg	50		<50.0	<50.0	0
	C16-C34	mg/kg	100		250.0	130.0	63
	C34-C40	mg/kg	100		100.0	<100.0	0
	F2-NAPHTHALENE	mg/kg	50		<50.0	<50.0	0
	C6 - C9	mg/kg	25 (Primary): 10 (Interlab)		<25.0	<10.0	0
	C10 - C14	mg/kg	50		<50.0	<50.0	0
	C15 - C28	mg/kg	100		<100.0	<100.0	0
	C29-C36	mg/kg	100		220.0	<100.0	75
	C6-C10	mg/kg	25 (Primary): 10 (Interlab)		<25.0	<10.0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any metf



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Table C4 Water RPD Table

Field Duplicates (water)
Filter: Lab_Report_Number in('92553')

SDG	ENVIROLAB 2013-06-19T00:00:00	ENVIROLAB 2013-06-19T00:00:00	
Field_ID	PZ01	DUP	RPD
Sampled_Date-Time	19/06/2013	19/06/2013	

Chem_Group	ChemName	Units	EQL			
	Acidity	mg/l	5	120.0	96.0	22
	Carbonate as CaCO3	mg/l	5	<5.0	<5.0	0
BTEX	Benzene	µg/L	1	<1.0	<1.0	0
	Ethylbenzene	µg/L	1	<1.0	<1.0	0
	Toluene	µg/L	1	<1.0	<1.0	0
	Xylene (m & p)	µg/L	2	<2.0	<2.0	0
	Xylene (o)	µg/L	1	<1.0	<1.0	0
	C6-C10 less BTEX (F1)	mg/l	0.01	<0.01	<0.01	0
Field	Alkalinity (total)	mg/l	5	92.0	77.0	18
Inorganics	Ammonia	mg/l	0.005	0.088	0.089	1
	Bicarbonate as CaCO3	mg/l	5	92.0	77.0	18
	Chloride	mg/l	1	550.0	580.0	5
	Electrical conductivity *(lab)	µS/cm	1	2200.0	2200.0	0
	Hydroxide	µg/l	5000	<5000.0	<5000.0	0
	Ionic Balance	%		-1.2	-2.4	NA
	Nitrate (as N)	mg/l	0.005	0.037	0.043	15
	Nitrite (as N)	mg/l	0.005	<0.005	<0.005	0
	Nitrogen (Total)	µg/l	100	700.0	600.0	15
	pH (Lab)	pH Units		6.0	6.0	0
	Sodium (Filtered)	mg/l	0.5	410.0	400.0	2
	Sulphate	mg/l	1	220.0	210.0	5
	TDS	mg/l	5	1300.0	1300.0	0
Lead	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
Metals	Aluminium	mg/l	0.01	0.2	0.2	0
	Arsenic (Filtered)	mg/l	0.001	0.001	0.001	0
	Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
	Calcium (Filtered)	mg/l	0.5	8.5	8.6	1
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0
	Iron	mg/l	0.01	46.0	47.0	2
	Magnesium (Filtered)	mg/l	0.5	38.0	38.0	0
	Mercury (Filtered)	mg/l	0.00005	<0.0001	<0.0001	0
	Nickel (Filtered)	mg/l	0.001	0.066	0.066	0
	Phosphorus	mg/l	0.05	<0.05	<0.05	0
	Potassium (Filtered)	mg/l	0.5	6.7	6.7	0
	Zinc (Filtered)	mg/l	0.001	0.087	0.091	4
PAH/Phenols	Acenaphthene	µg/L	1	<1.0	<1.0	0
	Acenaphthylene	µg/L	1	<1.0	<1.0	0
	Anthracene	µg/L	1	<1.0	<1.0	0
	Benz(a)anthracene	µg/L	1	<1.0	<1.0	0
	Benzo(a)pyrene	µg/L	1	<1.0	<1.0	0
	Benzo(b)&(k)fluoranthene	µg/L	2	<2.0	<2.0	0
	Benzo(g,h,i)perylene	µg/L	1	<1.0	<1.0	0
	Chrysene	µg/L	1	<1.0	<1.0	0
	Dibenz(a,h)anthracene	µg/L	1	<1.0	<1.0	0
	Fluoranthene	µg/L	1	<1.0	<1.0	0
	Fluorene	µg/L	1	<1.0	<1.0	0
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1.0	<1.0	0

Filter: Lab_Report_Number in('92553')



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Table C4 Water RPD Table

Field Duplicates (water)
Filter: Lab_Report_Number in('92553')

SDG	ENVIROLAB 2013-06-19T00:00:00	ENVIROLAB 2013-06-19T00:00:00	
Field_ID	PZ01	DUP	RPD
Sampled_Date-Time	19/06/2013	19/06/2013	

	Naphthalene	µg/L	1	<1.0	<1.0	0
	Naphthalene	µg/L	1	<1.0	<1.0	0
	Phenanthrene	µg/L	1	<1.0	<1.0	0
	Pyrene	µg/L	1	<1.0	<1.0	0
TPH	C10-C16	mg/l	0.05	<0.05	<0.05	0
	C16-C34	mg/l	0.1	<0.1	<0.1	0
	C34-C40	mg/l	0.1	<0.1	<0.1	0
	F2-NAPHTHALENE	mg/l	0.05	<0.05	<0.05	0
	C6 - C9	µg/L	10	<10.0	<10.0	0
	C10 - C14	µg/L	50	<50.0	<50.0	0
	C15 - C28	µg/L	100	<100.0	<100.0	0
	C29-C36	µg/L	100	<100.0	<100.0	0
	C6-C10	mg/l	0.01	<0.01	<0.01	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Filter: Lab_Report_Number in('92553')

APPENDIX D

CALIBRATION CERTIFICATE

RENTALS

Equipment Report - MINIRAE 2000 PID

This PID has been performance checked / calibrated* as follows:

Calibration	Actual Value	Reading	Pass?
Zero – fresh air	0.0 ppm	0.0 ppm	☒
Span – Isobutylene	100 ppm	102 ppm	☒
Set Alarm limits to	High	100 ppm	Low 50 ppm
Operations Check			
☒ Performance Check (pump, lamp, sensor & battery voltage check)			
☒ Battery Charged	☒ Filters Check	☒ Spare battery Voltage (5.5v minimum) 6 V	
☒ Electrical Safety Tag attached (AS/NZS 3760)		Tag No: TFNR047	Valid to: 05/03/2015
☒ Bump test / Date: 01/10/2014			

* Calibration gas traceability information is available upon request.

This PID has been performance checked / calibrated* as follows:

Date: 01/10/2014 Checked by: MILENKO

Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
☒	☐	MiniRae 2000 PID / Operational Check, plus Battery Voltage @ 5.4 V
☒	☐	Lamp Voltage @ 10.6 eV Compound Set to: ISOBUTYLENE C/factor: 1
☒	☐	Protective yellow rubber boot
☒	☐	Inlet probe (attached to PID)
☒	☐	Spare water trap filter(s) Qty 1
☒	☐	Charger 240V to 12V 500mA
☒	☐	Instruction Manual behind foam on the lid of case "
☒	☐	Quick Guide Sheet behind foam on the lid of case "
☒	☐	Spare Alkaline Battery Compartment with batteries
☒	☐	Inline Moisture trap Filter Guide Laminated
☒	☐	Calibration regulator & tubing (optional)
☒	☐	Carry Case
☐	☐	Check to confirm electrical safety (tag must be valid)
Processors Signature/ Initials		MS

Quote Reference	CS001452	Condition on return
Customer Ref		
Equipment ID	PID MINSJ	
Equipment serial no.	110006058	
Return Date	/ /	
Return Time		

"We do more than give you great equipment... We give you great solutions!"

APPENDIX E

LABORATORY REPORTS AND CHAIN OF CUSTODY INFORMATION

CERTIFICATE OF ANALYSIS

88098

Client:

SMEC Australia
Level 6, 76 Berry St
North Sydney
NSW 2060

Attention: Bradley Tucker

Sample log in details:

Your Reference:	30011256	
No. of samples:	9 waters	
Date samples received / completed instructions received	27/03/13	/ 27/03/13

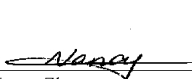
Analysis Details:

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.

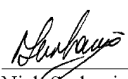
Report Details:

Date results requested by: / Issue Date: 5/04/13 / 5/04/13
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:


Nancy Zhang
Chemist


Rhian Morgan
Reporting Supervisor


Nick Sarlamis
Inorganics Supervisor


Jeremy Faircloth
Chemist

vTRH in Water (C6-C9) NEPM Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-2 PZ112 Water	88098-9 PZ201 Water
Date extracted	-	27/03/2013	27/03/2013
Date analysed	-	28/03/2013	28/03/2013
TRHC ₆ - C ₉	µg/L	<10	<10
TRHC ₆ - C ₁₀	µg/L	<10	22
Surrogate Dibromofluoromethane	%	89	126
Surrogate toluene-d8	%	80	118
Surrogate 4-BFB	%	100	92

svTRH (C10-C40) in Water			
Our Reference:	UNITS	88098-2	88098-9
Your Reference	-----	PZ112	PZ201
Type of sample	-----	Water	Water
Date extracted	-	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013
TRHC ₁₀ - C ₁₄	µg/L	<50	<50
TRHC ₁₅ - C ₂₈	µg/L	<100	<100
TRHC ₂₉ - C ₃₆	µg/L	<100	<100
TRH>C ₁₀ - C ₁₆	µg/L	<50	<50
TRH>C ₁₆ - C ₃₄	µg/L	<100	<100
TRH>C ₃₄ - C ₄₀	µg/L	<100	<100
Surrogate o-Terphenyl	%	107	92

PAHs in Water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-2 PZ112 Water	88098-9 PZ201 Water
Date extracted	-	28/03/2013	28/03/2013
Date analysed	-	05/04/2013	05/04/2013
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b+k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Surrogate <i>p</i> -Terphenyl-d14	%	113	92

OCP in water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
HCB	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	87	96	86	83	83

OCP in water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
HCB	µg/L	<0.2	<0.2	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	92	82	97	88

OP Pesticides in water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Diazinon	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	87	96	86	83	83

OP Pesticides in water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Diazinon	µg/L	<0.2	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos-methyl	µg/L	<0.2	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos	µg/L	<0.2	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2	<0.2
Surrogate TCMX	%	92	82	97	88

PCBs in Water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Arochlor 1016	µg/L	<2	<2	<2	<2	<2
Arochlor 1221	µg/L	<2	<2	<2	<2	<2
Arochlor 1232	µg/L	<2	<2	<2	<2	<2
Arochlor 1242	µg/L	<2	<2	<2	<2	<2
Arochlor 1248	µg/L	<2	<2	<2	<2	<2
Arochlor 1254	µg/L	<2	<2	<2	<2	<2
Arochlor 1260	µg/L	<2	<2	<2	<2	<2
Surrogate TCLMX	%	87	96	86	83	83

PCBs in Water Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date extracted	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Arochlor 1016	µg/L	<2	<2	<2	<2
Arochlor 1221	µg/L	<2	<2	<2	<2
Arochlor 1232	µg/L	<2	<2	<2	<2
Arochlor 1242	µg/L	<2	<2	<2	<2
Arochlor 1248	µg/L	<2	<2	<2	<2
Arochlor 1254	µg/L	<2	<2	<2	<2
Arochlor 1260	µg/L	<2	<2	<2	<2
Surrogate TCLMX	%	92	82	97	88

HM in water - dissolved Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date prepared	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Arsenic-Dissolved	µg/L	<1	<1	5	10	1
Cadmium-Dissolved	µg/L	0.3	2.0	0.4	0.6	1.7
Chromium-Dissolved	µg/L	<1	<1	<1	3	3
Copper-Dissolved	µg/L	110	130	3	1,000	3
Lead-Dissolved	µg/L	<1	11	<1	<1	4
Mercury-Dissolved	µg/L	0.11	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	15	110	250	84	120
Zinc-Dissolved	µg/L	37	330	1,100	650	750
Selenium-Dissolved	µg/L	<1	<1	<1	<1	<1

HM in water - dissolved Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date prepared	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Arsenic-Dissolved	µg/L	3	<1	1	<1
Cadmium-Dissolved	µg/L	<0.1	1.5	<0.1	<0.1
Chromium-Dissolved	µg/L	1	<1	<1	<1
Copper-Dissolved	µg/L	2	230	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	19	200	63	110
Zinc-Dissolved	µg/L	280	790	250	260
Selenium-Dissolved	µg/L	<1	<1	<1	<1

Miscellaneous Inorganics Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date prepared	-	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013
Date analysed	-	02/04/2013	02/04/2013	02/04/2013	02/04/2013	02/04/2013
pH	pH Units	4.3	4.3	4.6	4.0	3.4
Acidity as CaCO ₃	mg/L	340	170	280	390	390
Ammonia as N in water	mg/L	0.055	0.11	0.29	0.26	0.16
Total Dissolved Solids (grav)	mg/L	580	3,400	5,200	4,300	3,600
Electrical Conductivity	µS/cm	800	4,600	6,500	6,900	6,000
Total Nitrogen in water	mg/L	3.0	2.0	2.1	2.8	0.9
TKN in water	mg/L	2.5	1.9	2.1	2.8	0.9
Nitrate as N in water	mg/L	0.55	0.049	<0.005	<0.005	0.012
Nitrite as N in water	mg/L	<0.005	0.008	<0.005	0.006	<0.005
Fluoride, F	mg/L	<0.1	0.39	0.28	0.26	0.34
Phosphate as P in water	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus - Total	mg/L	0.3	0.1	0.3	0.1	<0.05

Miscellaneous Inorganics Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date prepared	-	02/04/2013	02/04/2013	02/04/2013	02/04/2013
Date analysed	-	02/04/2013	02/04/2013	02/04/2013	02/04/2013
pH	pH Units	6.2	4.4	5.8	5.5
Acidity as CaCO ₃	mg/L	35	230	200	210
Ammonia as N in water	mg/L	0.11	0.26	0.052	0.049
Total Dissolved Solids (grav)	mg/L	610	3,200	1,200	1,800
Electrical Conductivity	µS/cm	990	4,500	2,100	3,000
Total Nitrogen in water	mg/L	1.6	0.9	1.8	1.0
TKN in water	mg/L	1.6	0.9	1.8	1.0
Nitrate as N in water	mg/L	<0.005	0.035	0.014	0.019
Nitrite as N in water	mg/L	0.01	<0.005	<0.005	<0.005
Fluoride, F	mg/L	<0.1	0.48	0.47	0.24
Phosphate as P in water	mg/L	<0.005	<0.005	<0.005	<0.005
Phosphorus - Total	mg/L	<0.05	0.4	0.7	<0.05

HM in water - total	UNITS	88098-1	88098-2	88098-3	88098-4	88098-5
Our Reference:	-----	PZ209	PZ112	PZ06	PZ107	PZ24
Your Reference	-----	Water	Water	Water	Water	Water
Type of sample						
Date prepared	-	28/3/2013	28/3/2013	28/3/2013	28/3/2013	28/3/2013
Date analysed	-	28/3/2013	28/3/2013	28/3/2013	28/3/2013	28/3/2013
Aluminium-Total	µg/L	29,000	28,000	22,000	60,000	34,000
Iron-Total	µg/L	14,000	20,000	140,000	5,400	46,000

HM in water - total	UNITS	88098-6	88098-7	88098-8	88098-9
Our Reference:	-----	PZ32	PZ102	PZ103	PZ201
Your Reference	-----	Water	Water	Water	Water
Type of sample					
Date prepared	-	28/3/2013	28/3/2013	28/3/2013	28/3/2013
Date analysed	-	28/3/2013	28/3/2013	28/3/2013	28/3/2013
Aluminium-Total	µg/L	690	38,000	1,500	870
Iron-Total	µg/L	3,500	65,000	32,000	61,000

Ion Balance Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-1 PZ209 Water	88098-2 PZ112 Water	88098-3 PZ06 Water	88098-4 PZ107 Water	88098-5 PZ24 Water
Date prepared	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Calcium - Dissolved	mg/L	10	33	8.9	5.0	3.0
Potassium - Dissolved	mg/L	2.1	6.3	13	11	4.8
Sodium - Dissolved	mg/L	160	970	1,100	1,300	1,000
Magnesium - Dissolved	mg/L	12	100	200	180	160
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Sulphate, SO ₄	mg/L	130	200	240	320	280
Chloride, Cl	mg/L	170	1,400	2,200	2,400	2,100
Ionic Balance	%	6.1	8.2	-1.1	-2.4	-5.0

Ion Balance Our Reference: Your Reference Type of sample	UNITS ----- -----	88098-6 PZ32 Water	88098-7 PZ102 Water	88098-8 PZ103 Water	88098-9 PZ201 Water
Date prepared	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Date analysed	-	28/03/2013	28/03/2013	28/03/2013	28/03/2013
Calcium - Dissolved	mg/L	5.9	16	3.6	9.9
Potassium - Dissolved	mg/L	2.9	12	5.0	8.8
Sodium - Dissolved	mg/L	200	900	450	600
Magnesium - Dissolved	mg/L	16	110	32	68
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	57	<5	91	32
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	57	<5	91	32
Sulphate, SO ₄	mg/L	78	120	290	260
Chloride, Cl	mg/L	230	1,500	440	830
Ionic Balance	%	4.9	4.9	5.4	5.1

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)-BTEX as per NEPM B1 draft Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly 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 draft 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 draft B1 Guideline on Investigation Levels for Soil and Groundwater.
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.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 22nd ED, 4500-H+.
Inorg-005	Acidity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA 22nd ED 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-5oC.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 22nd ED 2510 and Rayment & Lyons.
Inorg-055/062	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen.
Inorg-062	TKN - determined colourimetrically based on APHA 22nd ED 4500 Norg.
Inorg-055	Nitrate - determined colourimetrically based on EPA353.2 and APHA 22nd ED NO3- F. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on EPA353.2 and APHA 22nd ED NO2- B. Soils are analysed following a water extraction.
Inorg-026	Fluoride determined by ion selective electrode (ISE) in accordance with APHA 22nd ED, 4500-F-C.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA 22nd ED 4500 P E. Soils are analysed following a water extraction.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.

Method ID	Methodology Summary
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110-B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH in Water (C6-C9) NEPM						Base II Duplicate II %RPD		
Date extracted	-			27/03/2013	[NT]	[NT]	LCS-W1	27/03/2013
Date analysed	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
TRHC ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	118%
TRHC ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	118%
Surrogate Dibromofluoromethane	%		Org-013	98	[NT]	[NT]	LCS-W1	116%
Surrogate toluene-d8	%		Org-013	96	[NT]	[NT]	LCS-W1	95%
Surrogate 4-BFB	%		Org-013	92	[NT]	[NT]	LCS-W1	99%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
TRHC ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	118%
TRHC ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	121%
TRHC ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	96%
TRH>C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	118%
TRH>C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	121%
TRH>C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	96%
Surrogate o-Terphenyl	%		Org-003	88	[NT]	[NT]	LCS-W1	104%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Date analysed	-			05/04/2013	[NT]	[NT]	LCS-W1	05/04/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	78%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	81%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	76%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	81%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	82%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	72%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	92%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene TEQ	µg/L	5	Org-012 subset	5	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	109	[NT]	[NT]	LCS-W1	100%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
OCP in water						Base II Duplicate II %RPD		
Date extracted	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	78%
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	80%
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	81%
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	78%
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	83%
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	80%
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	82%
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	75%
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	87%
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	84%
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	84	[NT]	[NT]	LCS-W1	92%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
OP Pesticides in water						Base II Duplicate II %RPD		
Date extracted	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Diazinon	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Dimethoate	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos-methyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Ronnel	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	72%
Fenitrothion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	75%
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Ethion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	67%
Surrogate TCMX	%		Org-008	84	[NT]	[NT]	LCS-W1	80%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Water						Base II Duplicate II %RPD		
Date extracted	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	[NT]	[NT]	LCS-W1	28/03/2013
Arochlor 1016	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	µg/L	2	Org-006	<2	[NT]	[NT]	LCS-W1	86%
Arochlor 1260	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	84	[NT]	[NT]	LCS-W1	78%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			28/03/2013	88098-1	28/03/2013 28/03/2013	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	88098-1	28/03/2013 28/03/2013	LCS-W1	28/03/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	<1 <1	LCS-W1	97%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	88098-1	0.3 0.3 RPD: 0	LCS-W1	96%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	<1 <1	LCS-W1	88%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	110 100 RPD: 10	LCS-W1	89%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	<1 <1	LCS-W1	87%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	100	88098-1	0.11 0.11 RPD: 0	LCS-W1	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	15 15 RPD: 0	LCS-W1	92%

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	37 35 RPD: 6	LCS-W1	87%
Selenium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	88098-1	<1 <1	LCS-W1	95%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			02/04/2013	88098-1	02/04/2013 02/04/2013	LCS-W1	02/04/2013
Date analysed	-			02/04/2013	88098-1	02/04/2013 02/04/2013	LCS-W1	02/04/2013
pH	pH Units		Inorg-001	[NT]	88098-1	4.3 4.3 RPD: 0	LCS-W1	101%
Acidity as CaCO ₃	mg/L	5	Inorg-005	<5	88098-1	340 330 RPD: 3	LCS-W1	107%
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	88098-1	0.055 0.057 RPD: 4	LCS-W1	96%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	88098-1	580 570 RPD: 2	LCS-W1	96%
Electrical Conductivity	µS/cm	1	Inorg-002	<1	88098-1	800 850 RPD: 6	LCS-W1	112%
Total Nitrogen in water	mg/L	0.1	Inorg-055/062	<0.1	88098-1	3.0 2.9 RPD: 3	LCS-W1	99%
TKN in water	mg/L	0.1	Inorg-062	<0.1	88098-1	2.5 2.3 RPD: 8	LCS-W1	99%
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	88098-1	0.55 0.55 RPD: 0	LCS-W1	101%
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	88098-1	<0.005 <0.005	LCS-W1	101%
Fluoride, F	mg/L	0.1	Inorg-026	<0.1	88098-1	<0.1 <0.1	LCS-W1	103%
Phosphate as P in water	mg/L	0.005	Inorg-060	<0.005	88098-1	<0.005 <0.005	LCS-W1	87%
Phosphorus - Total	mg/L	0.05	Metals-020 ICP-AES	<0.05	88098-1	0.3 0.3 RPD: 0	LCS-W1	93%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results		
HM in water - total						Base II Duplicate II %RPD		
Date prepared	-			[NT]	88098-1	28/3/2013 28/3/2013		
Date analysed	-			[NT]	88098-1	28/3/2013 28/3/2013		
Aluminium-Total	µg/L	10	Metals-022 ICP-MS	<10	88098-1	29000 29000 RPD: 0		
Iron-Total	µg/L	10	Metals-022 ICP-MS	<10	88098-1	14000 14000 RPD: 0		
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			28/03/2013	88098-1	28/03/2013 28/03/2013	LCS-W1	28/03/2013
Date analysed	-			28/03/2013	88098-1	28/03/2013 28/03/2013	LCS-W1	28/03/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	88098-1	10 10 RPD: 0	LCS-W1	101%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	88098-1	2.1 2.1 RPD: 0	LCS-W1	109%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	88098-1	160 160 RPD: 0	LCS-W1	104%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	88098-1	12 12 RPD: 0	LCS-W1	101%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base Duplicate %RPD		
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	88098-1	<5 <5	[NR]	[NR]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	88098-1	<5 <5	[NR]	[NR]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	88098-1	<5 <5	[NR]	[NR]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	88098-1	<5 <5	LCS-W1	101%
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	88098-1	130 130 RPD: 0	LCS-W1	103%
Chloride, Cl	mg/L	1	Inorg-081	<1	88098-1	170 170 RPD: 0	LCS-W1	94%
Ionic Balance	%		Inorg-041	[NT]	88098-1	6.1 5.9 RPD: 3	[NR]	[NR]

QUALITY CONTROL HM in water - dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	88098-2	28/03/2013
Date analysed	-	[NT]	[NT]	88098-2	28/03/2013
Arsenic-Dissolved	µg/L	[NT]	[NT]	88098-2	96%
Cadmium-Dissolved	µg/L	[NT]	[NT]	88098-2	94%
Chromium-Dissolved	µg/L	[NT]	[NT]	88098-2	80%
Copper-Dissolved	µg/L	[NT]	[NT]	88098-2	87%
Lead-Dissolved	µg/L	[NT]	[NT]	88098-2	100%
Mercury-Dissolved	µg/L	[NT]	[NT]	88098-2	96%
Nickel-Dissolved	µg/L	[NT]	[NT]	88098-2	87%
Zinc-Dissolved	µg/L	[NT]	[NT]	88098-2	87%
Selenium-Dissolved	µg/L	[NT]	[NT]	88098-2	100%
QUALITY CONTROL Ion Balance	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	88098-2	28/03/2013
Date analysed	-	[NT]	[NT]	88098-2	28/03/2013
Calcium - Dissolved	mg/L	[NT]	[NT]	88098-2	#
Potassium - Dissolved	mg/L	[NT]	[NT]	88098-2	116%
Sodium - Dissolved	mg/L	[NT]	[NT]	88098-2	#
Magnesium - Dissolved	mg/L	[NT]	[NT]	88098-2	#
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Carbonate Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Total Alkalinity as CaCO ₃	mg/L	[NT]	[NT]	[NR]	[NR]
Sulphate, SO ₄	mg/L	[NT]	[NT]	[NR]	[NR]
Chloride, Cl	mg/L	[NT]	[NT]	[NR]	[NR]
Ionic Balance	%	[NT]	[NT]	[NR]	[NR]

Report Comments:

ION_BALANCE: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos ID was analysed by Approved Identifier:
Asbestos ID was authorised by Approved Signatory:

Not applicable for this job
Not applicable for this job

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

CERTIFICATE OF ANALYSIS

92553

Client:

SMEC Australia
Level 6, 76 Berry St
North Sydney
NSW 2060

Attention: Cara Jacques

Sample log in details:

Your Reference:	30011256	
No. of samples:	10 waters	
Date samples received / completed instructions received	19/06/13	/ 19/06/13

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:	26/06/13	/	26/06/13
Date of Preliminary Report:	Not issued		

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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 Water						
Our Reference:	UNITS	92553-1	92553-2	92553-3	92553-4	92553-5
Your Reference	-----	PZ01	PZ103	PZ31	DUP	PZ102
Date Sampled	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Date analysed	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
TRHC ₆ - C ₉	µg/L	<10	<10	<10	<10	<100
TRHC ₆ - C ₁₀	µg/L	<10	<10	<10	<10	<100
TRHC ₆ - C ₁₀ less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	<10
Toluene	µg/L	<1	<1	<1	<1	<10
Ethylbenzene	µg/L	<1	<1	<1	<1	<10
m+p-xylene	µg/L	<2	<2	<2	<2	<20
o-xylene	µg/L	<1	<1	<1	<1	<10
Naphthalene	µg/L	<1	<1	<1	<1	<10
Surrogate Dibromofluoromethane	%	107	107	107	108	107
Surrogate toluene-d8	%	101	101	101	101	101
Surrogate 4-BFB	%	99	96	97	100	98

svTRH (C10-C40) in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	92553-1 PZ01 19/06/2013 Water	92553-2 PZ103 19/06/2013 Water	92553-3 PZ31 19/06/2013 Water	92553-4 DUP 19/06/2013 Water	92553-5 PZ102 19/06/2013 Water
Date extracted	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	21/06/2013	21/06/2013	21/06/2013	21/06/2013	21/06/2013
TRHC ₁₀ - C ₁₄	µg/L	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	µg/L	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	µg/L	<100	<100	<100	<100	<100
TRH>C ₁₀ - C ₁₆	µg/L	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	µg/L	<50	<50	<50	<50	[NA]
TRH>C ₁₆ - C ₃₄	µg/L	<100	<100	<100	<100	<100
TRH>C ₃₄ - C ₄₀	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	104	93	96	83	61

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	92553-1 PZ01 19/06/2013 Water	92553-2 PZ103 19/06/2013 Water	92553-3 PZ31 19/06/2013 Water	92553-4 DUP 19/06/2013 Water	92553-5 PZ102 19/06/2013 Water
Date extracted	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	21/06/2013	21/06/2013	21/06/2013	21/06/2013	21/06/2013
Naphthalene	µg/L	<1	<1	<1	<1	<1
Acenaphthylene	µg/L	<1	<1	<1	<1	<1
Acenaphthene	µg/L	<1	<1	<1	<1	<1
Fluorene	µg/L	<1	<1	<1	<1	<1
Phenanthrene	µg/L	<1	<1	<1	<1	<1
Anthracene	µg/L	<1	<1	<1	<1	<1
Fluoranthene	µg/L	<1	<1	<1	<1	<1
Pyrene	µg/L	<1	<1	<1	<1	<1
Benzo(a)anthracene	µg/L	<1	<1	<1	<1	<1
Chrysene	µg/L	<1	<1	<1	<1	<1
Benzo(b+k)fluoranthene	µg/L	<2	<2	<2	<2	<2
Benzo(a)pyrene	µg/L	<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1	<1	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5	<5	<5	<5
Surrogate p-Terphenyl-d14	%	93	95	105	80	61

HM in water - dissolved						
Our Reference:	UNITS	92553-1	92553-2	92553-3	92553-4	92553-5
Your Reference	-----	PZ01	PZ103	PZ31	DUP	PZ102
Date Sampled	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Date analysed	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Arsenic-Dissolved	µg/L	1	2	2	1	1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	1	1	<1	2
Copper-Dissolved	µg/L	<1	4	3	<1	260
Lead-Dissolved	µg/L	<1	1	<1	<1	2
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	66	14	28	66	12
Zinc-Dissolved	µg/L	87	270	20	91	990

HM in water - dissolved						
Our Reference:	UNITS	92553-6	92553-7	92553-8	92553-9	92553-10
Your Reference	-----	PZ24	PZ107	PZ06	PZ09	PZ112
Date Sampled	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Date analysed	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Arsenic-Dissolved	µg/L	1	3	6	<1	<1
Cadmium-Dissolved	µg/L	1.8	0.5	<0.1	0.2	2.1
Chromium-Dissolved	µg/L	4	2	<1	1	2
Copper-Dissolved	µg/L	4	430	<1	85	220
Lead-Dissolved	µg/L	4	<1	<1	<1	7
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	0.20	<0.05
Nickel-Dissolved	µg/L	120	64	410	9	210
Zinc-Dissolved	µg/L	900	230	1,700	29	620

Miscellaneous Inorganics						
Our Reference:	UNITS	92553-1	92553-2	92553-3	92553-4	92553-5
Your Reference	-----	PZ01	PZ103	PZ31	DUP	PZ102
Date Sampled	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
pH	pH Units	6.0	6.6	5.9	6.0	5.7
Electrical Conductivity	µS/cm	2,200	770	3,500	2,200	650
Total Dissolved Solids (grav)	mg/L	1,300	630	2,000	1,300	390
Acidity as CaCO ₃	mg/L	120	33	110	96	110
Ammonia as N in water	mg/L	0.088	0.081	0.25	0.089	0.11
Total Nitrogen in water	mg/L	0.7	1.2	1.6	0.6	8.1
Nitrate as N in water	mg/L	0.037	0.073	<0.005	0.043	0.019
Nitrite as N in water	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus - Total	mg/L	<0.05	0.3	<0.05	<0.05	0.5

Miscellaneous Inorganics						
Our Reference:	UNITS	92553-6	92553-7	92553-8	92553-9	92553-10
Your Reference	-----	PZ24	PZ107	PZ06	PZ09	PZ112
Date Sampled	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Type of sample		Water	Water	Water	Water	Water
Date prepared	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
pH	pH Units	3.5	3.5	5.2	3.8	3.9
Electrical Conductivity	µS/cm	6,300	7,400	6,800	1,200	4,900
Total Dissolved Solids (grav)	mg/L	3,900	4,600	4,300	710	2,600
Acidity as CaCO ₃	mg/L	590	400	600	94	210
Ammonia as N in water	mg/L	0.10	0.15	0.21	0.046	0.11
Total Nitrogen in water	mg/L	0.8	2.0	1.3	1.2	1.5
Nitrate as N in water	mg/L	<0.005	<0.005	0.009	0.31	0.031
Nitrite as N in water	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005
Phosphorus - Total	mg/L	0.05	0.1	0.08	<0.05	0.1

HM in water - total	UNITS	92553-1	92553-2	92553-3	92553-4	92553-5
Our Reference:	-----	PZ01	PZ103	PZ31	DUP	PZ102
Your Reference	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Date Sampled		Water	Water	Water	Water	Water
Type of sample						
Date prepared	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Date analysed	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Aluminium-Total	µg/L	200	2,300	1,400	200	29,000
Iron-Total	µg/L	46,000	9,900	29,000	47,000	16,000

HM in water - total	UNITS	92553-6	92553-7	92553-8	92553-9	92553-10
Our Reference:	-----	PZ24	PZ107	PZ06	PZ09	PZ112
Your Reference	-----	19/06/2013	19/06/2013	19/06/2013	19/06/2013	19/06/2013
Date Sampled		Water	Water	Water	Water	Water
Type of sample						
Date prepared	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Date analysed	-	20/6/2013	20/6/2013	20/6/2013	20/6/2013	20/6/2013
Aluminium-Total	µg/L	33,000	60,000	4,600	10,000	31,000
Iron-Total	µg/L	45,000	6,000	160,000	4,100	9,600

Ion Balance Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	92553-1 PZ01 19/06/2013 Water	92553-2 PZ103 19/06/2013 Water	92553-3 PZ31 19/06/2013 Water	92553-4 DUP 19/06/2013 Water	92553-5 PZ102 19/06/2013 Water
Date prepared	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Calcium - Dissolved	mg/L	8.5	5.3	3.7	8.6	4.7
Potassium - Dissolved	mg/L	6.7	2.5	3.3	6.7	3.2
Sodium - Dissolved	mg/L	410	130	280	400	120
Magnesium - Dissolved	mg/L	38	7.9	25	38	5.0
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	92	110	120	77	530
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	92	110	120	77	530
Sulphate, SO ₄	mg/L	220	100	120	210	43
Chloride, Cl	mg/L	550	110	1,100	580	150
Ionic Balance	%	-1.2	-3.6	-40	-2.4	-45

Ion Balance Our Reference: Your Reference Date Sampled Type of sample	UNITS ----- -----	92553-6 PZ24 19/06/2013 Water	92553-7 PZ107 19/06/2013 Water	92553-8 PZ06 19/06/2013 Water	92553-9 PZ09 19/06/2013 Water	92553-10 PZ112 19/06/2013 Water
Date prepared	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Date analysed	-	20/06/2013	20/06/2013	20/06/2013	20/06/2013	20/06/2013
Calcium - Dissolved	mg/L	3.2	2.0	8.4	2.6	11
Potassium - Dissolved	mg/L	4.6	6.6	12	1.4	4.4
Sodium - Dissolved	mg/L	1,000	1,300	1,200	210	900
Magnesium - Dissolved	mg/L	150	160	170	13	92
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Bicarbonate Alkalinity as CaCO ₃	mg/L	<5	<5	1,100	<5	<5
Carbonate Alkalinity as CaCO ₃	mg/L	<5	<5	<5	<5	<5
Total Alkalinity as CaCO ₃	mg/L	<5	<5	1,100	<5	<5
Sulphate, SO ₄	mg/L	250	420	400	170	340
Chloride, Cl	mg/L	2,400	2,500	2,300	260	1,600
Ionic Balance	%	-12	-5.9	-18	-1.8	-4.0

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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-013	Water samples are analysed directly 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.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 22nd ED, 4500-H+.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 22nd ED 2510 and Rayment & Lyons.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-5oC.
Inorg-005	Acidity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-057	Ammonia - determined colourimetrically based on EPA350.1 and APHA 22nd ED 4500-NH3 F, Soils are analysed following a KCl extraction.
Inorg-055/062	Total Nitrogen - Calculation sum of TKN and oxidised Nitrogen.
Inorg-055	Nitrate - determined colourimetrically based on EPA353.2 and APHA 22nd ED NO3- F. Soils are analysed following a water extraction.
Inorg-055	Nitrite - determined colourimetrically based on EPA353.2 and APHA 22nd ED NO2- B. Soils are analysed following a water extraction.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA 22nd ED, 2320-B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 22nd ED, 4110-B.
Inorg-041	Gravimetric determination of the total solids content of water using APHA 22nd ED 2540B.

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Water						Base II Duplicate II %RPD		
Date extracted	-			19/06/2013	[NT]	[NT]	LCS-W1	19/06/2013
Date analysed	-			20/06/2013	[NT]	[NT]	LCS-W1	20/06/2013
TRHC ₆ - C ₉	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	107%
TRHC ₆ - C ₁₀	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	107%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	108%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	108%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	106%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	106%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	105%
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	LCS-W1	103%
Surrogate toluene-d8	%		Org-016	101	[NT]	[NT]	LCS-W1	100%
Surrogate 4-BFB	%		Org-016	104	[NT]	[NT]	LCS-W1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Water						Base II Duplicate II %RPD		
Date extracted	-			20/06/2013	[NT]	[NT]	LCS-W1	20/06/2013
Date analysed	-			21/06/2013	[NT]	[NT]	LCS-W1	21/06/2013
TRHC ₁₀ - C ₁₄	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	113%
TRHC ₁₅ - C ₂₈	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	128%
TRHC ₂₉ - C ₃₆	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	114%
TRH>C ₁₀ - C ₁₆	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	113%
TRH>C ₁₆ - C ₃₄	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	128%
TRH>C ₃₄ - C ₄₀	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	114%
Surrogate o-Terphenyl	%		Org-003	108	[NT]	[NT]	LCS-W1	113%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Date extracted	-			20/06/2013	[NT]	[NT]	LCS-W1	20/06/2013
Date analysed	-			21/06/2013	[NT]	[NT]	LCS-W1	21/06/2013
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	85%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	91%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	79%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Water						Base II Duplicate II %RPD		
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	82%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	88%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	79%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	97%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	104	[NT]	[NT]	LCS-W1	83%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - dissolved						Base II Duplicate II %RPD		
Date prepared	-			20/06/2013	92553-9	20/6/2013 20/6/2013	LCS-W2	20/06/2013
Date analysed	-			20/06/2013	92553-9	20/6/2013 20/6/2013	LCS-W2	20/06/2013
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	<1 <1	LCS-W2	95%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	92553-9	0.2 0.2 RPD: 0	LCS-W2	99%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	1 1 RPD: 0	LCS-W2	91%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	85 85 RPD: 0	LCS-W2	83%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	<1 <1	LCS-W2	104%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	92553-9	0.20 [N/T]	LCS-W2	96%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	9 9 RPD: 0	LCS-W2	87%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	92553-9	29 29 RPD: 0	LCS-W2	89%

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			20/06/2013	92553-1	20/06/2013 20/06/2013	LCS-W1	20/06/2013
Date analysed	-			20/06/2013	92553-1	20/06/2013 20/06/2013	LCS-W1	20/06/2013
pH	pH Units		Inorg-001	[NT]	92553-1	6.0 [N/T]	LCS-W1	101%
Electrical Conductivity	µS/cm	1	Inorg-002	<1	92553-1	2200 [N/T]	LCS-W1	105%
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	92553-1	1300 [N/T]	LCS-W1	95%
Acidity as CaCO ₃	mg/L	5	Inorg-005	<5	92553-1	120 100 RPD: 18	LCS-W1	105%
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	92553-1	0.088 0.088 RPD: 0	LCS-W1	88%
Total Nitrogen in water	mg/L	0.1	Inorg-055/062	<0.1	92553-1	0.7 0.6 RPD: 15	LCS-W1	109%
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	92553-1	0.037 0.039 RPD: 5	LCS-W1	100%
Nitrite as N in water	mg/L	0.005	Inorg-055	<0.005	92553-1	<0.005 <0.005	LCS-W1	101%
Phosphorus - Total	mg/L	0.05	Metals-020 ICP-AES	<0.05	92553-1	<0.05 <0.05	LCS-W1	90%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
HM in water - total						Base II Duplicate II %RPD		
Date prepared	-			20/06/2013	92553-4	20/06/2013 20/06/2013	LCS-W1	20/06/2013
Date analysed	-			20/06/2013	92553-4	20/06/2013 20/06/2013	LCS-W1	20/06/2013
Aluminium-Total	µg/L	10	Metals-022 ICP-MS	<10	92553-4	200 200 RPD: 0	LCS-W1	115%
Iron-Total	µg/L	10	Metals-022 ICP-MS	<10	92553-4	47000 49000 RPD: 4	LCS-W1	99%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base II Duplicate II %RPD		
Date prepared	-			20/06/2013	92553-1	20/06/2013 20/06/2013	LCS-W1	20/06/2013
Date analysed	-			20/06/2013	92553-1	20/06/2013 20/06/2013	LCS-W1	20/06/2013
Calcium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	92553-1	8.5 8.5 RPD: 0	LCS-W1	95%
Potassium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	92553-1	6.7 6.6 RPD: 2	LCS-W1	108%
Sodium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	92553-1	410 400 RPD: 2	LCS-W1	104%
Magnesium - Dissolved	mg/L	0.5	Metals-020 ICP-AES	<0.5	92553-1	38 37 RPD: 3	LCS-W1	92%
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	5	Inorg-006	<5	92553-1	<5 [N/T]	[NR]	[NR]
Bicarbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	92553-1	92 [N/T]	[NR]	[NR]
Carbonate Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	92553-1	<5 [N/T]	[NR]	[NR]
Total Alkalinity as CaCO ₃	mg/L	5	Inorg-006	<5	92553-1	92 [N/T]	LCS-W1	113%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Ion Balance						Base Duplicate %RPD		
Sulphate, SO ₄	mg/L	1	Inorg-081	<1	92553-1	220 220 RPD: 0	LCS-W1	115%
Chloride, Cl	mg/L	1	Inorg-081	<1	92553-1	550 550 RPD: 0	LCS-W1	96%
Ionic Balance	%		Inorg-041	[NT]	92553-1	-1.2 [N/T]	[NR]	[NR]
QUALITY CONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
HM in water - dissolved				Base + Duplicate + %RPD				
Date prepared	-	92553-1		20/6/2013 20/6/2013		92553-2	20/6/2013	
Date analysed	-	92553-1		20/6/2013 20/6/2013		92553-2	20/6/2013	
Mercury-Dissolved	µg/L	92553-1		<0.05 <0.05		92553-2	88%	
QUALITY CONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
Miscellaneous Inorganics				Base + Duplicate + %RPD				
Date prepared	-	92553-2		20/6/2013 20/6/2013		92553-2	20/6/2013	
Date analysed	-	92553-2		20/6/2013 20/6/2013		92553-2	20/6/2013	
pH	pH Units	92553-2		6.6 6.6 RPD: 0		[NR]	[NR]	
Electrical Conductivity	µS/cm	92553-2		770 770 RPD: 0		[NR]	[NR]	
Total Dissolved Solids (grav)	mg/L	92553-2		630 630 RPD: 0		[NR]	[NR]	
Ammonia as N in water	mg/L	92553-2		0.081 [N/T]		92553-2	100%	
Total Nitrogen in water	mg/L	92553-2		1.2 [N/T]		92553-2	116%	
Nitrate as N in water	mg/L	92553-2		0.073 [N/T]		92553-2	82%	
Nitrite as N in water	mg/L	92553-2		<0.005 [N/T]		92553-2	120%	
Phosphorus - Total	mg/L	92553-2		0.3 [N/T]		92553-2	98%	
QUALITY CONTROL	UNITS	Dup. Sm#		Duplicate		Spike Sm#	Spike % Recovery	
Ion Balance				Base + Duplicate + %RPD				
Date prepared	-	92553-2		20/6/2013 20/6/2013		92553-2	20/6/2013	
Date analysed	-	92553-2		20/6/2013 20/6/2013		92553-2	20/6/2013	
Calcium - Dissolved	mg/L	92553-2		5.3 [N/T]		92553-2	89%	
Potassium - Dissolved	mg/L	92553-2		2.5 [N/T]		92553-2	117%	
Sodium - Dissolved	mg/L	92553-2		130 [N/T]		92553-2	#	
Magnesium - Dissolved	mg/L	92553-2		7.9 [N/T]		92553-2	84%	
Hydroxide Alkalinity (OH ⁻) as CaCO ₃	mg/L	92553-2		<5 <5		[NR]	[NR]	
Bicarbonate Alkalinity as CaCO ₃	mg/L	92553-2		110 110 RPD: 0		[NR]	[NR]	
Carbonate Alkalinity as CaCO ₃	mg/L	92553-2		<5 <5		[NR]	[NR]	
Total Alkalinity as CaCO ₃	mg/L	92553-2		110 110 RPD: 0		[NR]	[NR]	
Sulphate, SO ₄	mg/L	92553-2		100 [N/T]		92553-2	105%	
Chloride, Cl	mg/L	92553-2		110 [N/T]		92553-2	90%	

Report Comments:

Total Recoverable Hydrocarbons in water:(BTEX) PQL has been raised due to the sample matrix requiring dilution (sediment)

ION_BALANCE: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Ion misbalance for samples 3 and 5 due to other ions not measured in Ion balance.

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.



CHAIN OF CUSTODY FORM

SMEC OFFICE: <u>North Sydney</u>		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT	
PROJECT: <u>NBH</u>		☐ Non Standard TAT (List due date):	
PROJECT NUMBER: <u>30011256-014</u>		LAB QUOTE NO.: <u>1454196</u>	
PROJECT MANAGER: <u>Chris Masters</u>		CONTACT PH: <u>0413456085</u>	
SAMPLED BY: <u>penelope.ford@smec.com</u>		COC SEQUENCE NUMBER (Circle)	
DATE SAMPLED: <u>2-3 October 2014</u>		COC: <u>1</u> 2 3 4 5 6 7	
Email Reports to (will default to PM if blank): <u>daniel.sanders@smec.com</u>		OF: <u>1</u> 2 3 4 5 6 7	
Email Invoice to (will default to PM if blank):		RECEIVED BY: <u>Pray</u>	
Special Laboratory Instructions:		DATE/TIME: <u>3/10/14</u>	
LAB: <u>EnviroLab</u>		RECEIVED BY:	
ATTENTION: <u>David Springer</u>		DATE/TIME:	
DISPATCH TO (ADDRESS & PHONE NO.):		RELINQUISHED BY:	
<u>12 Ashley St</u>		DATE/TIME:	
<u>Chatswood</u>			

SAMPLE DETAILS			ANALYSIS REQUIRED				ENVIROLAB		EnviroLab Services	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Combo 6	Combo 8g	Combo 3	Job No:	12 Asbestos ANALYSTS
1	TP03A/0-0.1	2/10/14	5	250ml + 10cl 2ip	2	✓	✓	✓	117190	Chatswood NSW 2067
2	TP03A/1.0								Date Received: 3.10.2014	Ph: (02) 9910 6200
3	TP11/0-0.1								Time Received: 16.30	
4	TP11A/1.0								Received by: <u>Pray</u>	
5	TP13/0-0.1								Temp: <u>Cool Ambient</u>	
6	TP13A/0-0.1								Cooling: <u>Test in pack</u>	
7	TP14/0-0.1								Security: <u>Intact</u> Broken/None	
8	TP15 / 0 - 0.1									
9	TP15A/0.1-0.2									
10	TP16/0-0.1	3/10/14				✓	✓	✓		
11	TP21/0-0.1	3/10/14				✓	✓	✓		
TOTAL										

* note: please test asbestos from small ziplock bag.



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT		LAB: EnviroLab	
PROJECT: NBH		☐ Non Standard TAT (List due date):		ATTENTION: David Springer	
PROJECT NUMBER: 30011256-014		LAB QUOTE NO.: 1454196		DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashley St Chatswood	
PROJECT MANAGER: Chris Masters		CONTACT PH:			
SAMPLED BY: penelope.ford@smec.com					
DATE SAMPLED:		RELINQUISHED BY: Ray		RECEIVED BY:	
Email Reports to (will default to PM if blank): daniel.sanders@smec.com		DATE/TIME: 3/10/14		DATE/TIME: 16.30	
Email Invoice to (will default to PM if blank):					
Special Laboratory Instructions:					

SAMPLE DETAILS			ANALYSIS REQUIRED					COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Cont 6	Cont 8g	EIL*	
12	TP22/0-0.1	2/10/14	S	250ml + 10cl	2	✓	✓	✓	* EIL - Clay content, CEC, Fe, SoilOC, PH
13	TP23/0-0.1								
14	TP25A/0-0.1								
15	TP25A/1.0								
16	TP26/0-0.1						✓		
17	TP27/0-0.1	3/10/14				✓			
18	TP28/0-0.1						✓		
19	TP29/0-0.1					✓			
20	TP29/0.5-0.6								
21	TP32/0-0.1			+ extra ziplock	3		✓	✓	
22	TP33A/0-0.1	2/10/14			2	✓			
TOTAL									



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT		LAB: EnviroLab
PROJECT: 30011256-01/4		☐ Non Standard TAT (List due date):		ATTENTION: David Springer
PROJECT NUMBER:		LAB QUOTE NO.: 1454196		DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashley St
PROJECT MANAGER: Chris Masters		CONTACT PH: 0413456085		chatswood
SAMPLED BY: penelope.ford@smec.com		COC SEQUENCE NUMBER (Circle)		
DATE SAMPLED:		COC: 1 2 3 4 5 6 7		
Email Reports to (will default to PM if blank):		OF: 1 2 3 4 5 6 7		
Email Invoice to (will default to PM if blank):		RECEIVED BY: Play		RECEIVED BY:
Special Laboratory Instructions:		DATE/TIME: 31/01/14 16:30		DATE/TIME:

SAMPLE DETAILS			ANALYSIS REQUIRED				COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS		
117190							
23	TP33A/1.0	2/10/14	5	250ml + 100ml	2	✓	* = CC, CEC, Fe, OC, pH
24	TP34/0-0.1				→	✓	
25	TP35A/1.0			+extra bag	3	✓	
26	TP36/0-0.1				2	✓	
27	TP36/0.5-0.6						
28	TP37/0-0.1	3/10/14				✓	
29	TP38/0-0.1						
30	TP39/0-0.1					✓	
31	TP41A/0.5-0.6	2/10/14				✓	
32	TP43/0-0.1					✓	
33	TP44/0-0.1					✓	
TOTAL							



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney NSW 2060

ph: 02 9925 5555
Fax: 02 9925 5566

Attention: Chris Masters

Sample log in details:

Your reference:	30011256.014
Envirolab Reference:	117190
Date received:	03/10/14
Date results expected to be reported:	13/10/14

Samples received in appropriate condition for analysis:	YES
No. of samples provided	40 soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	15.6
Cooling Method:	Ice
Sampling Date Provided:	YES

Comments:

If there is sufficient sample after testing, samples will be held for the following time frames from date of receipt of samples:
Water samples - 1 month
Soil and other solid samples - 2 months
Samples collected in canisters - 1 week. Canisters will then be cleaned.
All other samples are not retained after analysis
If you require samples to be retained for longer periods then retention fees will apply as per our pricelist.

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

117190

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney
NSW 2060

Attention: Chris Masters

Sample log in details:

Your Reference: **30011256.014**
No. of samples: 40 soils
Date samples received / completed instructions received 03/10/14 / 03/10/14
This report replaces the one dated 13/10/2014 (R00) due to the addition of TOC results.

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: 13/10/14 / 14/10/14
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: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-1 TP03A 0-0.1 02/10/2014 Soil	117190-2 TP03A 1.0 02/10/2014 Soil	117190-4 TP11A 1.0 02/10/2014 Soil	117190-5 TP13 0-0.1 02/10/2014 Soil	117190-6 TP13A 0-0.1 02/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	89	96	92	94

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-7 TP14 0-0.1 02/10/2014 Soil	117190-8 TP15 0-0.1 02/10/2014 Soil	117190-9 TP15A 0.1-0.2 02/10/2014 Soil	117190-10 TP16 0-0.1 03/10/2014 Soil	117190-11 TP21 0-0.1 03/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	89	94	91	89

vTRH(C6-C10)/BTEXN in Soil	UNITS	117190-12	117190-13	117190-14	117190-16	117190-17
Our Reference:	-----	TP22	TP23	TP25A	TP26	TP27
Your Reference	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Depth		02/10/2014	02/10/2014	02/10/2014	02/10/2014	03/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	90	106	96	92

vTRH(C6-C10)/BTEXN in Soil	UNITS	117190-18	117190-19	117190-21	117190-22	117190-23
Our Reference:	-----	TP28	TP29	TP32	TP33A	TP33A
Your Reference	-----	0-0.1	0-0.1	0-0.1	0-0.1	1.0
Depth		03/10/2014	03/10/2014	03/10/2014	02/10/2014	02/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	89	89	85	97

vTRH(C6-C10)/BTEXN in Soil	UNITS	117190-24	117190-25	117190-26	117190-28	117190-29
Our Reference:	-----	TP34	TP35A	TP36	TP37	TP38
Your Reference	-----	0-0.1	1.0	0-0.1	0-0.1	0-0.1
Depth		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	84	86	92	88

vTRH(C6-C10)/BTEXN in Soil	UNITS	117190-30	117190-31	117190-32	117190-33	117190-34
Our Reference:	-----	TP39	TP41A	TP43	TP44	TP45
Your Reference	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0-0.1
Depth		03/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	82	91	96	101	101

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	117190-35	117190-36	117190-38	117190-39	117190-40
Your Reference	-----	TP46	QC1	QC5	TB1	TS1
Depth	-----	1.0	-	-	-	-
Date Sampled		02/10/2014	02/10/2014	03/10/2014	30/09/2014	30/09/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	[NA]
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	[NA]
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	101%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	102%
Ethylbenzene	mg/kg	<1	<1	<1	<1	102%
m+p-xylene	mg/kg	<2	<2	<2	<2	102%
o-Xylene	mg/kg	<1	<1	<1	<1	102%
naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	96	94	83	101	87

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-1 TP03A 0-0.1 02/10/2014 Soil	117190-2 TP03A 1.0 02/10/2014 Soil	117190-4 TP11A 1.0 02/10/2014 Soil	117190-5 TP13 0-0.1 02/10/2014 Soil	117190-6 TP13A 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	08/10/2014	08/10/2014	08/10/2014	08/10/2014	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	210	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	400	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	67	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	67	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	490	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	140	<100
Surrogate o-Terphenyl	%	90	88	90	97	85

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-7 TP14 0-0.1 02/10/2014 Soil	117190-8 TP15 0-0.1 02/10/2014 Soil	117190-9 TP15A 0.1-0.2 02/10/2014 Soil	117190-10 TP16 0-0.1 03/10/2014 Soil	117190-11 TP21 0-0.1 03/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	08/10/2014	09/10/2014	08/10/2014	08/10/2014	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	400	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	130	770	<100	<100	250
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	150	990	<100	<100	270
TRH>C ₃₄ -C ₄₀	mg/kg	<100	520	<100	<100	<100
Surrogate o-Terphenyl	%	91	94	90	86	90

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-12 TP22 0-0.1 02/10/2014 Soil	117190-13 TP23 0-0.1 02/10/2014 Soil	117190-14 TP25A 0-0.1 02/10/2014 Soil	117190-16 TP26 0-0.1 02/10/2014 Soil	117190-17 TP27 0-0.1 03/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	08/10/2014	08/10/2014	08/10/2014	08/10/2014	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	170	100	<100	160	120
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	190	110	<100	200	140
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	91	89	88	87	92

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-18 TP28 0-0.1 03/10/2014 Soil	117190-19 TP29 0-0.1 03/10/2014 Soil	117190-21 TP32 0-0.1 03/10/2014 Soil	117190-22 TP33A 0-0.1 02/10/2014 Soil	117190-23 TP33A 1.0 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	08/10/2014	08/10/2014	08/10/2014	08/10/2014	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	170	110	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	190	130	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	93	89	88	87	86

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-24 TP34 0-0.1 02/10/2014 Soil	117190-25 TP35A 1.0 02/10/2014 Soil	117190-26 TP36 0-0.1 02/10/2014 Soil	117190-28 TP37 0-0.1 03/10/2014 Soil	117190-29 TP38 0-0.1 03/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	08/10/2014	08/10/2014	08/10/2014	08/10/2014	09/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	140
TRHC ₂₉ - C ₃₆	mg/kg	160	<100	120	150	300
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	160	<100	130	160	350
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	130
Surrogate o-Terphenyl	%	93	81	85	85	92

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-30 TP39 0-0.1 03/10/2014 Soil	117190-31 TP41A 0.5-0.6 02/10/2014 Soil	117190-32 TP43 0-0.1 02/10/2014 Soil	117190-33 TP44 0-0.1 02/10/2014 Soil	117190-34 TP45 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	09/10/2014	09/10/2014	09/10/2014	09/10/2014	09/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	110	<100	110
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	86	89	91	87	91

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	117190-35	117190-36	117190-38	117190-39
Your Reference	-----	TP46	QC1	QC5	TB1
Depth	-----	1.0	-	-	-
Date Sampled		02/10/2014	02/10/2014	03/10/2014	30/09/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	09/10/2014	09/10/2014	09/10/2014	09/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100
Surrogate o-Terphenyl	%	84	86	79	90

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-1 TP03A 0-0.1 02/10/2014 Soil	117190-2 TP03A 1.0 02/10/2014 Soil	117190-4 TP11A 1.0 02/10/2014 Soil	117190-5 TP13 0-0.1 02/10/2014 Soil	117190-6 TP13A 0-0.1 02/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	96	99	102	102

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-7 TP14 0-0.1 02/10/2014 Soil	117190-8 TP15 0-0.1 02/10/2014 Soil	117190-9 TP15A 0.1-0.2 02/10/2014 Soil	117190-10 TP16 0-0.1 03/10/2014 Soil	117190-11 TP21 0-0.1 03/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	1.8	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	0.6	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	3.8	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	4.2	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	2.8	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	2.3	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	4.8	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.07	3.3	0.07	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	2.2	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	1.8	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	4.7	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.070	29	0.070	NIL(+)VE	NIL(+)VE
Surrogate p-Terphenyl-d14	%	102	104	108	105	105

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-12 TP22 0-0.1 02/10/2014 Soil	117190-13 TP23 0-0.1 02/10/2014 Soil	117190-14 TP25A 0-0.1 02/10/2014 Soil	117190-16 TP26 0-0.1 02/10/2014 Soil	117190-17 TP27 0-0.1 03/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	111	119	99	104	115

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-18 TP28 0-0.1 03/10/2014 Soil	117190-19 TP29 0-0.1 03/10/2014 Soil	117190-21 TP32 0-0.1 03/10/2014 Soil	117190-22 TP33A 0-0.1 02/10/2014 Soil	117190-23 TP33A 1.0 02/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	0.12	<0.05	0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.05	1.3	NIL (+)VE	0.05	NIL (+)VE
Surrogate p-Terphenyl-d14	%	122	112	110	105	105

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-24 TP34 0-0.1 02/10/2014 Soil	117190-25 TP35A 1.0 02/10/2014 Soil	117190-26 TP36 0-0.1 02/10/2014 Soil	117190-28 TP37 0-0.1 03/10/2014 Soil	117190-29 TP38 0-0.1 03/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05	<0.05	<0.05	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.05	NIL (+)VE	NIL (+)VE	NIL (+)VE	0.31
Surrogate p-Terphenyl-d14	%	118	103	103	104	113

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-30 TP39 0-0.1 03/10/2014 Soil	117190-31 TP41A 0.5-0.6 02/10/2014 Soil	117190-32 TP43 0-0.1 02/10/2014 Soil	117190-33 TP44 0-0.1 02/10/2014 Soil	117190-34 TP45 0-0.1 02/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	106	108	110	106	108

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-35 TP46 1.0 02/10/2014 Soil	117190-36 QC1 - 02/10/2014 Soil	117190-38 QC5 - 03/10/2014 Soil
Date extracted	-	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014
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	<0.1	<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	<0.1	<0.1	<0.1
Benzo(b,j+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 Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	108	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117190-1	117190-2	117190-5	117190-6	117190-7
Your Reference	-----	TP03A	TP03A	TP13	TP13A	TP14
Depth	-----	0-0.1	1.0	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	91	109	83	88

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117190-8	117190-9	117190-10	117190-11	117190-12
Your Reference	-----	TP15	TP15A	TP16	TP21	TP22
Depth	-----	0-0.1	0.1-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	90	85	95	92

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117190-13	117190-14	117190-16	117190-17	117190-18
Your Reference	-----	TP23	TP25A	TP26	TP27	TP28
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	87	88	97	95

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117190-19	117190-21	117190-22	117190-23	117190-24
Your Reference	-----	TP29	TP32	TP33A	TP33A	TP34
Depth	-----	0-0.1	0-0.1	0-0.1	1.0	0-0.1
Date Sampled		03/10/2014	03/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	85	82	85	95

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117190-25	117190-26	117190-28	117190-29	117190-30
Your Reference	-----	TP35A	TP36	TP37	TP38	TP39
Depth	-----	1.0	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	86	81	101	79

Organochlorine Pesticides in soil					
Our Reference:	UNITS	117190-31	117190-32	117190-33	117190-34
Your Reference	-----	TP41A	TP43	TP44	TP45
Depth	-----	0.5-0.6	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	88	93	84	91

Organophosphorus Pesticides						
Our Reference:	UNITS	117190-1	117190-2	117190-5	117190-6	117190-7
Your Reference	-----	TP03A	TP03A	TP13	TP13A	TP14
Depth	-----	0-0.1	1.0	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	91	109	83	88

Organophosphorus Pesticides						
Our Reference:	UNITS	117190-8	117190-9	117190-10	117190-11	117190-12
Your Reference	-----	TP15	TP15A	TP16	TP21	TP22
Depth	-----	0-0.1	0.1-0.2	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	90	85	95	92

Organophosphorus Pesticides						
Our Reference:	UNITS	117190-13	117190-14	117190-16	117190-17	117190-18
Your Reference	-----	TP23	TP25A	TP26	TP27	TP28
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	87	88	97	95

Organophosphorus Pesticides						
Our Reference:	UNITS	117190-19	117190-21	117190-22	117190-23	117190-24
Your Reference	-----	TP29	TP32	TP33A	TP33A	TP34
Depth	-----	0-0.1	0-0.1	0-0.1	1.0	0-0.1
Date Sampled		03/10/2014	03/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	86	85	82	85	95

Organophosphorus Pesticides						
Our Reference:	UNITS	117190-25	117190-26	117190-28	117190-29	117190-30
Your Reference	-----	TP35A	TP36	TP37	TP38	TP39
Depth	-----	1.0	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	78	86	81	101	79

Organophosphorus Pesticides					
Our Reference:	UNITS	117190-31	117190-32	117190-33	117190-34
Your Reference	-----	TP41A	TP43	TP44	TP45
Depth	-----	0.5-0.6	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	88	93	84	91

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-1 TP03A 0-0.1 02/10/2014 Soil	117190-2 TP03A 1.0 02/10/2014 Soil	117190-5 TP13 0-0.1 02/10/2014 Soil	117190-6 TP13A 0-0.1 02/10/2014 Soil	117190-7 TP14 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	91	109	83	88

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-8 TP15 0-0.1 02/10/2014 Soil	117190-9 TP15A 0.1-0.2 02/10/2014 Soil	117190-10 TP16 0-0.1 03/10/2014 Soil	117190-11 TP21 0-0.1 03/10/2014 Soil	117190-12 TP22 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.5	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	90	90	85	95	92

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-13 TP23 0-0.1 02/10/2014 Soil	117190-14 TP25A 0-0.1 02/10/2014 Soil	117190-16 TP26 0-0.1 02/10/2014 Soil	117190-17 TP27 0-0.1 03/10/2014 Soil	117190-18 TP28 0-0.1 03/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	87	88	97	95

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-19 TP29 0-0.1 03/10/2014 Soil	117190-21 TP32 0-0.1 03/10/2014 Soil	117190-22 TP33A 0-0.1 02/10/2014 Soil	117190-23 TP33A 1.0 02/10/2014 Soil	117190-24 TP34 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	86	85	82	85	95

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-25 TP35A 1.0 02/10/2014 Soil	117190-26 TP36 0-0.1 02/10/2014 Soil	117190-28 TP37 0-0.1 03/10/2014 Soil	117190-29 TP38 0-0.1 03/10/2014 Soil	117190-30 TP39 0-0.1 03/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	78	86	81	101	79

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117190-31 TP41A 0.5-0.6 02/10/2014 Soil	117190-32 TP43 0-0.1 02/10/2014 Soil	117190-33 TP44 0-0.1 02/10/2014 Soil	117190-34 TP45 0-0.1 02/10/2014 Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	88	93	84	91

Total Phenolics in Soil						
Our Reference:	UNITS	117190-2	117190-5	117190-7	117190-8	117190-9
Your Reference	-----	TP03A	TP13	TP14	TP15	TP15A
Depth	-----	1.0	0-0.1	0-0.1	0-0.1	0.1-0.2
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Total Phenolics in Soil						
Our Reference:	UNITS	117190-13	117190-16	117190-18	117190-21	117190-25
Your Reference	-----	TP23	TP26	TP28	TP32	TP35A
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	1.0
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	07/10/2014	07/10/2014	07/10/2014	07/10/2014	07/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Acid Extractable metals in soil						
Our Reference:	UNITS	117190-1	117190-2	117190-4	117190-5	117190-6
Your Reference	-----	TP03A	TP03A	TP11A	TP13	TP13A
Depth	-----	0-0.1	1.0	1.0	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	<4	<4	9	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	8	21	8	14
Copper	mg/kg	5	5	21	170	13
Lead	mg/kg	13	4	9	55	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	<1	<1	2	1
Zinc	mg/kg	5	<1	<1	26	6
Iron	mg/kg	16,000	4,600	1,400	2,900	3,400

Acid Extractable metals in soil						
Our Reference:	UNITS	117190-7	117190-8	117190-9	117190-10	117190-11
Your Reference	-----	TP14	TP15	TP15A	TP16	TP21
Depth	-----	0-0.1	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	19	9	7	10
Copper	mg/kg	9	26	7	4	7
Lead	mg/kg	54	210	66	10	39
Mercury	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Nickel	mg/kg	2	3	5	<1	3
Zinc	mg/kg	81	150	52	2	17
Iron	mg/kg	3,900	4,700	6,500	9,500	6,900

Acid Extractable metals in soil						
Our Reference:	UNITS	117190-12	117190-13	117190-14	117190-16	117190-17
Your Reference	-----	TP22	TP23	TP25A	TP26	TP27
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	<4	<4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	9	11	11	12
Copper	mg/kg	17	10	19	10	440
Lead	mg/kg	52	30	17	37	84
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	2	<1	2	4
Zinc	mg/kg	44	18	2	83	54
Iron	mg/kg	6,700	2,800	1,100	3,300	5,100

Acid Extractable metals in soil						
Our Reference:	UNITS	117190-18	117190-19	117190-21	117190-22	117190-23
Your Reference	-----	TP28	TP29	TP32	TP33A	TP33A
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	1.0
Date Sampled		03/10/2014	03/10/2014	03/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	4	5	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	17	12	10	13
Copper	mg/kg	13	6	9	10	7
Lead	mg/kg	59	66	29	19	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	3	2	2	<1
Zinc	mg/kg	28	21	15	9	<1
Iron	mg/kg	6,100	19,000	4,300	3,400	3,000

Acid Extractable metals in soil	UNITS	117190-24	117190-25	117190-26	117190-28	117190-29
Our Reference:	-----	TP34	TP35A	TP36	TP37	TP38
Your Reference	-----	0-0.1	1.0	0-0.1	0-0.1	0-0.1
Depth		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	<4	6	<4	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	15	8	10	10
Copper	mg/kg	16	3	8	9	14
Lead	mg/kg	31	14	61	31	71
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	<1	2	2	3
Zinc	mg/kg	46	<1	14	11	27
Iron	mg/kg	5,900	2,900	3,300	4,100	4,600

Acid Extractable metals in soil	UNITS	117190-30	117190-31	117190-32	117190-33	117190-34
Our Reference:	-----	TP39	TP41A	TP43	TP44	TP45
Your Reference	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0-0.1
Depth		03/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date digested	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	4	26	6	<4	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	15	17	10	12
Copper	mg/kg	6	2	7	4	4
Lead	mg/kg	21	19	76	15	31
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	1	4	2	2
Zinc	mg/kg	10	2	24	7	11
Iron	mg/kg	6,600	6,000	20,000	5,900	13,000

Acid Extractable metals in soil				
Our Reference:	UNITS	117190-35	117190-36	117190-38
Your Reference	-----	TP46	QC1	QC5
Depth	-----	1.0	-	-
Date Sampled		02/10/2014	02/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil
Date digested	-	8/10/2014	8/10/2014	8/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014
Arsenic	mg/kg	11	16	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	12	24	11
Copper	mg/kg	3	3	8
Lead	mg/kg	27	14	24
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	2
Zinc	mg/kg	<1	<1	13
Iron	mg/kg	42,000	5,700	4,100

Moisture						
Our Reference:	UNITS	117190-1	117190-2	117190-4	117190-5	117190-6
Your Reference	-----	TP03A	TP03A	TP11A	TP13	TP13A
Depth	-----	0-0.1	1.0	1.0	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	20	12	15	20	17

Moisture						
Our Reference:	UNITS	117190-7	117190-8	117190-9	117190-10	117190-11
Your Reference	-----	TP14	TP15	TP15A	TP16	TP21
Depth	-----	0-0.1	0-0.1	0.1-0.2	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	31	33	15	17	30

Moisture						
Our Reference:	UNITS	117190-12	117190-13	117190-14	117190-16	117190-17
Your Reference	-----	TP22	TP23	TP25A	TP26	TP27
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	35	32	4.2	32	34

Moisture						
Our Reference:	UNITS	117190-18	117190-19	117190-21	117190-22	117190-23
Your Reference	-----	TP28	TP29	TP32	TP33A	TP33A
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	1.0
Date Sampled		03/10/2014	03/10/2014	03/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	32	33	30	25	18

Moisture						
Our Reference:	UNITS	117190-24	117190-25	117190-26	117190-28	117190-29
Your Reference	-----	TP34	TP35A	TP36	TP37	TP38
Depth	-----	0-0.1	1.0	0-0.1	0-0.1	0-0.1
Date Sampled		02/10/2014	02/10/2014	02/10/2014	03/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	13	16	28	20	30

Moisture						
Our Reference:	UNITS	117190-30	117190-31	117190-32	117190-33	117190-34
Your Reference	-----	TP39	TP41A	TP43	TP44	TP45
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0-0.1
Date Sampled		03/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014	8/10/2014	8/10/2014
Moisture	%	10	20	10	7.8	10

Moisture				
Our Reference:	UNITS	117190-35	117190-36	117190-38
Your Reference	-----	TP46	QC1	QC5
Depth	-----	1.0	-	-
Date Sampled		02/10/2014	02/10/2014	03/10/2014
Type of sample		Soil	Soil	Soil
Date prepared	-	7/10/2014	7/10/2014	7/10/2014
Date analysed	-	8/10/2014	8/10/2014	8/10/2014
Moisture	%	16	16	33

Asbestos ID - soils						
Our Reference:	UNITS	117190-2	117190-5	117190-7	117190-8	117190-9
Your Reference	-----	TP03A	TP13	TP14	TP15	TP15A
Depth	-----	1.0	0-0.1	0-0.1	0-0.1	0.1-0.2
Date Sampled		02/10/2014	02/10/2014	02/10/2014	02/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Sample mass tested	g	Approx 40g	Approx 35g	Approx 35g	Approx 30g	Approx 45g
Sample Description	-	Beige fine grain soil & rocks	Brown coarse grain soil	Brown coarse grain soil	Brown coarse grain soil	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	117190-13	117190-16	117190-18	117190-21	117190-25
Your Reference	-----	TP23	TP26	TP28	TP32	TP35A
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	1.0
Date Sampled		02/10/2014	02/10/2014	03/10/2014	03/10/2014	02/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Sample mass tested	g	Approx 30g	Approx 35g	Approx 35g	Approx 35g	Approx 35g
Sample Description	-	Brown fine grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Off-white fine grain soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference:	UNITS	117190-28	117190-30
Your Reference	-----	TP37	TP39
Depth	-----	0-0.1	0-0.1
Date Sampled		03/10/2014	03/10/2014
Type of sample		Soil	Soil
Date analysed	-	13/10/2014	13/10/2014
Sample mass tested	g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected

Miscellaneous Inorg - soil			
Our Reference:	UNITS	117190-21	117190-25
Your Reference	-----	TP32	TP35A
Depth	-----	0-0.1	1.0
Date Sampled		03/10/2014	02/10/2014
Type of sample		Soil	Soil
Date prepared	-	07/10/2014	07/10/2014
Date analysed	-	10/10/2014	10/10/2014
pH 1:5 soil:water	pH Units	4.6	4.0
Clay in soils <2um	% (w/w)	30	50
Total Organic Carbon (Walkley Black)	mg/kg	46,000	<1,000

CEC			
Our Reference:	UNITS	117190-21	117190-25
Your Reference	-----	TP32	TP35A
Depth	-----	0-0.1	1.0
Date Sampled		03/10/2014	02/10/2014
Type of sample		Soil	Soil
Date extracted	-	07/10/2014	07/10/2014
Date analysed	-	07/10/2014	07/10/2014
Exchangeable Ca	meq/100g	0.8	<0.1
Exchangeable K	meq/100g	0.4	<0.1
Exchangeable Mg	meq/100g	1.3	0.39
Exchangeable Na	meq/100g	0.17	<0.1
Cation Exchange Capacity	meq/100g	2.6	<1.0

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)-BTEX 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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2um reported.
Inorg-036	Total Organic Carbon - A titrimetric method that measures the oxidisable organic content of soils. Based upon Walkley/Black and 'Rayment and Lyons 2011'.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soil based on Rayment and Lyons 2011.

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	-			07/10/2014	117190-2	7/10/2014 7/10/2014	LCS-9	07/10/2014
Date analysed	-			08/10/2014	117190-2	8/10/2014 8/10/2014	LCS-9	08/10/2014
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	117190-2	<25 <25	LCS-9	116%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	117190-2	<25 <25	LCS-9	116%
Benzene	mg/kg	0.2	Org-016	<0.2	117190-2	<0.2 <0.2	LCS-9	105%
Toluene	mg/kg	0.5	Org-016	<0.5	117190-2	<0.5 <0.5	LCS-9	117%
Ethylbenzene	mg/kg	1	Org-016	<1	117190-2	<1 <1	LCS-9	118%
m+p-xylene	mg/kg	2	Org-016	<2	117190-2	<2 <2	LCS-9	121%
o-Xylene	mg/kg	1	Org-016	<1	117190-2	<1 <1	LCS-9	124%
naphthalene	mg/kg	1	Org-014	<1	117190-2	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	104	117190-2	89 97 RPD: 9	LCS-9	101%
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	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Date analysed	-			08/10/2014	117190-2	08/10/2014 08/10/2014	LCS-9	07/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	117190-2	<50 <50	LCS-9	107%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	117190-2	<100 <100	LCS-9	120%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	117190-2	<100 <100	LCS-9	137%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	117190-2	<50 <50	LCS-9	107%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	117190-2	<100 <100	LCS-9	120%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	117190-2	<100 <100	LCS-9	137%
Surrogate o-Terphenyl	%		Org-003	89	117190-2	88 93 RPD: 6	LCS-9	101%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			7/10/2014	117190-2	7/10/2014 7/10/2014	LCS-9	7/10/2014
Date analysed	-			07/10/2014	117190-2	8/10/2014 8/10/2014	LCS-9	07/10/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	97%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	100%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	103%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	104%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	104%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	LCS-9	92%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	117190-2	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	117190-2	<0.05 <0.05	LCS-9	122%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	104	117190-2	96 103 RPD: 7	LCS-9	107%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Date analysed	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
HCB	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	95%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	90%
Heptachlor	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	98%
delta-BHC	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	101%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	100%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	86%
Dieldrin	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	100%
Endrin	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	96%
pp-DDD	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	92%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	LCS-9	89%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	91	117190-2	91 99 RPD: 8	LCS-9	91%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Date analysed	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Diazinon	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	LCS-9	90%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	LCS-9	84%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	117190-2	<0.1 <0.1	LCS-9	86%
Surrogate TCMX	%		Org-008	91	117190-2	91 99 RPD: 8	LCS-9	89%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Date analysed	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-9	07/10/2014
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	LCS-9	114%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	117190-2	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	91	117190-2	91 99 RPD: 8	LCS-9	84%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			07/10/2014	117190-2	07/10/2014 07/10/2014	LCS-1	07/10/2014
Date analysed	-			10/10/2014	117190-2	10/10/2014 10/10/2014	LCS-1	10/10/2014
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	117190-2	<5 <5	LCS-1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			8/10/2014	117190-2	8/10/2014 8/10/2014	LCS-1	8/10/2014
Date analysed	-			8/10/2014	117190-2	8/10/2014 8/10/2014	LCS-1	8/10/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	117190-2	<4 <4	LCS-1	97%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	117190-2	<0.4 <0.4	LCS-1	99%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	8 7 RPD: 13	LCS-1	100%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	5 5 RPD: 0	LCS-1	100%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	4 4 RPD: 0	LCS-1	99%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	117190-2	<0.1 <0.1	LCS-1	99%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	<1 <1	LCS-1	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	<1 <1	LCS-1	99%
Iron	mg/kg	1	Metals-020 ICP-AES	<1	117190-2	4600 4700 RPD: 2	LCS-1	99%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base II Duplicate II %RPD		
Date prepared	-			07/10/2014	[NT]	[NT]	LCS-1	07/10/2014
Date analysed	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	102%
Clay in soils <2um	% (w/w)		AS1289.3.6	[NT]	[NT]	[NT]	[NR]	[NR]
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	[NT]	[NT]	LCS-1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base II Duplicate II %RPD		
Date extracted	-			[NT]	117190-21	07/10/2014 07/10/2014	LCS-1	07/10/2014
Date analysed	-			[NT]	117190-21	07/10/2014 07/10/2014	LCS-1	07/10/2014
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	117190-21	0.8 0.7 RPD: 13	LCS-1	102%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	117190-21	0.4 0.3 RPD: 29	LCS-1	103%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	117190-21	1.3 1.2 RPD: 8	LCS-1	102%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	117190-21	0.17 0.16 RPD: 6	LCS-1	105%
Cation Exchange Capacity	meq/100 g	1	Metals-009	<1.0	117190-21	2.6 2.4 RPD: 8	[NR]	[NR]
QUALITY CONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD		Spike Sm#	Spike % Recovery	
vTRH(C6-C10)/BTEXN in Soil								
Date extracted	-	117190-12		7/10/2014 7/10/2014		LCS-10	07/10/2014	
Date analysed	-	117190-12		8/10/2014 8/10/2014		LCS-10	08/10/2014	
TRHC ₆ - C ₉	mg/kg	117190-12		<25 <25		LCS-10	118%	
TRHC ₆ - C ₁₀	mg/kg	117190-12		<25 <25		LCS-10	118%	

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzene	mg/kg	117190-12	<0.2 <0.2	LCS-10	105%
Toluene	mg/kg	117190-12	<0.5 <0.5	LCS-10	116%
Ethylbenzene	mg/kg	117190-12	<1 <1	LCS-10	123%
m+p-xylene	mg/kg	117190-12	<2 <2	LCS-10	123%
o-Xylene	mg/kg	117190-12	<1 <1	LCS-10	128%
naphthalene	mg/kg	117190-12	<1 <1	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	117190-12	92 86 RPD: 7	LCS-10	101%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Date analysed	-	117190-12	08/10/2014 08/10/2014	LCS-10	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	117190-12	<50 <50	LCS-10	119%
TRHC ₁₅ - C ₂₈	mg/kg	117190-12	<100 <100	LCS-10	131%
TRHC ₂₉ - C ₃₆	mg/kg	117190-12	170 140 RPD: 19	LCS-10	126%
TRH>C ₁₀ -C ₁₆	mg/kg	117190-12	<50 <50	LCS-10	119%
TRH>C ₁₆ -C ₃₄	mg/kg	117190-12	190 140 RPD: 30	LCS-10	131%
TRH>C ₃₄ -C ₄₀	mg/kg	117190-12	<100 <100	LCS-10	126%
Surrogate o-Terphenyl	%	117190-12	91 89 RPD: 2	LCS-10	105%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-12	7/10/2014 7/10/2014	LCS-10	7/10/2014
Date analysed	-	117190-12	8/10/2014 8/10/2014	LCS-10	07/10/2014
Naphthalene	mg/kg	117190-12	<0.1 <0.1	LCS-10	99%
Acenaphthylene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	117190-12	<0.1 <0.1	LCS-10	101%
Phenanthrene	mg/kg	117190-12	<0.1 <0.1	LCS-10	100%
Anthracene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117190-12	<0.1 <0.1	LCS-10	103%
Pyrene	mg/kg	117190-12	<0.1 <0.1	LCS-10	105%
Benzo(a)anthracene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	117190-12	<0.1 <0.1	LCS-10	91%
Benzo(b,j+k)fluoranthene	mg/kg	117190-12	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117190-12	<0.05 <0.05	LCS-10	119%
Indeno(1,2,3-c,d)pyrene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117190-12	111 103 RPD: 7	LCS-10	109%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Date analysed	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
HCB	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117190-12	<0.1 <0.1	LCS-10	87%
gamma-BHC	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	117190-12	<0.1 <0.1	LCS-10	80%
Heptachlor	mg/kg	117190-12	<0.1 <0.1	LCS-10	78%
delta-BHC	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	117190-12	<0.1 <0.1	LCS-10	93%
Heptachlor Epoxide	mg/kg	117190-12	<0.1 <0.1	LCS-10	91%
gamma-Chlordane	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	117190-12	<0.1 <0.1	LCS-10	78%
Dieldrin	mg/kg	117190-12	<0.1 <0.1	LCS-10	92%
Endrin	mg/kg	117190-12	<0.1 <0.1	LCS-10	81%
pp-DDD	mg/kg	117190-12	<0.1 <0.1	LCS-10	82%
Endosulfan II	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117190-12	<0.1 <0.1	LCS-10	73%
Methoxychlor	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	117190-12	92 92 RPD: 0	LCS-10	84%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Date analysed	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Diazinon	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	117190-12	<0.1 <0.1	LCS-10	89%
Fenitrothion	mg/kg	117190-12	<0.1 <0.1	LCS-10	84%
Bromophos-ethyl	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	117190-12	<0.1 <0.1	LCS-10	88%
Surrogate TCMX	%	117190-12	92 92 RPD: 0	LCS-10	84%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Date analysed	-	117190-12	07/10/2014 07/10/2014	LCS-10	07/10/2014
Arochlor 1016	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117190-12	<0.1 <0.1	LCS-10	100%
Arochlor 1260	mg/kg	117190-12	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	117190-12	92 92 RPD: 0	LCS-10	80%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117190-12	8/10/2014 8/10/2014	LCS-2	8/10/2014
Date analysed	-	117190-12	8/10/2014 8/10/2014	LCS-2	8/10/2014
Arsenic	mg/kg	117190-12	<4 <4	LCS-2	91%
Cadmium	mg/kg	117190-12	<0.4 <0.4	LCS-2	94%
Chromium	mg/kg	117190-12	13 13 RPD: 0	LCS-2	93%
Copper	mg/kg	117190-12	17 16 RPD: 6	LCS-2	94%
Lead	mg/kg	117190-12	52 49 RPD: 6	LCS-2	92%
Mercury	mg/kg	117190-12	<0.1 <0.1	LCS-2	99%
Nickel	mg/kg	117190-12	5 5 RPD: 0	LCS-2	94%
Zinc	mg/kg	117190-12	44 42 RPD: 5	LCS-2	93%
Iron	mg/kg	117190-12	6700 6500 RPD: 3	LCS-2	94%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	7/10/2014 7/10/2014	117190-5	07/10/2014
Date analysed	-	117190-22	8/10/2014 8/10/2014	117190-5	08/10/2014
TRHC ₆ - C ₉	mg/kg	117190-22	<25 <25	117190-5	99%
TRHC ₆ - C ₁₀	mg/kg	117190-22	<25 <25	117190-5	99%
Benzene	mg/kg	117190-22	<0.2 <0.2	117190-5	88%
Toluene	mg/kg	117190-22	<0.5 <0.5	117190-5	99%
Ethylbenzene	mg/kg	117190-22	<1 <1	117190-5	102%
m+p-xylene	mg/kg	117190-22	<2 <2	117190-5	104%
o-Xylene	mg/kg	117190-22	<1 <1	117190-5	108%
naphthalene	mg/kg	117190-22	<1 <1	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	117190-22	85 90 RPD: 6	117190-5	88%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Date analysed	-	117190-22	08/10/2014 08/10/2014	117190-5	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	117190-22	<50 <50	117190-5	127%
TRHC ₁₅ - C ₂₈	mg/kg	117190-22	<100 <100	117190-5	140%
TRHC ₂₉ - C ₃₆	mg/kg	117190-22	<100 <100	117190-5	#
TRH>C ₁₀ -C ₁₆	mg/kg	117190-22	<50 <50	117190-5	127%
TRH>C ₁₆ -C ₃₄	mg/kg	117190-22	<100 <100	117190-5	140%
TRH>C ₃₄ -C ₄₀	mg/kg	117190-22	<100 <100	117190-5	#
Surrogate o-Terphenyl	%	117190-22	87 88 RPD: 1	117190-5	110%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	7/10/2014 7/10/2014	117190-5	7/10/2014
Date analysed	-	117190-22	8/10/2014 8/10/2014	117190-5	8/10/2014
Naphthalene	mg/kg	117190-22	<0.1 <0.1	117190-5	97%
Acenaphthylene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	117190-22	<0.1 <0.1	117190-5	89%
Phenanthrene	mg/kg	117190-22	<0.1 <0.1	117190-5	97%
Anthracene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117190-22	<0.1 <0.1	117190-5	98%
Pyrene	mg/kg	117190-22	<0.1 <0.1	117190-5	99%
Benzo(a)anthracene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	117190-22	<0.1 <0.1	117190-5	86%
Benzo(b,j+k)fluoranthene	mg/kg	117190-22	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117190-22	0.05 <0.05	117190-5	104%
Indeno(1,2,3-c,d)pyrene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117190-22	105 109 RPD: 4	117190-5	103%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Date analysed	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
HCB	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117190-22	<0.1 <0.1	117190-5	98%
gamma-BHC	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	117190-22	<0.1 <0.1	117190-5	93%
Heptachlor	mg/kg	117190-22	<0.1 <0.1	117190-5	105%
delta-BHC	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	117190-22	<0.1 <0.1	117190-5	106%
Heptachlor Epoxide	mg/kg	117190-22	<0.1 <0.1	117190-5	103%
gamma-Chlordane	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	117190-22	<0.1 <0.1	117190-5	86%
Dieldrin	mg/kg	117190-22	<0.1 <0.1	117190-5	102%
Endrin	mg/kg	117190-22	<0.1 <0.1	117190-5	103%
pp-DDD	mg/kg	117190-22	<0.1 <0.1	117190-5	93%
Endosulfan II	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117190-22	<0.1 <0.1	117190-5	108%
Methoxychlor	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	117190-22	82 87 RPD: 6	117190-5	100%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Date analysed	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Diazinon	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	117190-22	<0.1 <0.1	117190-5	96%
Fenitrothion	mg/kg	117190-22	<0.1 <0.1	117190-5	93%
Bromophos-ethyl	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	117190-22	<0.1 <0.1	117190-5	96%
Surrogate TCMX	%	117190-22	82 87 RPD: 6	117190-5	108%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Date analysed	-	117190-22	07/10/2014 07/10/2014	117190-5	07/10/2014
Arochlor 1016	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117190-22	<0.1 <0.1	117190-5	115%
Arochlor 1260	mg/kg	117190-22	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	117190-22	82 87 RPD: 6	117190-5	102%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117190-22	8/10/2014 8/10/2014	117190-5	8/10/2014
Date analysed	-	117190-22	8/10/2014 8/10/2014	117190-5	8/10/2014
Arsenic	mg/kg	117190-22	<4 <4	117190-5	99%
Cadmium	mg/kg	117190-22	<0.4 <0.4	117190-5	103%
Chromium	mg/kg	117190-22	10 10 RPD: 0	117190-5	105%
Copper	mg/kg	117190-22	10 13 RPD: 26	117190-5	#
Lead	mg/kg	117190-22	19 25 RPD: 27	117190-5	96%
Mercury	mg/kg	117190-22	<0.1 <0.1	117190-5	92%
Nickel	mg/kg	117190-22	2 2 RPD: 0	117190-5	104%
Zinc	mg/kg	117190-22	9 12 RPD: 29	117190-5	102%
Iron	mg/kg	117190-22	3400 3400 RPD: 0	117190-5	##

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	7/10/2014 7/10/2014	117190-23	07/10/2014
Date analysed	-	117190-32	8/10/2014 8/10/2014	117190-23	08/10/2014
TRHC ₆ - C ₉	mg/kg	117190-32	<25 <25	117190-23	105%
TRHC ₆ - C ₁₀	mg/kg	117190-32	<25 <25	117190-23	105%
Benzene	mg/kg	117190-32	<0.2 <0.2	117190-23	94%
Toluene	mg/kg	117190-32	<0.5 <0.5	117190-23	105%
Ethylbenzene	mg/kg	117190-32	<1 <1	117190-23	107%
m+p-xylene	mg/kg	117190-32	<2 <2	117190-23	110%
o-Xylene	mg/kg	117190-32	<1 <1	117190-23	114%
naphthalene	mg/kg	117190-32	<1 <1	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	117190-32	96 105 RPD: 9	117190-23	89%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Date analysed	-	117190-32	09/10/2014 09/10/2014	117190-23	08/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	117190-32	<50 <50	117190-23	107%
TRHC ₁₅ - C ₂₈	mg/kg	117190-32	<100 <100	117190-23	110%
TRHC ₂₉ - C ₃₆	mg/kg	117190-32	100 130 RPD: 26	117190-23	120%
TRH>C ₁₀ -C ₁₆	mg/kg	117190-32	<50 <50	117190-23	107%
TRH>C ₁₆ -C ₃₄	mg/kg	117190-32	110 140 RPD: 24	117190-23	110%
TRH>C ₃₄ -C ₄₀	mg/kg	117190-32	<100 <100	117190-23	120%
Surrogate o-Terphenyl	%	117190-32	91 86 RPD: 6	117190-23	105%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	7/10/2014 7/10/2014	117190-23	7/10/2014
Date analysed	-	117190-32	8/10/2014 8/10/2014	117190-23	8/10/2014
Naphthalene	mg/kg	117190-32	<0.1 <0.1	117190-23	96%
Acenaphthylene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	117190-32	<0.1 <0.1	117190-23	98%
Phenanthrene	mg/kg	117190-32	<0.1 <0.1	117190-23	99%
Anthracene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117190-32	<0.1 <0.1	117190-23	102%
Pyrene	mg/kg	117190-32	<0.1 <0.1	117190-23	104%
Benzo(a)anthracene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	117190-32	<0.1 <0.1	117190-23	89%
Benzo(b,j+k)fluoranthene	mg/kg	117190-32	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117190-32	<0.05 <0.05	117190-23	114%
Indeno(1,2,3-c,d)pyrene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117190-32	110 102 RPD: 8	117190-23	110%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Date analysed	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
HCB	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117190-32	<0.1 <0.1	117190-23	89%
gamma-BHC	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	117190-32	<0.1 <0.1	117190-23	81%
Heptachlor	mg/kg	117190-32	<0.1 <0.1	117190-23	76%
delta-BHC	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	117190-32	<0.1 <0.1	117190-23	95%
Heptachlor Epoxide	mg/kg	117190-32	<0.1 <0.1	117190-23	93%
gamma-Chlordane	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	117190-32	<0.1 <0.1	117190-23	80%
Dieldrin	mg/kg	117190-32	<0.1 <0.1	117190-23	94%
Endrin	mg/kg	117190-32	<0.1 <0.1	117190-23	76%
pp-DDD	mg/kg	117190-32	<0.1 <0.1	117190-23	80%
Endosulfan II	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117190-32	<0.1 <0.1	117190-23	78%
Methoxychlor	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	117190-32	93 90 RPD: 3	117190-23	85%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Date analysed	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Diazinon	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	117190-32	<0.1 <0.1	117190-23	89%
Fenitrothion	mg/kg	117190-32	<0.1 <0.1	117190-23	80%
Bromophos-ethyl	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	117190-32	<0.1 <0.1	117190-23	89%
Surrogate TCMX	%	117190-32	93 90 RPD: 3	117190-23	86%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Date analysed	-	117190-32	07/10/2014 07/10/2014	117190-23	07/10/2014
Arochlor 1016	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117190-32	<0.1 <0.1	117190-23	105%
Arochlor 1260	mg/kg	117190-32	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	117190-32	93 90 RPD: 3	117190-23	82%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117190-32	8/10/2014 8/10/2014	117190-23	8/10/2014
Date analysed	-	117190-32	8/10/2014 8/10/2014	117190-23	8/10/2014
Arsenic	mg/kg	117190-32	6 <4	117190-23	74%
Cadmium	mg/kg	117190-32	<0.4 <0.4	117190-23	88%
Chromium	mg/kg	117190-32	17 14 RPD: 19	117190-23	82%
Copper	mg/kg	117190-32	7 8 RPD: 13	117190-23	87%
Lead	mg/kg	117190-32	76 82 RPD: 8	117190-23	84%
Mercury	mg/kg	117190-32	<0.1 <0.1	117190-23	102%
Nickel	mg/kg	117190-32	4 3 RPD: 29	117190-23	87%
Zinc	mg/kg	117190-32	24 27 RPD: 12	117190-23	88%
Iron	mg/kg	117190-32	20000 15000 RPD: 29	117190-23	##

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	LCS-3	8/10/2014
Date analysed	-	[NT]	[NT]	LCS-3	8/10/2014
Arsenic	mg/kg	[NT]	[NT]	LCS-3	92%
Cadmium	mg/kg	[NT]	[NT]	LCS-3	93%
Chromium	mg/kg	[NT]	[NT]	LCS-3	93%
Copper	mg/kg	[NT]	[NT]	LCS-3	94%
Lead	mg/kg	[NT]	[NT]	LCS-3	92%
Mercury	mg/kg	[NT]	[NT]	LCS-3	102%
Nickel	mg/kg	[NT]	[NT]	LCS-3	93%
Zinc	mg/kg	[NT]	[NT]	LCS-3	93%
Iron	mg/kg	[NT]	[NT]	LCS-3	95%

Report Comments:

METALS_S: # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

METALS_S: ## Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Total Recoverable Hydrocarbons in soil (Semi-Vol):

Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

PCB's in soil:PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Asbestos ID was analysed by Approved Identifier: Paul Ching

Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test

NA: Test not required

<: Less than

PQL: Practical Quantitation Limit

RPD: Relative Percent Difference

>: Greater than

NT: Not tested

NA: Test not required

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.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☐ Standard - 5 day TAT		LAB: Enviro lab	
PROJECT: NBH		☐ Non Standard TAT (List due date):		ATTENTION: David Springer	
PROJECT NUMBER: 30011256.014		LAB QUOTE NO.: 1454196		DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashley Street Chatswood	
PROJECT MANAGER: Chris Masters		CONTACT PH: 0413456085			
SAMPLED BY: penelope.ford@smec.com					
DATE SAMPLED: 9 October 2014		RECEIVED BY: Sophie		RECEIVED BY: DATE/TIME:	
Email Reports to (will default to PM if blank): daniel.sanders@smec.com		DATE/TIME: 9/10/14 14:00		DATE/TIME:	
Email Invoice to (will default to PM if blank):					
Special Laboratory Instructions:					

SAMPLE DETAILS				ANALYSIS REQUIRED				COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Combo 6	Combo 8g	Combo 6g	
1	TP07/0-0.1	9.10.14	S	2.0 150ml jar 110cl	2	✓	✓	✓	* extra 2.0 10cl bag with ACM
2	TP07/0.5-0.6								
3	TP08/0-0.1								
4	TP08/0.5-0.6								
5	TP17/0-0.1								
6	TP17/0.5-0.6								
7	TP18/0-0.1								
8	TP18/0.5-0.6								
9	TP19/0-0.1								
10	TP19/0.5-0.6								
11	TP20/0-0.1								
TOTAL						✓	✓	✓	

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney
PROJECT: NBH
PROJECT NUMBER: 30011256.014
PROJECT MANAGER: Chris Masters
SAMPLED BY: penslope.ford@smec.com
DATE SAMPLED: 9.10.14
Email Reports to (will default to PM if blank): daniel.sams@smec.com
Email Invoice to (will default to PM if blank):
Special Laboratory Instructions:

TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT
☐ Non Standard TAT (List due date):

LAB: EnviroLab
ATTENTION: David Spranger
DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashley St Chatswood

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

RECEIVED BY: Sofy
DATE/TIME: 9/10/14 14:00

RELINQUISHED BY: penslope.ford
DATE/TIME: 9.10.14

RECEIVED BY:
DATE/TIME:

SAMPLE DETAILS				ANALYSIS REQUIRED				COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Combos 6	Combos 8	
12	TP20/0.5-0.6	9.10.14	5	soil jar lock + zip	2	✓	✓	✓ EIL = CC, CEC, Fe, OC pH
13	TP24/0-0.1					✓		
14	TP25/0-0.1					✓		
15	TP29A/0.2-0.3					✓		
16	TP30/0-0.1					✓		
17	TP30/0.5-0.6					✓		
18	TP42/0-0.1					✓		
19	TP48A/0.5-0.6					✓		
20	TP48A/1.7					✓		
21	QC7							
22	TP7/0-0.1 SK			material				
TOTAL								✓

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

* See front page sample #1



Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney NSW 2060

ph: 02 9925 5555

Fax: 02 9925 5566

Attention: Penelope Ford

Sample log in details:

Your reference:	30011256.014
Envirolab Reference:	117389
Date received:	09/10/2014
Date results expected to be reported:	16/10/14

Samples received in appropriate condition for analysis:	YES
No. of samples provided	21 Soils 1 Material
Turnaround time requested:	Standard
Temperature on receipt (°C)	15.8
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

If there is sufficient sample after testing, samples will be held for the following time frames from date of receipt of samples:

Water samples - 1 month

Soil and other solid samples - 2 months

Samples collected in canisters - 1 week. Canisters will then be cleaned.

All other samples are not retained after analysis

If you require samples to be retained for longer periods then retention fees will apply as per our pricelist.

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

117389

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney
NSW 2060

Attention: Penelope Ford

Sample log in details:

Your Reference:	30011256.014
No. of samples:	21 Soils 1 Material
Date samples received / completed instructions received	09/10/2014 / 09/10/2014

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:	16/10/14 / 16/10/14
Date of Preliminary Report:	Not Issued

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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	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Our Reference:	-----	TP07	TP08	TP17	TP18	TP19
Your Reference	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Depth		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	96	94	95	94

vTRH(C6-C10)/BTEXN in Soil	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Our Reference:	-----	TP20	TP20	TP24	TP25	TP29A
Your Reference	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Depth		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	100	90	99	101

vTRH(C6-C10)/BTEXN in Soil					
Our Reference:	UNITS	117389-16	117389-18	117389-19	117389-21
Your Reference	-----	TP30	TP42	TP48A	QC7
Depth	-----	0-0.1	0-0.1	0.5-0.6	-
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25
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	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	94	95	99

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Your Reference	-----	TP07	TP08	TP17	TP18	TP19
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	230	110	110
TRHC ₂₉ - C ₃₆	mg/kg	<100	220	410	350	410
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	96	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	96	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	250	480	360	400
TRH>C ₃₄ -C ₄₀	mg/kg	<100	100	240	220	260
Surrogate o-Terphenyl	%	93	90	92	94	83

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Your Reference	-----	TP20	TP20	TP24	TP25	TP29A
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	110	<100	<100	<100	290
TRHC ₂₉ - C ₃₆	mg/kg	320	<100	180	250	170
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	340	<100	180	250	420
TRH>C ₃₄ -C ₄₀	mg/kg	180	<100	130	190	100
Surrogate o-Terphenyl	%	70	93	91	88	89

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	117389-16	117389-18	117389-19	117389-21
Your Reference	-----	TP30	TP42	TP48A	QC7
Depth	-----	0-0.1	0-0.1	0.5-0.6	-
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	62	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	250	460	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	400	650	<100	200
TRH>C ₁₀ -C ₁₆	mg/kg	54	110	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	54	110	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	520	870	<100	210
TRH>C ₃₄ -C ₄₀	mg/kg	220	470	<100	110
Surrogate o-Terphenyl	%	89	93	87	92

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-1 TP07 0-0.1 9/10/2014 Soil	117389-3 TP08 0-0.1 9/10/2014 Soil	117389-5 TP17 0-0.1 9/10/2014 Soil	117389-7 TP18 0-0.1 9/10/2014 Soil	117389-9 TP19 0-0.1 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	0.4	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.26	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	1.9	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	72	92	96	90	85

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-11 TP20 0-0.1 9/10/2014 Soil	117389-12 TP20 0.5-0.6 9/10/2014 Soil	117389-13 TP24 0-0.1 9/10/2014 Soil	117389-14 TP25 0-0.1 9/10/2014 Soil	117389-15 TP29A 0.2-0.3 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	12
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.5
Fluoranthene	mg/kg	0.1	<0.1	<0.1	0.1	16
Pyrene	mg/kg	0.1	<0.1	<0.1	0.1	14
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	4.3
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	4.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	8.1
Benzo(a)pyrene	mg/kg	0.06	<0.05	<0.05	<0.05	5.9
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	3.9
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	4.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	8.1
Total Positive PAHs	mg/kg	0.31	NIL (+)VE	NIL (+)VE	0.22	77
Surrogate p-Terphenyl-d14	%	70	91	97	95	89

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-16 TP30 0-0.1 9/10/2014 Soil	117389-18 TP42 0-0.1 9/10/2014 Soil	117389-19 TP48A 0.5-0.6 9/10/2014 Soil	117389-21 QC7 - 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.2
Benzo(a)pyrene	mg/kg	0.06	<0.05	<0.05	0.16
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.16	NIL (+)VE	NIL (+)VE	0.92
Surrogate p-Terphenyl-d14	%	91	99	97	99

Total Phenolics in Soil			
Our Reference:	UNITS	117389-15	117389-19
Your Reference	-----	TP29A	TP48A
Depth	-----	0.2-0.3	0.5-0.6
Date Sampled		9/10/2014	9/10/2014
Type of sample		Soil	Soil
Date extracted	-	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014
Total Phenolics (as Phenol)	mg/kg	<5	<5

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Your Reference	-----	TP07	TP08	TP17	TP18	TP19
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	95	90	96	98

Organochlorine Pesticides in soil						
Our Reference:	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Your Reference	-----	TP20	TP20	TP24	TP25	TP29A
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	93	93	99	92

Organochlorine Pesticides in soil				
Our Reference:	UNITS	117389-16	117389-18	117389-19
Your Reference	-----	TP30	TP42	TP48A
Depth	-----	0-0.1	0-0.1	0.5-0.6
Date Sampled		9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014
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	%	109	122	91

Organophosphorus Pesticides						
Our Reference:	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Your Reference	-----	TP07	TP08	TP17	TP18	TP19
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	95	90	96	98

Organophosphorus Pesticides						
Our Reference:	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Your Reference	-----	TP20	TP20	TP24	TP25	TP29A
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	93	93	99	92

Organophosphorus Pesticides				
Our Reference:	UNITS	117389-16	117389-18	117389-19
Your Reference	-----	TP30	TP42	TP48A
Depth	-----	0-0.1	0-0.1	0.5-0.6
Date Sampled		9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos	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	%	109	122	91

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-1 TP07 0-0.1 9/10/2014 Soil	117389-3 TP08 0-0.1 9/10/2014 Soil	117389-5 TP17 0-0.1 9/10/2014 Soil	117389-7 TP18 0-0.1 9/10/2014 Soil	117389-9 TP19 0-0.1 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	95	90	96	98

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-11 TP20 0-0.1 9/10/2014 Soil	117389-12 TP20 0.5-0.6 9/10/2014 Soil	117389-13 TP24 0-0.1 9/10/2014 Soil	117389-14 TP25 0-0.1 9/10/2014 Soil	117389-15 TP29A 0.2-0.3 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014	12/10/2014	12/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	81	93	93	99	92

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117389-16 TP30 0-0.1 9/10/2014 Soil	117389-18 TP42 0-0.1 9/10/2014 Soil	117389-19 TP48A 0.5-0.6 9/10/2014 Soil
Date extracted	-	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	12/10/2014	12/10/2014	12/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	109	122	91

Acid Extractable metals in soil						
Our Reference:	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Your Reference	-----	TP07	TP08	TP17	TP18	TP19
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Arsenic	mg/kg	8	5	6	4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	17	15	16	19	19
Copper	mg/kg	3	5	5	4	5
Lead	mg/kg	18	32	47	39	51
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1	2	2	2
Zinc	mg/kg	14	19	20	21	17

Acid Extractable metals in soil						
Our Reference:	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Your Reference	-----	TP20	TP20	TP24	TP25	TP29A
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Arsenic	mg/kg	<4	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.5	<0.4
Chromium	mg/kg	10	13	13	55	11
Copper	mg/kg	6	1	13	10	4
Lead	mg/kg	34	9	46	40	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	<1	4	4	3
Zinc	mg/kg	18	1	39	37	9
Iron	mg/kg	[NA]	3,900	[NA]	[NA]	[NA]

Acid Extractable metals in soil Our Reference: Your Reference	UNITS -----	117389-16 TP30	117389-18 TP42	117389-19 TP48A	117389-21 QC7	117389-23 TP29A - TRIPLICATE
Depth	-----	0-0.1	0-0.1	0.5-0.6	-	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Arsenic	mg/kg	14	4	7	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	13	29	17	14
Copper	mg/kg	4	10	<1	5	4
Lead	mg/kg	53	76	20	31	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	3	1	1	3
Zinc	mg/kg	21	49	3	18	10

Miscellaneous Inorg - soil		
Our Reference:	UNITS	117389-12
Your Reference	-----	TP20
Depth	-----	0.5-0.6
Date Sampled		9/10/2014
Type of sample		Soil
Date prepared	-	10/10/2014
Date analysed	-	15/10/2014
Clay in soils <2um	% (w/w)	60
pH 1:5 soil:water	pH Units	4.4
Total Organic Carbon (Walkley Black)	mg/kg	24,000

CEC		
Our Reference:	UNITS	117389-12
Your Reference	-----	TP20
Depth	-----	0.5-0.6
Date Sampled		9/10/2014
Type of sample		Soil
Date extracted	-	10/10/2014
Date analysed	-	10/10/2014
Exchangeable Ca	meq/100g	<0.1
Exchangeable K	meq/100g	<0.1
Exchangeable Mg	meq/100g	<0.1
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	<1.0

Moisture						
Our Reference:	UNITS	117389-1	117389-3	117389-5	117389-7	117389-9
Your Reference	-----	TP07	TP08	TP17	TP18	TP19
Depth	-----	0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
Moisture	%	16	15	36	26	23

Moisture						
Our Reference:	UNITS	117389-11	117389-12	117389-13	117389-14	117389-15
Your Reference	-----	TP20	TP20	TP24	TP25	TP29A
Depth	-----	0-0.1	0.5-0.6	0-0.1	0-0.1	0.2-0.3
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014	11/10/2014
Moisture	%	19	19	40	28	11

Moisture					
Our Reference:	UNITS	117389-16	117389-18	117389-19	117389-21
Your Reference	-----	TP30	TP42	TP48A	QC7
Depth	-----	0-0.1	0-0.1	0.5-0.6	-
Date Sampled		9/10/2014	9/10/2014	9/10/2014	9/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	10/10/2014	10/10/2014	10/10/2014	10/10/2014
Date analysed	-	11/10/2014	11/10/2014	11/10/2014	11/10/2014
Moisture	%	28	25	19	15

Asbestos ID - soils			
Our Reference:	UNITS	117389-15	117389-19
Your Reference:	-----	TP29A	TP48A
Depth	-----	0.2-0.3	0.5-0.6
Date Sampled		9/10/2014	9/10/2014
Type of sample		Soil	Soil
Date analysed	-	14/10/2014	14/10/2014
Sample mass tested	g	Approx 50g	Approx 90g
Sample Description	-	Grey coarse-grained soil & rocks	Pink coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected

Asbestos ID - materials		
Our Reference:	UNITS	117389-22
Your Reference	-----	TP7
Depth	-----	0-0.1
Date Sampled		9/10/2014
Type of sample		Material
Date analysed	-	14/10/2014
Mass / Dimension of Sample	-	87x80x5mm
Sample Description	-	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected

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)-BTEX 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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
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.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2um reported.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-036	Total Organic Carbon - A titrimetric method that measures the oxidisable organic content of soils. Based upon Walkley/Black and 'Rayment and Lyons 2011'.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soil based on Rayment and Lyons 2011.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

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	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			11/10/2014	117389-1	11/10/2014 11/10/2014	LCS-4	11/10/2014
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	117389-1	<25 <25	LCS-4	89%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	117389-1	<25 <25	LCS-4	89%
Benzene	mg/kg	0.2	Org-016	<0.2	117389-1	<0.2 <0.2	LCS-4	79%
Toluene	mg/kg	0.5	Org-016	<0.5	117389-1	<0.5 <0.5	LCS-4	90%
Ethylbenzene	mg/kg	1	Org-016	<1	117389-1	<1 <1	LCS-4	91%
m+p-xylene	mg/kg	2	Org-016	<2	117389-1	<2 <2	LCS-4	93%
o-Xylene	mg/kg	1	Org-016	<1	117389-1	<1 <1	LCS-4	94%
naphthalene	mg/kg	1	Org-014	<1	117389-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	104	117389-1	99 98 RPD: 1	LCS-4	83%
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	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			11/10/2014	117389-1	11/10/2014 11/10/2014	LCS-4	11/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	117389-1	<50 <50	LCS-4	127%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	117389-1	<100 <100	LCS-4	136%
TRHC ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	117389-1	<100 110	LCS-4	104%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	117389-1	<50 <50	LCS-4	127%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	117389-1	<100 100	LCS-4	136%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	117389-1	<100 <100	LCS-4	104%
Surrogate o-Terphenyl	%		Org-003	93	117389-1	93 84 RPD: 10	LCS-4	109%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	86%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	82%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	85%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	90%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	90%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	LCS-4	81%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	117389-1	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	117389-1	<0.05 <0.05	LCS-4	124%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	89	117389-1	72 83 RPD: 14	LCS-4	92%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
Date analysed	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	LCS-1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			12/10/2014	117389-1	12/10/2014 12/10/2014	LCS-4	12/10/2014
HCB	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	107%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	103%
Heptachlor	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	99%
delta-BHC	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	107%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	106%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	96%
Dieldrin	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	108%
Endrin	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	97%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
pp-DDD	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	109%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	LCS-4	102%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	97	117389-1	100 93 RPD: 7	LCS-4	95%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			12/10/2014	117389-1	12/10/2014 12/10/2014	LCS-4	12/10/2014
Diazinon	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	LCS-4	96%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	LCS-4	84%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	117389-1	<0.1 <0.1	LCS-4	115%
Surrogate TCMX	%		Org-008	97	117389-1	100 93 RPD: 7	LCS-4	97%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-4	10/10/2014
Date analysed	-			12/10/2014	117389-1	12/10/2014 12/10/2014	LCS-4	12/10/2014
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	LCS-4	114%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	117389-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	97	117389-1	100 93 RPD: 7	LCS-4	100%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-1	10/10/2014
Date analysed	-			10/10/2014	117389-1	10/10/2014 10/10/2014	LCS-1	10/10/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	117389-1	8 6 RPD: 29	LCS-1	93%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	117389-1	<0.4 <0.4	LCS-1	102%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	117389-1	17 15 RPD: 12	LCS-1	100%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	117389-1	3 4 RPD: 29	LCS-1	100%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	117389-1	18 19 RPD: 5	LCS-1	94%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	117389-1	<0.1 <0.1	LCS-1	87%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	117389-1	2 2 RPD: 0	LCS-1	98%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	117389-1	14 15 RPD: 7	LCS-1	96%
Iron	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	101%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base II Duplicate II %RPD		
Date prepared	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
Date analysed	-			15/10/2014	[NT]	[NT]	LCS-1	15/10/2014
Clay in soils <2um	% (w/w)		AS1289.3.6 .3	[NT]	[NT]	[NT]	[NR]	[NR]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	103%
Total Organic Carbon (Walkley Black)	mg/kg	1000	Inorg-036	<1000	[NT]	[NT]	LCS-1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base II Duplicate II %RPD		
Date extracted	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
Date analysed	-			10/10/2014	[NT]	[NT]	LCS-1	10/10/2014
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	106%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
Cation Exchange Capacity	meq/100 g	1	Metals-009	<1.0	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	11/10/2014 11/10/2014	117389-3	11/10/2014
TRHC ₆ - C ₉	mg/kg	117389-15	<25 <25	117389-3	106%
TRHC ₆ - C ₁₀	mg/kg	117389-15	<25 <25	117389-3	106%
Benzene	mg/kg	117389-15	<0.2 <0.2	117389-3	96%
Toluene	mg/kg	117389-15	<0.5 <0.5	117389-3	108%
Ethylbenzene	mg/kg	117389-15	<1 <1	117389-3	108%
m+p-xylene	mg/kg	117389-15	<2 <2	117389-3	110%
o-Xylene	mg/kg	117389-15	<1 <1	117389-3	110%
naphthalene	mg/kg	117389-15	<1 <1	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	117389-15	101 100 RPD: 1	117389-3	97%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	11/10/2014 11/10/2014	117389-3	11/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	117389-15	<50 <50	117389-3	115%
TRHC ₁₅ - C ₂₈	mg/kg	117389-15	290 150 RPD: 64	117389-3	#
TRHC ₂₉ - C ₃₆	mg/kg	117389-15	170 130 RPD: 27	117389-3	#
TRH>C ₁₀ -C ₁₆	mg/kg	117389-15	<50 <50	117389-3	115%
TRH>C ₁₆ -C ₃₄	mg/kg	117389-15	420 240 RPD: 55	117389-3	#
TRH>C ₃₄ -C ₄₀	mg/kg	117389-15	100 <100	117389-3	#
Surrogate o-Terphenyl	%	117389-15	89 92 RPD: 3	117389-3	106%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Naphthalene	mg/kg	117389-15	0.3 0.1 RPD: 100	117389-3	80%
Acenaphthylene	mg/kg	117389-15	0.4 0.3 RPD: 29	[NR]	[NR]
Acenaphthene	mg/kg	117389-15	0.3 0.3 RPD: 0	[NR]	[NR]
Fluorene	mg/kg	117389-15	1.1 0.5 RPD: 75	117389-3	71%
Phenanthrene	mg/kg	117389-15	12 6.8 RPD: 55	117389-3	75%
Anthracene	mg/kg	117389-15	1.5 1 RPD: 40	[NR]	[NR]
Fluoranthene	mg/kg	117389-15	16 9.8 RPD: 48	117389-3	79%
Pyrene	mg/kg	117389-15	14 9.3 RPD: 40	117389-3	80%
Benzo(a)anthracene	mg/kg	117389-15	4.3 2.7 RPD: 46	[NR]	[NR]
Chrysene	mg/kg	117389-15	4.1 2.6 RPD: 45	117389-3	69%
Benzo(b,j+k)fluoranthene	mg/kg	117389-15	8.1 5.3 RPD: 42	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117389-15	5.9 3.8 RPD: 43	117389-3	109%
Indeno(1,2,3-c,d)pyrene	mg/kg	117389-15	3.9 2.5 RPD: 44	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117389-15	0.4 0.3 RPD: 29	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	117389-15	4.1 2.7 RPD: 41	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117389-15	89 94 RPD: 5	117389-3	94%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	12/10/2014 12/10/2014	117389-3	12/10/2014
HCB	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	117389-15	<0.1 <0.1	117389-3	103%
gamma-BHC	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	117389-15	<0.1 <0.1	117389-3	97%
Heptachlor	mg/kg	117389-15	<0.1 <0.1	117389-3	95%
delta-BHC	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	117389-15	<0.1 <0.1	117389-3	103%
Heptachlor Epoxide	mg/kg	117389-15	<0.1 <0.1	117389-3	101%
gamma-Chlordane	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	117389-15	<0.1 <0.1	117389-3	92%
Dieldrin	mg/kg	117389-15	<0.1 <0.1	117389-3	103%
Endrin	mg/kg	117389-15	<0.1 <0.1	117389-3	100%
pp-DDD	mg/kg	117389-15	<0.1 <0.1	117389-3	103%
Endosulfan II	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	117389-15	<0.1 <0.1	117389-3	100%
Methoxychlor	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	117389-15	92 96 RPD: 4	117389-3	94%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	12/10/2014 12/10/2014	117389-3	12/10/2014
Diazinon	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Dimethoate	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos-methyl	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Ronnel	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	117389-15	<0.1 <0.1	117389-3	95%
Fenitrothion	mg/kg	117389-15	<0.1 <0.1	117389-3	78%
Bromophos-ethyl	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	117389-15	<0.1 <0.1	117389-3	120%
Surrogate TCMX	%	117389-15	92 96 RPD: 4	117389-3	89%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	12/10/2014 12/10/2014	117389-3	12/10/2014
Arochlor 1016	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	117389-15	<0.1 <0.1	117389-3	102%
Arochlor 1260	mg/kg	117389-15	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	117389-15	92 96 RPD: 4	117389-3	91%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Date analysed	-	117389-15	10/10/2014 10/10/2014	117389-3	10/10/2014
Arsenic	mg/kg	117389-15	<4 4	117389-3	85%
Cadmium	mg/kg	117389-15	<0.4 <0.4	117389-3	94%
Chromium	mg/kg	117389-15	11 19 RPD: 53	117389-3	100%
Copper	mg/kg	117389-15	4 4 RPD: 0	117389-3	103%
Lead	mg/kg	117389-15	10 11 RPD: 10	117389-3	92%
Mercury	mg/kg	117389-15	<0.1 <0.1	117389-3	82%
Nickel	mg/kg	117389-15	3 3 RPD: 0	117389-3	83%
Zinc	mg/kg	117389-15	9 10 RPD: 11	117389-3	89%
Iron	mg/kg	[NT]	[NT]	117389-3	N/A

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date digested	-	117389-12	10/10/2014 10/10/2014
Date analysed	-	117389-12	10/10/2014 10/10/2014
Arsenic	mg/kg	117389-12	<4 <4
Cadmium	mg/kg	117389-12	<0.4 <0.4
Chromium	mg/kg	117389-12	13 12 RPD: 8
Copper	mg/kg	117389-12	1 1 RPD: 0
Lead	mg/kg	117389-12	9 10 RPD: 11
Mercury	mg/kg	117389-12	<0.1 <0.1
Nickel	mg/kg	117389-12	<1 <1
Zinc	mg/kg	117389-12	1 1 RPD: 0
Iron	mg/kg	117389-12	3900 4400 RPD: 12

Report Comments:

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteriae has been exceeded for 117389-15 for Cr. Therefore a triplicate result has been issued as laboratory sample number 117389-22.

Total Recoverable Hydrocarbons in soil: # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

PAH in soil: The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Paul Ching

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.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

CHAIN OF CUSTODY FORM

PROJECT: North Sydney 30011256		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT ☐ Non Standard TAT (List due date):		LAB: EnviroLab ATTENTION: David Springer DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashley St Chatswood	
PROJECT NUMBER: NBH		LAB QUOTE NO.: 1454196		COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
PROJECT MANAGER: Chris Masters		CONTACT PH: 0413456085			
SAMPLED BY: Penelope Ford					
DATE SAMPLED: 13.10.14		RELINQUISHED BY: Penelope Ford		RECEIVED BY: ELS	
Email Reports to (will default to PM if blank): daniel.sanders@smec.co		DATE/TIME: 13.10.14 3:30pm		DATE/TIME: 13/10/14 16:00	
Email Invoice to (will default to PM if blank):					
Special Laboratory Instructions:					

Please provide ES DAT

SAMPLE DETAILS			ANALYSIS REQUIRED					COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Cowd 79	Cowd 39	PH	CEC
1	TP47/0.1-0.2	13.10.14 5		250ml jar + 21 block	2				
2	TP47/0.1-0.2								
3	TP47/0.5-0.6								
4	TP53/0.1-0.2								
5	TP53/0.6-0.7								
6	TP54/0.1-0.2								
7	TP54/0.6-0.7								
8	TP54/1.0-1.1								
9	TP54A/0.4-0.5								
10	TP55/0.1-0.2								
11	TP56/0.1-0.2								
TOTAL									

EnviroLab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200



Job No: 117545
13/10/14

Date Received: 13/10/14
Time Received: 16:00
Received by:
Temp: Cool/Ambient
Cooling: Ice/Leakback
Security: Intact/Broken/None



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT		LAB: EnviroLab	
PROJECT: NATH		☐ Non Standard TAT (List due date):		ATTENTION: David Springer	
PROJECT NUMBER: 3004 256 014		LAB QUOTE NO.: 1457196		DISPATCH TO (ADDRESS & PHONE NO.): 12 Ashleyst chotswood	
PROJECT MANAGER: Chris Masters		CONTACT PH:			
SAMPLED BY: P. Ford					
DATE SAMPLED: 13.10.14		RELINQUISHED BY: Daniel Sanders		RECEIVED BY: ELS	
Email Reports to (will default to PM if blank):		DATE/TIME: 13.10.14 3:30p		DATE/TIME: 13/10/14 18.00	
Email Invoice to (will default to PM if blank):					
Special Laboratory Instructions:					

Please provide ES DAT

SAMPLE DETAILS			ANALYSIS REQUIRED					COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Condo 79	Condo 39	PH	CEC
12	TP56/0.5-0.6	13.10.14	5	250ml jar + 21 plastic	2				
13	TP57/0.1-0.2								
14	TP57/0.7-0.8								
15	TP58/0.1-0.2								
16	TP58/0.6-0.7								
17	TP58A/0.1-0.2								
18	TP58A/0.4-0.5								
19	TP59/0.1-0.2								
20	TP59/0.6-0.7								
21	TP59A/0.0-0.1								
22	TP59A/0.5-0.6								
TOTAL:									

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd. Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney	TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT ☐ Non Standard TAT (List due date):	LAB: EnviroLab
PROJECT: NQH		ATTENTION: David Springer
PROJECT NUMBER: 20011256.014	LAB QUOTE NO.: 1454196	DISPATCH TO (ADDRESS & PHONE NO.):
PROJECT MANAGER: Chris Masters	CONTACT PH: 041 3456085	
SAMPLED BY: Penelope Ford		
DATE SAMPLED: 13.10.14	RELINQUISHED BY: Penelope Ford	RECEIVED BY: ELS
Email Reports to (will default to PM if blank):	DATE/TIME: 13.10.14	DATE/TIME: 13/10/14 16.00
Email Invoice to (will default to PM if blank):		
Special Laboratory Instructions:		

Please provide ES0AT

SAMPLE DETAILS			ANALYSIS REQUIRED					COMMENTS
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS	Combi 7g	Combi 3g	
23	TP60/0-0.1	13.10.14	5	250ul. ZIP for + 10ch	2		✓	
24	TP60/0.5-0.6							
25	TP61/0.1-0.2					✓		
26	TP61/0.5-0.6					✓		
27	TP62/0.1-0.2					✓		
28	TP62/0.9-1.0					✓		
29	TP62/1.4-1.5							
30	TP62A/0-0.1					✓		
31	TP63/0-0.1					✓		
32	QC9					✓		
TOTAL								

SMEC OFFICE:	North Sydney	TURNAROUND REQUIREMENTS:		☒ Standard - 5 day TAT	LAB:	ALS
PROJECT:	30011256-01A			☐ Non Standard TAT (List due date):	ATTENTION:	
PROJECT NUMBER:	NBH	LAB QUOTE NO.:			DISPATCH TO (ADDRESS & PHONE NO.):	
PROJECT MANAGER:	Chris Warden	CONTACT PH:	091395085		227-289 Woodpark Rd	
SAMPLED BY:	Penelope Ford				Smithfield NSW	
DATE SAMPLED:	13.10.14	RELINQUISHED BY:	[Signature]		RELINQUISHED BY:	ECS
Email Reports to (will default to PM if blank):	daniel.sanders	DATE/TIME:	13.10.14 3:30pm		DATE/TIME:	18/10/14 16:00
Email Invoice to (will default to PM if blank):						

Please forward to ALS.

[illegible]

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney NSW 2060

ph: 02 9925 5555
Fax: 02 9925 5566

Attention: Penelope Ford, Daniel Saunders

Sample log in details:

Your reference:	30011256
Envirolab Reference:	117545
Date received:	13/10/14
Date results expected to be reported:	20/10/14

Samples received in appropriate condition for analysis:	YES
No. of samples provided	34 Soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	17.1
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

If there is sufficient sample after testing, samples will be held for the following time frames from date of receipt of samples:
Water samples - 1 month
Soil and other solid samples - 2 months
Samples collected in canisters - 1 week. Canisters will then be cleaned.
All other samples are not retained after analysis
If you require samples to be retained for longer periods then retention fees will apply as per our pricelist.

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

117545

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney
NSW 2060

Attention: Penelope Ford, Daniel Saunders

Sample log in details:

Your Reference:	30011256	
No. of samples:	34 Soils	
Date samples received / completed instructions received	13/10/14	/ 13/10/14

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:	20/10/14	/	20/10/14
Date of Preliminary Report:	Not Issued		

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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: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-1 TP47 0-0.1 13/10/2014 Soil	117545-2 TP47 0.1-0.2 13/10/2014 Soil	117545-4 TP53 0.1-0.2 13/10/2014 Soil	117545-6 TP54 0.1-0.2 13/10/2014 Soil	117545-9 TP54A 0.4-0.5 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	120	110	87	139	138

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-10 TP55 0.1-0.2 13/10/2014 Soil	117545-11 TP56 0.1-0.2 13/10/2014 Soil	117545-13 TP57 0.1-0.2 13/10/2014 Soil	117545-15 TP58 0.1-0.2 13/10/2014 Soil	117545-18 TP58A 0.4-0.5 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	70	90	71	81

vTRH(C6-C10)/BTEXN in Soil	UNITS	117545-19	117545-21	117545-23	117545-25	117545-26
Our Reference:	-----	TP59	TP59A	TP60	TP61	TP61
Your Reference	-----	0.1-0.2	0-0.1	0-0.1	0.1-0.2	0.5-0.6
Depth		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	14/10/2014	14/10/201	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	111	117	70	107

vTRH(C6-C10)/BTEXN in Soil	UNITS	117545-27	117545-28	117545-30	117545-31	117545-32
Our Reference:	-----	TP62	TP62	TP62A	TP63	QC9
Your Reference	-----	0.1-0.2	0.9-1.0	0-0.1	0-0.1	-
Depth		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	74	79	81	83	81

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	117545-33
Your Reference	-----	QC10
Depth	-----	-
Date Sampled		13/10/2014
Type of sample		Soil
Date extracted	-	14/10/2014
Date analysed	-	15/10/2014
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	83

svTRH (C10-C40) in Soil	UNITS	117545-1	117545-2	117545-4	117545-6	117545-9
Our Reference:	-----	TP47	TP47	TP53	TP54	TP54A
Your Reference	-----	0-0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Depth		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	109	126	92	87	86

svTRH (C10-C40) in Soil	UNITS	117545-10	117545-11	117545-13	117545-15	117545-18
Our Reference:	-----	TP55	TP56	TP57	TP58	TP58A
Your Reference	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Depth		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	15/10/2014	15/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	89	85	90	87	86

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117545-19	117545-21	117545-23	117545-25	117545-26
Your Reference	-----	TP59	TP59A	TP60	TP61	TP61
Depth	-----	0.1-0.2	0-0.1	0-0.1	0.1-0.2	0.5-0.6
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	210	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	230	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	100	<100	<100	<100
Surrogate o-Terphenyl	%	87	91	90	84	87

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	117545-27	117545-28	117545-30	117545-31	117545-32
Your Reference	-----	TP62	TP62	TP62A	TP63	QC9
Depth	-----	0.1-0.2	0.9-1.0	0-0.1	0-0.1	-
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	130	180	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	200	380	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	50	79	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	50	79	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	260	430	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	120	230	<100
Surrogate o-Terphenyl	%	89	89	90	87	85

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	117545-33
Your Reference	-----	QC10
Depth	-----	-
Date Sampled		13/10/2014
Type of sample		Soil
Date extracted	-	14/10/2014
Date analysed	-	15/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Surrogate o-Terphenyl	%	88

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-1 TP47 0-0.1 13/10/2014 Soil	117545-2 TP47 0.1-0.2 13/10/2014 Soil	117545-4 TP53 0.1-0.2 13/10/2014 Soil	117545-6 TP54 0.1-0.2 13/10/2014 Soil	117545-9 TP54A 0.4-0.5 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.14	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	0.96	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96	88	99	90	92

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-10 TP55 0.1-0.2 13/10/2014 Soil	117545-11 TP56 0.1-0.2 13/10/2014 Soil	117545-13 TP57 0.1-0.2 13/10/2014 Soil	117545-15 TP58 0.1-0.2 13/10/2014 Soil	117545-18 TP58A 0.4-0.5 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96	91	94	94	94

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-19 TP59 0.1-0.2 13/10/2014 Soil	117545-21 TP59A 0-0.1 13/10/2014 Soil	117545-23 TP60 0-0.1 13/10/2014 Soil	117545-25 TP61 0.1-0.2 13/10/2014 Soil	117545-26 TP61 0.5-0.6 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.3	<0.1	0.1	<0.1
Pyrene	mg/kg	<0.1	0.3	<0.1	0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(b,j,k)fluoranthene	mg/kg	<0.2	0.3	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.14	<0.05	0.06	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	1.4	NIL (+)VE	0.32	NIL (+)VE
Surrogate p-Terphenyl-d14	%	96	97	99	89	96

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-27 TP62 0.1-0.2 13/10/2014 Soil	117545-28 TP62 0.9-1.0 13/10/2014 Soil	117545-30 TP62A 0-0.1 13/10/2014 Soil	117545-31 TP63 0-0.1 13/10/2014 Soil	117545-32 QC9 - 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.8	0.1	0.1	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	2.5	0.1	0.2	<0.1	0.2
Pyrene	mg/kg	2.6	0.1	0.2	<0.1	0.2
Benzo(a)anthracene	mg/kg	1.3	<0.1	0.1	<0.1	0.1
Chrysene	mg/kg	1.3	<0.1	0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	1.9	<0.2	0.2	<0.2	0.2
Benzo(a)pyrene	mg/kg	1.4	0.07	0.14	<0.05	0.12
Indeno(1,2,3-c,d)pyrene	mg/kg	0.9	<0.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.6	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	1.8	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	14	0.45	1.3	NIL(+)/VE	0.98
Surrogate p-Terphenyl-d14	%	98	96	99	96	96

PAHs in Soil		
Our Reference:	UNITS	117545-33
Your Reference	-----	QC10
Depth	-----	-
Date Sampled		13/10/2014
Type of sample		Soil
Date extracted	-	14/10/2014
Date analysed	-	15/10/2014
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.2
Pyrene	mg/kg	0.2
Benzo(a)anthracene	mg/kg	0.1
Chrysene	mg/kg	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2
Benzo(a)pyrene	mg/kg	0.12
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5
Total Positive PAHs	mg/kg	1.2
Surrogate p-Terphenyl-d14	%	98

Total Phenolics in Soil					
Our Reference:	UNITS	117545-2	117545-4	117545-25	117545-28
Your Reference:	-----	TP47	TP53	TP61	TP62
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Organochlorine Pesticides in soil					
Our Reference:	UNITS	117545-2	117545-4	117545-25	117545-28
Your Reference	-----	TP47	TP53	TP61	TP62
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.9-1.0
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	88	79	89

PCBs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-2 TP47 0.1-0.2 13/10/2014 Soil	117545-4 TP53 0.1-0.2 13/10/2014 Soil	117545-25 TP61 0.1-0.2 13/10/2014 Soil	117545-28 TP62 0.9-1.0 13/10/2014 Soil
Date extracted	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	87	88	79	89

Acid Extractable metals in soil						
Our Reference:	UNITS	117545-1	117545-2	117545-4	117545-6	117545-9
Your Reference	-----	TP47	TP47	TP53	TP54	TP54A
Depth	-----	0-0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	<4	5	8	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	25	25	11	19
Copper	mg/kg	8	13	4	5	2
Lead	mg/kg	14	19	31	24	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	19	2	1	1
Zinc	mg/kg	43	19	40	6	3
Iron	mg/kg	8,600	14,000	34,000	2,800	14,000

Acid Extractable metals in soil						
Our Reference:	UNITS	117545-10	117545-11	117545-13	117545-15	117545-18
Your Reference	-----	TP55	TP56	TP57	TP58	TP58A
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	12	<4	5	5	5
Cadmium	mg/kg	0.7	<0.4	0.5	<0.4	<0.4
Chromium	mg/kg	24	10	14	15	18
Copper	mg/kg	4	5	9	14	23
Lead	mg/kg	35	15	44	60	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	4	2	3	2
Zinc	mg/kg	21	33	81	89	3
Iron	mg/kg	59,000	13,000	22,000	12,000	11,000

Acid Extractable metals in soil						
Our Reference:	UNITS	117545-19	117545-21	117545-23	117545-25	117545-26
Your Reference	-----	TP59	TP59A	TP60	TP61	TP61
Depth	-----	0.1-0.2	0-0.1	0-0.1	0.1-0.2	0.5-0.6
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	5	<4	11	7	5
Cadmium	mg/kg	<0.4	0.5	0.5	3	<0.4
Chromium	mg/kg	17	12	18	20	14
Copper	mg/kg	9	23	2	14	26
Lead	mg/kg	25	86	18	74	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	4	1	2	<1
Zinc	mg/kg	45	120	12	110	3
Iron	mg/kg	21,000	12,000	53,000	51,000	8,200

Acid Extractable metals in soil						
Our Reference:	UNITS	117545-27	117545-28	117545-30	117545-31	117545-32
Your Reference	-----	TP62	TP62	TP62A	TP63	QC9
Depth	-----	0.1-0.2	0.9-1.0	0-0.1	0-0.1	-
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Arsenic	mg/kg	10	9	5	<4	<4
Cadmium	mg/kg	0.5	1	0.4	0.4	<0.4
Chromium	mg/kg	15	21	14	30	15
Copper	mg/kg	170	17	11	17	10
Lead	mg/kg	120	61	130	200	17
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	3	4	25	7
Zinc	mg/kg	110	70	97	100	36
Iron	mg/kg	24,000	63,000	17,000	17,000	11,000

Acid Extractable metals in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-33 QC10 - 13/10/2014 Soil	117545-35 TP54 - TRIPLICATE 0.1-0.2 13/10/2014 Soil
Date digested	-	14/10/2014	14/10/2014
Date analysed	-	14/10/2014	14/10/2014
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	14	14
Copper	mg/kg	15	7
Lead	mg/kg	23	21
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	8	2
Zinc	mg/kg	46	14
Iron	mg/kg	12,000	5,700

Moisture						
Our Reference:	UNITS	117545-1	117545-2	117545-4	117545-6	117545-9
Your Reference	-----	TP47	TP47	TP53	TP54	TP54A
Depth	-----	0-0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	8.1	11	17	17	11

Moisture						
Our Reference:	UNITS	117545-10	117545-11	117545-13	117545-15	117545-18
Your Reference	-----	TP55	TP56	TP57	TP58	TP58A
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	16	7.7	11	22	20

Moisture						
Our Reference:	UNITS	117545-19	117545-21	117545-23	117545-25	117545-26
Your Reference	-----	TP59	TP59A	TP60	TP61	TP61
Depth	-----	0.1-0.2	0-0.1	0-0.1	0.1-0.2	0.5-0.6
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	28	22	3.8	16	19

Moisture						
Our Reference:	UNITS	117545-27	117545-28	117545-30	117545-31	117545-32
Your Reference	-----	TP62	TP62	TP62A	TP63	QC9
Depth	-----	0.1-0.2	0.9-1.0	0-0.1	0-0.1	-
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/10/2014	14/10/2014	14/10/2014	14/10/2014	14/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Moisture	%	16	19	6.1	7.9	7.3

Moisture		
Our Reference:	UNITS	117545-33
Your Reference	-----	QC10
Depth	-----	-
Date Sampled		13/10/2014
Type of sample		Soil
Date prepared	-	14/10/2014
Date analysed	-	15/10/2014
Moisture	%	7.5

Asbestos ID - soils						
Our Reference:	UNITS	117545-1	117545-2	117545-4	117545-6	117545-9
Your Reference	-----	TP47	TP47	TP53	TP54	TP54A
Depth	-----	0-0.1	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 70g	Approx 70g	Approx 55g	Approx 60g	Approx 90g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey clayey soil & rocks	Beige clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	117545-10	117545-11	117545-13	117545-15	117545-18
Your Reference	-----	TP55	TP56	TP57	TP58	TP58A
Depth	-----	0.1-0.2	0.1-0.2	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		13/10/2014	13/10/2014	13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 70g	Approx 85g	Approx 65g	Approx 40g	Approx 60g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Beige coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-19 TP59 0.1-0.2 13/10/2014 Soil	117545-21 TP59A 0-0.1 13/10/2014 Soil	117545-23 TP60 0-0.1 13/10/2014 Soil	117545-25 TP61 0.1-0.2 13/10/2014 Soil	117545-26 TP61 0.5-0.6 13/10/2014 Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 35g	Approx 25g	Approx 75g	Approx 45g	Approx 35g
Sample Description	-	Grey coarse-grained soil & rocks	Brown coarse-grained soil	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Beige fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117545-27 TP62 0.1-0.2 13/10/2014 Soil	117545-28 TP62 0.9-1.0 13/10/2014 Soil	117545-30 TP62A 0-0.1 13/10/2014 Soil	117545-31 TP63 0-0.1 13/10/2014 Soil	117545-32 QC9 - 13/10/2014 Soil
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
Sample mass tested	g	Approx 65g	Approx 45g	Approx 60g	Approx 40g	Approx 30g
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Miscellaneous Inorg - soil				
Our Reference:	UNITS	117545-9	117545-18	117545-28
Your Reference	-----	TP54A	TP58A	TP62
Depth	-----	0.4-0.5	0.4-0.5	0.9-1.0
Date Sampled		13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil
Date prepared	-	13/10/2014	13/10/2014	13/10/2014
Date analysed	-	14/10/2014	14/10/2014	14/10/2014
pH 1:5 soil:water	pH Units	4.8	4.7	6.5

CEC				
Our Reference:	UNITS	117545-9	117545-18	117545-28
Your Reference	-----	TP54A	TP58A	TP62
Depth	-----	0.4-0.5	0.4-0.5	0.9-1.0
Date Sampled		13/10/2014	13/10/2014	13/10/2014
Type of sample		Soil	Soil	Soil
Date extracted	-	16/10/2014	16/10/2014	16/10/2014
Date analysed	-	17/10/2014	17/10/2014	17/10/2014
Exchangeable Ca	meq/100g	0.4	<0.1	15
Exchangeable K	meq/100g	0.1	0.2	0.1
Exchangeable Mg	meq/100g	0.55	0.47	1.3
Exchangeable Na	meq/100g	0.12	0.11	<0.1
Cation Exchange Capacity	meq/100g	1.2	<1.0	16

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)-BTEX 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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soil based on Rayment and Lyons 2011.

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	-			14/10/2014	117545-6	14/10/2014 14/10/2014	LCS-9	14/10/2014
Date analysed	-			15/10/2014	117545-6	15/10/2014 15/10/2014	LCS-9	15/10/2014
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	117545-6	<25 <25	LCS-9	104%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	117545-6	<25 <25	LCS-9	104%
Benzene	mg/kg	0.2	Org-016	<0.2	117545-6	<0.2 <0.2	LCS-9	101%
Toluene	mg/kg	0.5	Org-016	<0.5	117545-6	<0.5 <0.5	LCS-9	83%
Ethylbenzene	mg/kg	1	Org-016	<1	117545-6	<1 <1	LCS-9	109%
m+p-xylene	mg/kg	2	Org-016	<2	117545-6	<2 <2	LCS-9	114%
o-Xylene	mg/kg	1	Org-016	<1	117545-6	<1 <1	LCS-9	130%
naphthalene	mg/kg	1	Org-014	<1	117545-6	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	121	117545-6	139 92 RPD: 41	LCS-9	118%
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	-			14/10/2014	117545-6	14/10/2014 14/10/2014	LCS-9	14/10/2014
Date analysed	-			14/10/2014	117545-6	14/10/2014 14/10/2014	LCS-9	14/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	117545-6	<50 <50	LCS-9	134%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	117545-6	<100 <100	LCS-9	140%
TRHC ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	117545-6	<100 <100	LCS-9	109%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	117545-6	<50 <50	LCS-9	134%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	117545-6	<100 <100	LCS-9	140%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	117545-6	<100 <100	LCS-9	109%
Surrogate o-Terphenyl	%		Org-003	97	117545-6	87 89 RPD: 2	LCS-9	118%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/10/2014	117545-6	14/10/2014 14/10/2014	LCS-9	14/10/2014
Date analysed	-			14/10/2014	117545-6	14/10/2014 14/10/2014	LCS-9	14/10/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	90%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	86%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	86%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	86%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	88%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	LCS-9	83%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	117545-6	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	117545-6	<0.05 <0.05	LCS-9	94%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	117545-6	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	93	117545-6	90 95 RPD: 5	LCS-9	96%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Phenolics in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/10/2014	117545-2	14/10/2014 14/10/2014	LCS-1	14/10/2014
Date analysed	-			14/10/2014	117545-2	14/10/2014 14/10/2014	LCS-1	14/10/2014
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	117545-2	<5 <5	LCS-1	96%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			14/10/2014	[NT]	[NT]	LCS-1	14/10/2014
Date analysed	-			15/10/2014	[NT]	[NT]	LCS-1	15/10/2014
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	114%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	111%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	96%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	119%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	113%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	110%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	113%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	92%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	117%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	114%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	95	[NT]	[NT]	LCS-1	99%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			14/10/2014	[NT]	[NT]	LCS-1	14/10/2014
Date analysed	-			15/10/2014	[NT]	[NT]	LCS-1	15/10/2014
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-1	106%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	95	[NT]	[NT]	LCS-1	94%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			15/10/2014	117545-6	14/10/2014 14/10/2014	LCS-2	15/10/2014
Date analysed	-			15/10/2014	117545-6	14/10/2014 14/10/2014	LCS-2	15/10/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	117545-6	<4 <4	LCS-2	111%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	117545-6	<0.4 <0.4	LCS-2	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	11 22 RPD: 67	LCS-2	109%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	5 5 RPD: 0	LCS-2	112%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	24 19 RPD: 23	LCS-2	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	117545-6	<0.1 <0.1	LCS-2	120%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	1 1 RPD: 0	LCS-2	105%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	6 8 RPD: 29	LCS-2	105%
Iron	mg/kg	1	Metals-020 ICP-AES	<1	117545-6	2800 17000 RPD: 143	LCS-2	110%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorg - soil						Base Duplicate %RPD		
Date prepared	-			13/10/2014	117545-9	13/10/2014 13/10/2014	LCS-1	13/10/2014
Date analysed	-			14/10/2014	117545-9	14/10/2014 14/10/2014	LCS-1	14/10/2014
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	117545-9	4.8 4.8 RPD: 0	LCS-1	102%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base Duplicate %RPD		
Date extracted	-			16/10/2014	117545-9	16/10/2014 16/10/2014	LCS-1	16/10/2014
Date analysed	-			17/10/2014	117545-9	17/10/2014 17/10/2014	LCS-1	17/10/2014
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	117545-9	0.4 0.4 RPD: 0	LCS-1	107%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	117545-9	0.1 0.1 RPD: 0	LCS-1	112%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	117545-9	0.55 0.53 RPD: 4	LCS-1	119%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	117545-9	0.12 <0.1	LCS-1	110%
Cation Exchange Capacity	meq/100 g	1	Metals-009	<1.0	117545-9	1.2 1.1 RPD: 9	[NR]	[NR]
QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD		Spike Sm#	Spike % Recovery	
Date extracted	-	117545-26		14/10/2014 14/10/2014		117545-9	14/10/2014	
Date analysed	-	117545-26		15/10/2014 15/10/2014		117545-9	15/10/2014	
TRHC ₆ - C ₉	mg/kg	117545-26		<25 <25		117545-9	111%	
TRHC ₆ - C ₁₀	mg/kg	117545-26		<25 <25		117545-9	111%	
Benzene	mg/kg	117545-26		<0.2 <0.2		117545-9	97%	
Toluene	mg/kg	117545-26		<0.5 <0.5		117545-9	116%	
Ethylbenzene	mg/kg	117545-26		<1 <1		117545-9	113%	
m+p-xylene	mg/kg	117545-26		<2 <2		117545-9	114%	
o-Xylene	mg/kg	117545-26		<1 <1		117545-9	117%	
naphthalene	mg/kg	117545-26		<1 <1		[NR]	[NR]	
Surrogate aaa-Trifluorotoluene	%	117545-26		107 112 RPD: 5		117545-9	119%	

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117545-26	14/10/2014 14/10/2014	117545-9	14/10/2014
Date analysed	-	117545-26	15/10/2014 15/10/2014	117545-9	14/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	117545-26	<50 <50	117545-9	114%
TRHC ₁₅ - C ₂₈	mg/kg	117545-26	<100 <100	117545-9	119%
TRHC ₂₉ - C ₃₆	mg/kg	117545-26	<100 <100	117545-9	126%
TRH>C ₁₀ -C ₁₆	mg/kg	117545-26	<50 <50	117545-9	114%
TRH>C ₁₆ -C ₃₄	mg/kg	117545-26	<100 <100	117545-9	119%
TRH>C ₃₄ -C ₄₀	mg/kg	117545-26	<100 <100	117545-9	126%
Surrogate o-Terphenyl	%	117545-26	87 83 RPD: 5	117545-9	110%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	117545-26	14/10/2014 14/10/2014	117545-9	14/10/2014
Date analysed	-	117545-26	15/10/2014 15/10/2014	117545-9	14/10/2014
Naphthalene	mg/kg	117545-26	<0.1 <0.1	117545-9	98%
Acenaphthylene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	117545-26	<0.1 <0.1	117545-9	95%
Phenanthrene	mg/kg	117545-26	<0.1 <0.1	117545-9	100%
Anthracene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	117545-26	<0.1 <0.1	117545-9	101%
Pyrene	mg/kg	117545-26	<0.1 <0.1	117545-9	102%
Benzo(a)anthracene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	117545-26	<0.1 <0.1	117545-9	92%
Benzo(b,j,k)fluoranthene	mg/kg	117545-26	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	117545-26	<0.05 <0.05	117545-9	114%
Indeno(1,2,3-c,d)pyrene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	117545-26	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	117545-26	96 89 RPD: 8	117545-9	105%

QUALITY CONTROL Total Phenolics in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	117545-4	14/10/2014
Date analysed	-	[NT]	[NT]	117545-4	14/10/2014
Total Phenolics (as Phenol)	mg/kg	[NT]	[NT]	117545-4	101%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	117545-26	14/10/2014 14/10/2014	LCS-3	15/10/2014
Date analysed	-	117545-26	14/10/2014 14/10/2014	LCS-3	15/10/2014
Arsenic	mg/kg	117545-26	5 6 RPD: 18	LCS-3	112%
Cadmium	mg/kg	117545-26	<0.4 <0.4	LCS-3	107%
Chromium	mg/kg	117545-26	14 16 RPD: 13	LCS-3	110%
Copper	mg/kg	117545-26	26 36 RPD: 32	LCS-3	111%
Lead	mg/kg	117545-26	12 12 RPD: 0	LCS-3	103%
Mercury	mg/kg	117545-26	<0.1 <0.1	LCS-3	92%
Nickel	mg/kg	117545-26	<1 <1	LCS-3	106%
Zinc	mg/kg	117545-26	3 3 RPD: 0	LCS-3	106%
Iron	mg/kg	117545-26	8200 8100 RPD: 1	LCS-3	109%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	117545-9	15/10/2014
Date analysed	-	[NT]	[NT]	117545-9	15/10/2014
Arsenic	mg/kg	[NT]	[NT]	117545-9	86%
Cadmium	mg/kg	[NT]	[NT]	117545-9	100%
Chromium	mg/kg	[NT]	[NT]	117545-9	102%
Copper	mg/kg	[NT]	[NT]	117545-9	107%
Lead	mg/kg	[NT]	[NT]	117545-9	93%
Mercury	mg/kg	[NT]	[NT]	117545-9	116%
Nickel	mg/kg	[NT]	[NT]	117545-9	96%
Zinc	mg/kg	[NT]	[NT]	117545-9	99%
Iron	mg/kg	[NT]	[NT]	117545-9	#

Report Comments:

METALS_S: # Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteriae has been exceeded for 117545-6 for Cr and Fe. Therefore a triplicate result has been issued as laboratory sample number 117545-35.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT	
PROJECT: NBH		☐ Non Standard TAT (List due date):	
PROJECT NUMBER: 30011256-014	LAB QUOTE NO.: 1454196	COC SEQUENCE NUMBER (Circle)	
PROJECT MANAGER: Chris Masters	CONTACT PH: 0413456085	COC ① 2 3 4 5 6 7	
SAMPLED BY: Penelope Ford		OF: ① 2 3 4 5 6 7	
DATE SAMPLED: 7-13/10/14	RECEIVED BY: Kevin	RECEIVED BY:	RECEIVED BY:
Email Reports to (will default to PM if blank): daniel.sanders@smec.com	DATE/TIME: 14/10/14 11:00am	DATE/TIME:	DATE/TIME:
Special Laboratory Instructions: Please provide Esdat format			

SAMPLE DETAILS				ANALYSIS REQUIRED										COMMENTS	
LAB ID	SAMPLE ID	DATE / TIME	SAMPLE MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NO. CONTAINERS										
1	BH01/0.2-0.3	10.10.14	S	250ml + bag	2	COWBIE 3									
2	BH02/0.2-0.3	9.10.14				✓									
3	BH03/0.2	7.10.14				✓									
4	BH04/0.2	8.10.14				✓									
5	BH05/0.2	7.10.14				✓									
6	BH06/0.2	9.10.14				✓									
7	BH07/0.2-0.3	10.10.14				✓									
8	BH08/0.2-0.3	13.10.14				✓									
9	BH09/0.2-0.3	13.10.14				✓									
10	QC11	9.10.14				✓									
11	QC12	8.10.14				✓									
TOTAL															

Envirolab Services
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9970 6200
 Job No: **117588**
 Date Received: **14/10/14**
 Time Received: **10:30**
 Received by: **Kevin**
 Temp: **Early Ambient**
 Cooling: **Ice/coolpack**
 Security: **Intact Broken/None**



Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney NSW 2060

ph: 02 9925 5555
Fax: 02 9925 5566

Attention: Penelope Ford, Daniel Saunders

Sample log in details:

Your reference:	30011256.014
Envirolab Reference:	117588
Date received:	14/10/14
Date results expected to be reported:	21/10/14

Samples received in appropriate condition for analysis:	YES
No. of samples provided	11 soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	10.9
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

If there is sufficient sample after testing, samples will be held for the following time frames from date of receipt of samples:
Water samples - 1 month
Soil and other solid samples - 2 months
Samples collected in canisters - 1 week. Canisters will then be cleaned.
All other samples are not retained after analysis
If you require samples to be retained for longer periods then retention fees will apply as per our pricelist.

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

117588

Client:

SMEC Australia
Level 5, 20 Berry St
North Sydney
NSW 2060

Attention: Penelope Ford, Daniel Saunders

Sample log in details:

Your Reference:	30011256.014
No. of samples:	11 soils
Date samples received / completed instructions received	14/10/14 / 14/10/14

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:	21/10/14 / 17/10/14
Date of Preliminary Report:	Not Issued

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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	UNITS	117588-1	117588-2	117588-3	117588-4	117588-7
Our Reference:	-----	BH01	BH02	BH03	BH04	BH07
Your Reference	-----	0.2-0.3	0.2-0.3	0.2	0.2	0.2-0.3
Depth		10/10/2014	9/10/2014	07/10/2014	08/10/2014	10/10/2014
Date Sampled		Soil	Soil	Soil	Soil	Soil
Type of sample						
Date extracted	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Date analysed	-	17/10/2014	17/10/2014	17/10/2014	17/10/2014	17/10/2014
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	98	98	98	98

vTRH(C6-C10)/BTEXN in Soil	UNITS	117588-10
Our Reference:	-----	QC11
Your Reference	-----	-
Depth		09/10/2014
Date Sampled		Soil
Type of sample		
Date extracted	-	15/10/2014
Date analysed	-	17/10/2014
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	104

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117588-1 BH01 0.2-0.3 10/10/2014 Soil	117588-2 BH02 0.2-0.3 9/10/2014 Soil	117588-3 BH03 0.2 07/10/2014 Soil	117588-4 BH04 0.2 08/10/2014 Soil	117588-7 BH07 0.2-0.3 10/10/2014 Soil
Date extracted	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	260
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	250
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	86	82	85	86	84

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117588-10 QC11 - 09/10/2014 Soil
Date extracted	-	15/10/2014
Date analysed	-	16/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Surrogate o-Terphenyl	%	85

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	117588-1 BH01 0.2-0.3 10/10/2014 Soil	117588-2 BH02 0.2-0.3 9/10/2014 Soil	117588-3 BH03 0.2 07/10/2014 Soil	117588-4 BH04 0.2 08/10/2014 Soil	117588-7 BH07 0.2-0.3 10/10/2014 Soil
Date extracted	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	81	76	84	83	82

PAHs in Soil		
Our Reference:	UNITS	117588-10
Your Reference	-----	QC11
Depth	-----	-
Date Sampled		09/10/2014
Type of sample		Soil
Date extracted	-	15/10/2014
Date analysed	-	16/10/2014
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ NEPM B1	mg/kg	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	79

Acid Extractable metals in soil						
Our Reference:	UNITS	117588-1	117588-2	117588-3	117588-4	117588-7
Your Reference	-----	BH01	BH02	BH03	BH04	BH07
Depth	-----	0.2-0.3	0.2-0.3	0.2	0.2	0.2-0.3
Date Sampled		10/10/2014	9/10/2014	07/10/2014	08/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Date analysed	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Arsenic	mg/kg	<4	<4	<4	<4	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	12	13	12	25
Copper	mg/kg	14	12	9	8	1
Lead	mg/kg	17	13	13	16	23
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	1	2	2	3
Zinc	mg/kg	11	7	5	9	5
Iron	mg/kg	5,000	2,900	4,700	4,300	34,000

Acid Extractable metals in soil		
Our Reference:	UNITS	117588-10
Your Reference	-----	QC11
Depth	-----	-
Date Sampled		09/10/2014
Type of sample		Soil
Date digested	-	15/10/2014
Date analysed	-	15/10/2014
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	13
Copper	mg/kg	14
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	1
Zinc	mg/kg	8
Iron	mg/kg	3,700

Moisture						
Our Reference:	UNITS	117588-1	117588-2	117588-3	117588-4	117588-7
Your Reference	-----	BH01	BH02	BH03	BH04	BH07
Depth	-----	0.2-0.3	0.2-0.3	0.2	0.2	0.2-0.3
Date Sampled		10/10/2014	9/10/2014	07/10/2014	08/10/2014	10/10/2014
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/10/2014	15/10/2014	15/10/2014	15/10/2014	15/10/2014
Date analysed	-	16/10/2014	16/10/2014	16/10/2014	16/10/2014	16/10/2014
Moisture	%	22	20	22	21	20

Moisture		
Our Reference:	UNITS	117588-10
Your Reference	-----	QC11
Depth	-----	-
Date Sampled		09/10/2014
Type of sample		Soil
Date prepared	-	15/10/2014
Date analysed	-	16/10/2014
Moisture	%	20

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)-BTEX 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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
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	-			15/10/2014	[NT]	[NT]	LCS-8	15/10/2014
Date analysed	-			16/10/2014	[NT]	[NT]	LCS-8	16/10/2014
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-8	111%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-8	111%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-8	96%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-8	110%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-8	114%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-8	118%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-8	113%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	[NT]	[NT]	LCS-8	99%
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	-			15/10/2014	117588-7	15/10/2014 16/10/2014	LCS-8	15/10/2014
Date analysed	-			15/10/2014	117588-7	16/10/2014 17/10/2014	LCS-8	15/10/2014
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	117588-7	<50 <50	LCS-8	102%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	117588-7	<100 <100	LCS-8	116%
TRHC ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	117588-7	260 290 RPD: 11	LCS-8	107%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	117588-7	<50 <50	LCS-8	102%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	117588-7	250 280 RPD: 11	LCS-8	116%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	117588-7	<100 <100	LCS-8	107%
Surrogate o-Terphenyl	%		Org-003	84	117588-7	84 84 RPD: 0	LCS-8	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			15/10/2014	[NT]	[NT]	LCS-8	15/10/2014
Date analysed	-			16/10/2014	[NT]	[NT]	LCS-8	16/10/2014
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	80%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	80%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	81%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	78%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	80%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-8	77%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-8	89%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	84	[NT]	[NT]	LCS-8	82%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			15/10/2014	[NT]	[NT]	LCS-S3	15/10/2014
Date analysed	-			15/10/2014	[NT]	[NT]	LCS-S3	15/10/2014
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-S3	103%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-S3	96%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	99%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	103%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	96%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-S3	93%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	98%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	98%
Iron	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-S3	109%

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

NA: Test not required

<: Less than

PQL: Practical Quantitation Limit

RPD: Relative Percent Difference

>: Greater than

NT: Not tested

NA: Test not required

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.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.



SMEC

CHAIN OF CUSTODY FORM

SMEC OFFICE: North Sydney		TURNAROUND REQUIREMENTS: ☒ Standard - 5 day TAT		LAB: ALS	
PROJECT: NDH		☐ Non Standard TAT (List due date):		ATTENTION:	
PROJECT NUMBER: 30011256.014		LAB QUOTE NO.:		DISPATCH TO (ADDRESS & PHONE NO.):	
PROJECT MANAGER: Chris Mathers		CONTACT PH: 0413456085		277-289 Woodpark Rd	
SAMPLED BY: penelope.ford@smec.com		COC SEQUENCE NUMBER (Circle)		Smithfield NSW 2164	
DATE SAMPLED: 9.10.14		COC: ① 2 3 4 5 6 7			
Email Reports to (will default to PM if blank):		OF: ① 2 3 4 5 6 7			
Email Invoice to (will default to PM if blank):		RECEIVED BY:		RECEIVED BY: Sean	
Special Laboratory Instructions: Please fwd to ALS. Thanks.		DATE/TIME: 9.10.14		DATE/TIME: 10/10/14 12.00	
		RELINQUISHED BY: [Signature]		DATE/TIME: 10/10/14 15.00	

[illegible]

Notes: Low reporting limits required for groundwater as specified by SMEC Australia Pty Ltd.

Copies: WHITE: send to lab, YELLOW: to be placed in project file, PINK: to be retained in CoC book

ALS GROUP - Sydney
ES1440801



Telephone : +61-2-8784 8555

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : ES1440801

Client : **SMEC AUSTRALIA PTY LTD**
 Contact : CHRIS MASTERS
 Address : LEVEL 5, 20 BERRY STREET P O BOX
 1052
 NORTH SYDNEY NSW, AUSTRALIA
 2060

Laboratory : Environmental Division Sydney
 Contact :
 Address : 277-289 Woodpark Road Smithfield
 NSW Australia 2164

E-mail : chris.master@smec.com
 Telephone : +61 02 9925 5555
 Facsimile : +61 02 9925 5566

E-mail :
 Telephone : +61-2-8784 8555
 Facsimile : +61-2-8784 8500

Project : NDH 30011256.014
 Order number : ----
 C-O-C number : 1541

Page : 1 of 2
 Quote number : ----
 QC Level : NEPM 2013 Schedule B(3) and ALS
 QCS3 requirement

Site : ----
 Sampler : PENELOPE FORD

Dates

Date Samples Received : 10-Oct-2014
 Client Requested Due : 20-Oct-2014
 Date

Issue Date : 13-Oct-2014
 Scheduled Reporting Date : **20-Oct-2014**

Delivery Details

Mode of Delivery : Carrier
 No. of coolers/boxes : 1
 Receipt Detail :

Security Seal : Not Available
 Temperature : 10.8°C
 No. of samples received / analysed : 1 / 1

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
- 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(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**



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.

Matrix: SOIL

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1440801-001	[09-Oct-2014]	QC8	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

CHRIS MASTERS

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

PENELOPE FORD

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

CERTIFICATE OF ANALYSIS

Work Order	: ES1440801	Page	: 1 of 4
Client	: SMEC AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: CHRIS MASTERS	Contact	:
Address	: LEVEL 5, 20 BERRY STREET P O BOX 1052 NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: chris.master@smec.com	E-mail	:
Telephone	: +61 02 9925 5555	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9925 5566	Facsimile	: +61-2-8784 8500
Project	: NDH 30011256.014	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 10-Oct-2014 15:50
C-O-C number	: 1541	Date Analysis Commenced	: 13-Oct-2014
Sampler	: PENELOPE FORD	Issue Date	: 20-Oct-2014 19:14
Site	: ----		
Quote number	: ----	No. of samples received	: 1
		No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics



General Comments

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

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

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

Ø = ALS is not NATA accredited for these tests.

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC8	----	----	----	----
Client sampling date / time					[09-Oct-2014]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1440801-001	-----	-----	-----	-----
				Result	Result	Result	Result	Result	Result
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1	%		16.1	----	----	----	----
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		12	----	----	----	----
Copper	7440-50-8	5	mg/kg		8	----	----	----	----
Lead	7439-92-1	5	mg/kg		37	----	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg		20	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		0.6	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		1.2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC8	----	----	----	----
Client sampling date / time					[09-Oct-2014]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1440801-001	-----	-----	-----	-----
				Result	Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----	----
^ 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	130	----	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	130	----	----	----	----	----
^ >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	----	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%	89.8	----	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	95.1	----	----	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%	58.1	----	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%	108	----	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	103	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	112	----	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%	73.6	----	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	88.3	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	87.6	----	----	----	----	----

QA/QC Compliance Assessment for DQO Reporting

Work Order	: ES1440801	Page	: 1 of 4
Client	: SMEC AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: CHRIS MASTERS	Telephone	: +61-2-8784 8555
Project	: NDH 30011256.014	Date Samples Received	: 10-Oct-2014
Site	: ----	Issue Date	: 20-Oct-2014
Sampler	: PENELOPE FORD	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits for regular samples are based on control limits obtained from matrix spike data.

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103) QC8		09-Oct-2014	----	----	----	15-Oct-2014	23-Oct-2014	✓
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T) QC8		09-Oct-2014	15-Oct-2014	07-Apr-2015	✓	16-Oct-2014	07-Apr-2015	✓
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T) QC8		09-Oct-2014	15-Oct-2014	06-Nov-2014	✓	17-Oct-2014	06-Nov-2014	✓
EP080/071: Total Petroleum Hydrocarbons								
Soil Glass Jar - Unpreserved (EP071) QC8		09-Oct-2014	13-Oct-2014	23-Oct-2014	✓	14-Oct-2014	22-Nov-2014	✓
EP075(SIM)T: PAH Surrogates								
Soil Glass Jar - Unpreserved (EP075(SIM)) QC8		09-Oct-2014	13-Oct-2014	23-Oct-2014	✓	14-Oct-2014	22-Nov-2014	✓
EP080S: TPH(V)/BTEX Surrogates								
Soil Glass Jar - Unpreserved (EP080) QC8		09-Oct-2014	13-Oct-2014	23-Oct-2014	✓	13-Oct-2014	23-Oct-2014	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	11	18.18	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	17	11.76	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	15	13.33	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.88	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.88	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	11	9.09	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	17	5.88	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	5.00	5.00	✓	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)
TRH - 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 - C40.
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)
TRH 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.
Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

CERTIFICATE OF ANALYSIS

Work Order	: ES1440408	Page	: 1 of 4
Amendment	: 1		
Client	: SMEC AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: CHRIS MASTERS	Contact	:
Address	: LEVEL 5, 20 BERRY STREET P O BOX 1052 NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: chris.master@smec.com	E-mail	:
Telephone	: +61 02 9925 5555	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9925 5566	Facsimile	: +61-2-8784 8500
Project	: 30011256.014-NBH	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 07-Oct-2014 16:40
C-O-C number	: 1538	Date Analysis Commenced	: 10-Oct-2014
Sampler	: PENELOPE FORD	Issue Date	: 21-Oct-2014 09:34
Site	: ----		
Quote number	: ----	No. of samples received	: 3
		No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results



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>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics



General Comments

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

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

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

Ø = ALS is not NATA accredited for these tests.

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.**



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC2	QC6	----	----	----
Client sampling date / time					[02-Oct-2014]	[03-Oct-2014]	----	----	----
Compound	CAS Number	LOR	Unit		ES1440408-001	ES1440408-003	-----	-----	-----
					Result	Result	Result	Result	Result
EA055: Moisture Content									
^ Moisture Content (dried @ 103°C)	----	1	%		15.9	33.8	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		12	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		19	10	----	----	----
Copper	7440-50-8	5	mg/kg		<5	8	----	----	----
Lead	7439-92-1	5	mg/kg		17	28	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	<2	----	----	----
Zinc	7440-66-6	5	mg/kg		<5	14	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Benzo(b+j)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 (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	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QC2	QC6	----	----	----
Client sampling date / time					[02-Oct-2014]	[03-Oct-2014]	----	----	----
Compound	CAS Number	LOR	Unit		ES1440408-001	ES1440408-003	-----	-----	-----
					Result	Result	Result	Result	Result
EP080/071: Total Petroleum Hydrocarbons - Continued									
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>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	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		106	104	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		101	99.1	----	----	----
2,4,6-Tribromophenol	118-79-6	0.5	%		85.3	94.6	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		99.2	98.5	----	----	----
Anthracene-d10	1719-06-8	0.5	%		106	104	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		99.6	98.2	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		92.4	95.4	----	----	----
Toluene-D8	2037-26-5	0.2	%		96.5	90.4	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		99.3	91.4	----	----	----

QUALITY CONTROL REPORT

Work Order	: ES1440408	Page	: 1 of 8
Amendment	: 1		
Client	: SMEC AUSTRALIA PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: CHRIS MASTERS	Contact	:
Address	: LEVEL 5, 20 BERRY STREET P O BOX 1052 NORTH SYDNEY NSW, AUSTRALIA 2060	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: chris.master@smec.com	E-mail	:
Telephone	: +61 02 9925 5555	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 9925 5566	Facsimile	: +61-2-8784 8500
Project	: 30011256.014-NBH	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 07-Oct-2014
C-O-C number	: 1538	Date Analysis Commenced	: 10-Oct-2014
Sampler	: PENELOPE FORD	Issue Date	: 21-Oct-2014
Site	: ----	No. of samples received	: 3
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics



General Comments

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

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

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

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



Laboratory Duplicate (DUP) Report

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

Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA055: Moisture Content (QC Lot: 22772)									
ES1440394-005	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	21.2	18.2	15.3	0% - 20%
ES1440414-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	<1.0	<1.0	0.00	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 25308)									
EB1443752-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	4	4	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	9	16.5	No Limit
ES1440602-002	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	6	5	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	28	15.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 25309)									
EB1443752-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1440602-002	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 22737)									
ES1440408-001	QC2	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1,2,3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 22737) - continued									
ES1440408-001	QC2	EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1440438-009	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 22738)									
ES1440408-001	QC2	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1440438-009	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 23035)									
ES1440312-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1440339-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 22738)									
ES1440408-001	QC2	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit
ES1440438-009	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.00	No Limit



Sub-Matrix: SOIL				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 23035)									
ES1440312-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1440339-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 23035)									
ES1440312-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1440339-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit



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				
EG005T: Total Metals by ICP-AES (QCLot: 25308)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	103	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.6	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	96.5	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	106	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.7	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	104	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	5	60.8 mg/kg	110	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 25309)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	84.6	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 22737)								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	110	79	123
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	110	77	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	107	79	123
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	104	73	121
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	106	76	122
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	4 mg/kg	99.4	70	118
EP075(SIM): Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	102	72	114
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	107	77	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	110	81	123
EP075(SIM): Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	112	72	113
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	110	77	123
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	109	71	113
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	107	80	124
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	112	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	113	79	125
EP080/071: Total Petroleum Hydrocarbons (QCLot: 22738)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	100	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	250 mg/kg	103	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	98.0	64	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 23035)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	99.5	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 22738)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	103	70	130



Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 22738) - continued								
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	200 mg/kg	82.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 23035)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080: BTEXN (QCLot: 23035)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	96.6	62	116
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	93.7	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.9	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	92.2	62	138
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	97.9	60	120
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	92.6	62	128

Matrix Spike (MS) Report

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

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 25308)							
EB1443752-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	105	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	109	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	105	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	106	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	102	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 25309)							
EB1443752-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	97.7	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 22737)							
ES1440408-001	QC2	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	111	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	118	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 22738)							
ES1440408-001	QC2	EP071: C10 - C14 Fraction	----	560 mg/kg	87.8	73	137
		EP071: C15 - C28 Fraction	----	2370 mg/kg	90.6	53	131
		EP071: C29 - C36 Fraction	----	1695 mg/kg	104	52	132



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: 23035)							
ES1440312-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	122	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 22738)							
ES1440408-001	QC2	EP071: >C10 - C16 Fraction	>C10_C16	902 mg/kg	82.1	73	137
		EP071: >C16 - C34 Fraction	----	3190 mg/kg	95.1	53	131
		EP071: >C34 - C40 Fraction	----	1087 mg/kg	112	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 23035)							
ES1440312-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	122	70	130
EP080: BTEXN (QCLot: 23035)							
ES1440312-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	95.1	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	94.8	70	130
		EP080: meta- & para-Xylene	108-38-3	2.5 mg/kg	93.4	70	130
			106-42-3				
		EP080: Naphthalene	91-20-3	2.5 mg/kg	74.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	96.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.5	70	130

QA/QC Compliance Assessment for DQO Reporting

Work Order : **ES1440408**

Page : 1 of 4

Amendment : **1**

Client : **SMEC AUSTRALIA PTY LTD**

Laboratory : Environmental Division Sydney

Contact : CHRIS MASTERS

Telephone : +61-2-8784 8555

Project : 30011256.014-NBH

Date Samples Received : 07-Oct-2014

Site : ----

Issue Date : 21-Oct-2014

Sampler : PENELOPE FORD

No. of samples received : 3

Order number : ----

No. of samples analysed : 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits for regular samples are based on control limits obtained from matrix spike data.

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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



Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103) QC2	02-Oct-2014	----	----	----	10-Oct-2014	16-Oct-2014	✓
Soil Glass Jar - Unpreserved (EA055-103) QC6	03-Oct-2014	----	----	----	10-Oct-2014	17-Oct-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC2	02-Oct-2014	15-Oct-2014	31-Mar-2015	✓	15-Oct-2014	31-Mar-2015	✓
Soil Glass Jar - Unpreserved (EG005T) QC6	03-Oct-2014	15-Oct-2014	01-Apr-2015	✓	15-Oct-2014	01-Apr-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC2	02-Oct-2014	15-Oct-2014	30-Oct-2014	✓	16-Oct-2014	30-Oct-2014	✓
Soil Glass Jar - Unpreserved (EG035T) QC6	03-Oct-2014	15-Oct-2014	31-Oct-2014	✓	16-Oct-2014	31-Oct-2014	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) QC2	02-Oct-2014	10-Oct-2014	16-Oct-2014	✓	11-Oct-2014	19-Nov-2014	✓
Soil Glass Jar - Unpreserved (EP071) QC6	03-Oct-2014	10-Oct-2014	17-Oct-2014	✓	11-Oct-2014	19-Nov-2014	✓
EP075(SIM)T: PAH Surrogates							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC2	02-Oct-2014	10-Oct-2014	16-Oct-2014	✓	11-Oct-2014	19-Nov-2014	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) QC6	03-Oct-2014	10-Oct-2014	17-Oct-2014	✓	11-Oct-2014	19-Nov-2014	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QC2	02-Oct-2014	10-Oct-2014	16-Oct-2014	✓	10-Oct-2014	16-Oct-2014	✓
Soil Glass Jar - Unpreserved (EP080) QC6	03-Oct-2014	10-Oct-2014	17-Oct-2014	✓	10-Oct-2014	17-Oct-2014	✓



Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	16	12.50	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	15	13.33	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	20	10.00	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	18	11.11	10.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	16	6.25	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	15	6.67	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	5.00	5.00	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	18	5.56	5.00	✓	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)
TRH - 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 - C40.
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)
TRH 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.
Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

APPENDIX F

SITE PHOTOGRAPHS

Site Photographs – 30011256 – NBH site Warringah Road Frenchs Forest, NSW



Photo 1 – Testpit TP33A – grey clay soil profile



Photo 2 – Fragments of ACM at TP15



Photo 3 – Old concrete slab evident in vicinity of TP15



Photo 4 – ACM on ground in vicinity of TP13



Photo 5 – Testpit TP19 – orange brown clay beneath grey brown A horizon



Photo 6 – TP29A – bricks and topsoil encountered in former garden. Photo looking southeast towards site office and Warringah Road

Site Photographs – 30011256 – NBH site Warringah Road Frenchs Forest, NSW



Photo 7 – ACM encountered in vicinity of TP56. Asbestos section of the site cordoned off



Photo 8 – Former concrete slab at TP60. Photo looking southwest towards site office



Photo 9 – TP53 where rubbish in fill below a thin clay covering was encountered. Photo looking northeast towards heritage zone



Photo 10 – Scrap metal dumped on surface in vicinity of TP59A . A thick vine/ vegetation canopy formerly hid this from view.



Photo 11 – TP54. Photo looking west towards former residential blocks.



Photo 12 – Rubbish in fill (including ACM) encountered to 0.6m bgl in TP53

Site Photographs – 30011256 – NBH site Warringah Road Frenchs Forest, NSW



Photo 13 – Spoil excavated from TP62 showing C&D waste



Photo 14 – Rubble fill layer in TP62 to 1.0m bgl



Photo 15 – Spoil excavated from TP61 showing C&D waste



Photo 16 – Rubble fill layer in TP61 to 1.0m bgl

Site Photographs – 30011256 – NBH site Warringah Road Frenchs Forest, NSW



Photo 17 – TP47 – Looking south towards Warringah Road



Photo 18 – TP44 – The open service trench along the southern site boundary was utilised for sampling at this location

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