Appendix F

Dangerous Good Search

OFFICE OF REGULATORY SERVICES
DEPARTMENT OF JUSTICE & COMMUNITY SAFETY

22 September 2014

AECOM Australia Pty Ltd
PO Box 1942
CANBERRA CITY ACT 2601

Attention: [redacted]

Thank you for the application for a records search for Block 6 Section 97 Charnwood ACT.

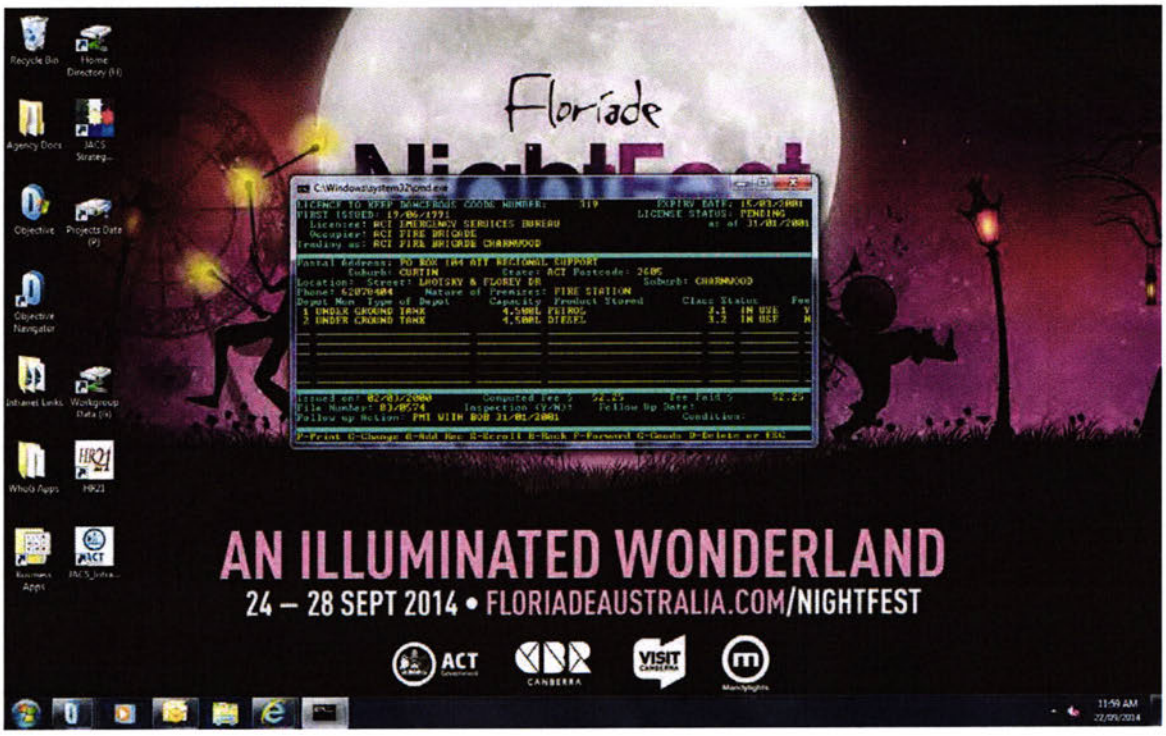
I have conducted a search of the Dangerous Substances Register and hold no records, however a search of the Dangerous Goods database held records and have emailed a screen shot of the data, the file in no longer available.

(Please note: Under the *Dangerous Goods Act 1975* (1975 to April 2004), tanks of 50,000 litres which contained Diesel were not required to be licenced with WorkCover, only if the capacity was 50,001 litres).

If you have any questions in relation to this matter please do not hesitate in contacting me on 62076353 or email lisa.curran@act.gov.au.

Regards

Lisa Curran
Administration Officer
Dangerous Substances Licencing
WorkSafe ACT



Licence to Keep 319

ACT Fire brigade Charnwood

AECOM

AECOM Australia Pty Ltd (2014c) *UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT*, issued 03 October 2014.

AECOM

Former West Belconnen Fire Station
Justice and Community Safety Directorate
18-Nov-2014
Doc No. 60316172-TankPullValidationReport-Charnwood-20141003_A

Commercial-in-Confidence

UPSS Validation Report

Former West Belconnen Fire Station, Belconnen, ACT

UPSS Validation Report

Former West Belconnen Fire Station, Belconnen, ACT

Client: Justice and Community Safety Directorate

ABN: 98 636 852 025

Prepared by

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Job No.: 60316172

AECOM in Australia and New Zealand is certified to the latest version of ISO9001, ISO14001, AS/NZS4801 and OHSAS18001.

Quality Information

Document UPSS Validation Report

Ref 60316172

Date 18-Nov-2014

Prepared by [redacted]

Reviewed by [redacted]

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Glossary of Terms

General Terms	
ACT EPA	Australian Capital Territory Environment Protection Authority
ACM	Asbestos containing material(s)
AEC	Areas of Environmental Concern
AFFF	Aqueous Film-Forming Foam
ANZECC	Australian and New Zealand Environment and Conservation Council
AHD	Australian Height Datum
AST	Above ground Storage Tank
BMRGG	Bureau of Mineral Resources, Geology and Geophysics
BTEX	Benzene, toluene, ethylbenzene and xylenes
COPC	Contaminants of potential concern
EMP	Environmental Management Plan
ESA	Environmental Site Assessment
ESDD	Environment and Sustainable Development Directorate
Heavy metals	Generally arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc
JACS	The Justice & Community Safety Directorate
NEHF	National Environmental Health Forum
NEPC	National Environment Protect Council
NEPM	National Environmental Protection Measure
NSW EPA	New South Wales Environment Protection Authority
OCP	Organochlorine pesticides
OPP	Organophosphorus pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated biphenyls
PFOS	Perfluorooctane Sulfonate
POP	Persistent Organic Pollutant
SMP	Soil or Site Management Plan
SWL	Standing Water level
TPH	Total petroleum hydrocarbons
UST	Underground Storage Tank

Units				
ha	hectare		µg/kg	micrograms/kilogram
km	kilometre		µg/L	micrograms/litre
m	metre		ppb	parts per billion
mg/kg	milligrams/kilogram		ppm	parts per million
mg/L	milligrams/litre		t	Tonne

Executive Summary

AECOM Australia Pty Ltd (AECOM) was engaged by Justice and Community Safety Directorate (JACSD) to prepare this report documenting the removal of the underground petroleum storage system (UPSS) and validate the suitability of the associated excavations located at the former West Belconnen Fire Station (the Site).

The Site is identified as Block 6, Section 97, Charnwood, ACT. The Site location is shown on **Figure 1** (**Appendix A**) and the current Site layout and known locations of the UPSS is shown on **Figure 2** (**Appendix A**). The Site is presently zoned as TSZ2 – Services. AECOM understands that the Territory is proposing to submit a Territory Plan Variation to change the land use to Community Facility Zone (CFZ) with potential for a childcare centre.

The UPSS removal works were completed by Enviropacific Services Pty Ltd (EPS) and the validation works were completed by AECOM. Both the UPSS removal and validation works were undertaken in accordance with a Development Application (DA) number 201425825, approved18 July 2014.

The objectives of the works were to remove UPSS infrastructure and validate the former UPSS excavation. It should be noted that only soils from the base and walls of excavation, stockpiles and imported excavated natural material (ENM) were sampled during the UPSS validation works. The samples within this report validated the UPSS excavations only and not the wider Site.

To meet the objectives, the following scope of works was undertaken between AECOM and EPS for JACSD:

- Lodge a DA and obtain development approval for the Site.
- Prepare and adhere to a Site Specific Work Health and Safety Plan and Environmental Management Plan.
- Underground service locating by a Telstra accredited locator with reference to Dial Before You Dig (DBYD) plans.
- Removal of UPSS which included three USTs up to 4,500 L, two fuel dispenser pumps, three vent pipes and associated pipework.
- Collection of 18 soil validation samples (SP01 to SP18) from the excavations formed by UPSS removal plus two quality control / quality assurance (QAQC) samples (QC01 and QC02).
- Stockpiling of soils excavated during UPSS removal works into four separate stockpiles. Collection of 11 soil samples for characterisation of stockpiled material plus 2 QAQC samples (QC03 and QC04).
- Inspection and collection of soil samples (SOB01 to SOB04) from excavated natural material (ENM) at its source (Boral Quarry at Kaveneys Road, Hall, NSW).
- Backfilling of excavations with imported ENM soils.
- Laboratory analysis of selected soil samples for contaminants of potential concern (CoPC).
- Preparation of one Waste Classification Letters for all soils within the four stockpiles for off-Site disposal.

The results of the field activities can be summarised as follows:

- All UPSS tanks and associated infrastructure was removed and disposed off-site at a licensed waste disposal facility.
- Laboratory analysis of samples collected from the base and walls of three excavations reported concentrations of all CoPCs less than the laboratory LOR and/or adopted RAC, indicating that the UPSS excavations were appropriately validated.
- A total of 96 m^3 of excavated materials were classified and disposed off-site as solid waste (refer to AECOM, 2014b). It should be noted that concentrations of COPCs in samples collected from the stockpiles were below the laboratory LOR and/or adopted RAC, with the exception of TRH C_6-C_{10} less BTEX and TRH C_{10}-C_{16} less naphthalene.
- A total of 32 t of suitable ENM was imported to the Site following an inspection of the material and analysis of samples collected, which reported concentrations of all COPCs below the laboratory LOR and/or adopted RAC.

AECOM considers that validation of the UPSS excavation was completed to a standard acceptable for the proposed future land use i.e. Community Facility Zone (CFZ) with potential for a childcare centre.

1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) was engaged by Justice and Community Safety Directorate (JACSD) to prepare this report documenting the removal of the underground petroleum storage system (UPSS) and validate the suitability of the associated excavations located at the former West Belconnen Fire Station (the Site).

The Site is identified as Block 6, Section 97, Charnwood, ACT. The Site location is shown on **Figure 1** (**Appendix A**) and the current Site layout and known locations of the UPSS is shown on **Figure 2** (**Appendix A**). The Site is presently zoned as TSZ2 – Services. AECOM understands that the Territory is proposing to submit a Territory Plan Variation to change the land use to Community Facility Zone (CFZ) with potential for a childcare centre.

The UPSS removal works were completed by Enviropacific Services Pty Ltd (EPS) and the validation works were completed by AECOM. Both the UPSS removal and validation works were undertaken in accordance with a Development Application (DA) number 201425825, approved18 July 2014.

The works were carried out in general accordance with the Remedial Action Plan (RAP) (AECOM, 2014a) and included the removal of UPSS which comprised three underground storage tanks (USTs) and associated infrastructure followed by excavation validation. It should be noted that the works covered in this report relate only to the former UPSS and excavations. The report does not provide an assessment of the suitability of the whole Site.

1.2 Project Objectives

The objectives of the works were to:

- Remove UPSS infrastructure.
- Validate the former UPSS excavation in accordance with the RAP.

It should be noted that only soils from the base and walls of excavation, stockpiles and imported excavated natural material (ENM) were sampled during the UPSS validation works. The samples within this report validated the UPSS excavations only and not the wider Site.

1.3 Scope of Work

To meet the objectives, the following scope of works was undertaken between AECOM and EPS for JACSD:

- Lodge a DA and obtain development approval for the Site.
- Prepare and adhere to a Site Specific Work Health and Safety Plan and Environmental Management Plan.
- Underground service locating by a Telstra accredited locator with reference to Dial Before You Dig (DBYD) plans.
- Removal of UPSS which included three USTs (diesel 10,000 L, petrol 10,000 L and kerosene 4,500 L) two fuel dispenser pumps, three vent pipes and associated pipework.
- Collection of 18 soil validation samples (SP01 to SP18) from the excavations formed by UPSS removal plus two quality control / quality assurance (QAQC) samples (QC01 and QC02).
- Stockpiling of soils excavated during UPSS removal works into four separate stockpiles. Collection of 11 soil samples for characterisation of stockpiled material plus 2 QAQC samples (QC03 and QC04).
- Inspection and collection of soil samples (SOB01 to SOB04) from excavated natural material (ENM) at its source (Boral Quarry at Kaveneys Road, Hall, NSW).
- Backfilling of excavations with imported ENM soils.
- Laboratory analysis of selected soil samples for contaminants of potential concern (CoPC). the following compounds were considered to be Contaminants of Potential Concern (CoPC) for the validation works:
    - Total recoverable hydrocarbons (TRH).

- Benzene, toluene, ethylbenzene and xylenes (BTEX).
- Heavy metals.
- Polycyclic aromatic hydrocarbons (PAHs).
- Phenols.
- Asbestos.
- Organochlorine and Organophosphorous Pesticides (OCPs and OPPs).
- Polychlorinated Biphenyls (PCBs).
- Volatile Organic Compounds (VOCs).

- Preparation of one Waste Classification Letter for all soils within the four stockpiles for off-Site disposal.

1.4 Relevant Guidelines

The validation works were carried out in accordance with the following legislation and guidelines:

- Environmental Guidelines for Service Station Site and Hydrocarbon Storage (ACT EPA, 2014a).
- Contaminated Sites Environmental Protection Policy (ACT EPA, 2009) and the Addendum to the Contaminated Sites Environmental Protection Policy (ACT EPA, 2014b).
- Information Sheet Number 1 - Contaminated Sites - Decommissioning, Assessment and Audit of Sites Containing Above Ground or Underground Fuel Storage Tanks (ACT EPA, 2014c).
- Information Sheet Number 3 - Contaminated Sites - Requirements for the Assessment and Validation of Sites Containing Above Ground or Underground Fuel Storage Tanks in the ACT (ACT EPA, 2014d).
- Information Sheet Number 4 - Contaminated Sites - Requirements for Re-use and Disposal of Contaminated Soil (ACT EPA, 2014e).
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (ASC NEPM, 2013).
- CRC for Contamination Assessment and Remediation of the Environment (CRC CARE) - Technical Report No. 10, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater (Friebel & Nadebaum, 2011).
- United States Environment Protection Authority - Regional Screening Levels for Chemical Contaminants at Superfund Sites (US EPA, May 2014).
- Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2011).
- Guidelines for the NSW Site Auditor Scheme (2nd edition) (NSW EPA, 2006).

2.0 Background Information

2.1 Site Identification

The Site identification details are provided in **Table 1**.

Table 1 Site Identification Details

Item	Description
Property Identification	Former West Belconnen Fire Station
Property Address	Corner of Lhotsky Street and Florey Drive, Charnwood ACT
Title Identification Details	Block 6, Section 97, Charnwood
Property Area	The total Site area is approximately 3638 m²
Current Zoning	TSZ2 - Services
Site Owner	Owned by ACT Government, managed by Justice and Community Safety Directorate
Property Location	**Figure 1** (**Appendix A**)
Property & Site Layout	**Figure 2** (**Appendix A**)

2.2 Surrounding Land Uses

The land uses surrounding the Site at the time of investigation are presented in **Table 2**.

Table 2 Surrounding Land Uses

Direction from Site	Land Use
North	Open Space.
East	St Thomas Aquinas Primary School, Early Learning Centre and Catholic Church.
South	Ginninderra Christian Church.
West	Charnwood District Playing Fields.

2.3 Current Land Use and Site Features

The Site was previously used as a fire station for the ACT Emergency Services Agency – ACT Fire and Rescue and it is currently disused. Prior to the UPSS validation works, the following key features on-site were:

- Three USTs (Tank 1 diesel 10,000 L, Tank 2 petrol 10,000 L and Tank 3 kerosene 4,500 L), two bowsers, three vent pipes and associated pipework (removed during UPSS validation works).

Other existing features include:

- Main building and garage centrally located with a drive leading to Lhotsky Street.
- Large bitumen covered space located directly to the south of the main building and extending to the southern boundary.
- Gates (located by the eastern boundary of the Site) leads into the rear courtyard of the station.
- The Site is capped with bitumen and small garden areas.

2.4 Topography and Drainage

The Site and surrounding area is generally flat with a slight slope to the south. During an inspection of the Site no visible surface water was present within the Site boundary; however it is expected that surface water when present during periods of rainfall would generally flow to the Site boundaries and captured by on-site and adjacent stormwater infrastructure.

2.5 Geology and Soils

Review of available mapping indicates that the site is underlain by material of middle-late Silurian age (Bureau of Mineral Resources, Geology and Geophysics 1984). This material consists of rhyodacite ignimbrite and minor volcanoclastic and argillaceous sediments.

During the works, soils were observed as comprising light to dark brown, low plasticity, dry silty clays with traces of minor to coarse, sub-angular ironstone gravels.

2.6 Hydrogeology

Review of available mapping indicates that the site is underlain by two water bearing zones of middle-late Silurian age (Bureau of Mineral Resources, Geology and Geophysics 1984).

Both of the hydrogeological units are noted to be fractured with higher yielding zones associated the upper and lower portions of the individual ash-flow tuffs and interbedded sediments. The water quality is variable to poor with yields expected to be 0.5 to 1.0 L/s with total dissolved solids of 500 to 1000 mg/L.

Groundwater was not encountered during the excavation works.

2.7 Previous Environmental Investigations

2.7.1 AECOM Australia Pty Ltd (2014) Remediation Action Plan, Former West Belconnen Fire Station, issued 03 March 2014.

The RAP was compiled to provide the remedial strategy detailing the excavation, soil stockpiling, transport, validation and occupational health and safety and environmental management strategies associated with the remediation works for the partial validation area of the West Belconnen Fire Station.

The RAP recommended the following works be undertaken with regard to UPSS infrastructure at the Site.

- Decommissioning and removal of three USTs.
- Decommissioning and removal of two fuel dispensers and associated pipework.
- Decommissioning and removal of three vent pipes.
- Characterisation and re-use or off-site disposal of impacted soils.

AECOM considers that if the remediation and management works proposed within the RAP are successfully undertaken, the on-site UPSS and potentially contaminated soils will be removed and validated in accordance with ACT EPA requirements.

It should be noted that these works do not provide an overall assessment of the Suitability of the site and only relate to the onsite fuel storage and dispensing area.

3.0 Fieldwork Program

A summary of the field activities undertaken at the Site for the UPSS validation works are detailed in **Table 3**.

Table 3 Fieldwork Program

Date	Fieldwork Activity	Samples Analysed	Comments
25 - 26 August 2014	EPS removed the fill and natural material surrounding Tank 1, Tank 2 and Tank 3 forming corresponding Stockpile 1, Stockpile 2 and Stockpile 3. The final stockpile, Stockpile 4, comprises topsoil.	n/a	All tank sands and fill materials associated with original construction of UPSS were removed in order to expose natural soils on walls and base of each excavation. Purge and disposal dockets in **Appendix D**.
27 August 2014	AECOM inspect the works to validate excavation extent, characterise stockpiles and address compliance with environmental protection measures on the Site (i.e. sediment control, stockpiles covered)	Validation samples S1 to S18 taken from the excavation. Characterisation samples SP1 to SP11 of stockpiles.	Sample locations shown within **Figure 3** (**Appendix A**). The sample register is presented as **Table T2** (**Appendix B**). Excavation Photographs shown in **Appendix G**.
04 September 2014	AECOM inspect 100 m^3 of ENM stockpiles at Boral Quarry, Kaveneys Road, Hall, NSW that EPS proposed for import to Site for use as backfill.	Characterisation samples SOB01, SOB02, SOB03 and SOB04 taken on a 1 per 25m^3 rate.	ENM at Boral Quarry classified as suitable for the proposed future land use low density residential with childcare. The sample register is presented as **Table T2** (**Appendix B**).
10 September 2014	AECOM issue Waste Classification Letter to JACSD to accompany all stockpiled material proposed for disposal off-Site.	Characterisation samples SP1 to SP11 of stockpiles used in classification letter.	Stockpiles classified as *Solid Waste* under ACT Waste Guidelines, see **Appendix H**. The sample register is presented as **Table T2** (**Appendix B**).
10 September 2014	EPS remove all stockpiles from Site for disposal at Veolia ES – Woodlawn Landfill, Collector Road, Tarago, NSW.	A total of 70.06 t of material transported to Woodlawn Landfill.	Disposal documentation provided within **Appendix D**.
25 September 2014	EPS import 32 t of ENM from Boral Quarry to backfill the excavations. AECOM confirm compliance with ENM characterised on 4 September 2014.	n/a	ENM filled and compacted in 300 mm layers in excavations. Site swept and tidied by EPS. Import documentation of ENM in **Appendix D**.

3.1 Soil Assessment Methodology

The fieldwork methodology for AECOM activities only (collection of soil samples for laboratory analysis) is summarised in **Table 4** below.

All soil samples were collected directly from the excavator bucket and/or trowel by gloved hand and placed into laboratory prepared 125 mL soil jars with minimal headspace to reduce the potential for volatile loss. The samples

were then placed into an insulated container containing crushed ice and transported to the laboratory under chain of custody (COC) documentation.

Table 4 Soil Sampling Methodology

Activity	Details
UST Soil Sampling	Following the removal of each UST, the backfill materials and natural soils were excavated and stockpiled separately for characterisation. The number and location of soil samples collected from the excavations were in accordance with ACT EPU (2011) Environmental Guidelines for Service Station Sites and Hydrocarbon Storage and NSW EPA (1994) Guidelines for Assessing Service Station Sites. For a single tank excavation, the minimum number of soil validation samples was one from the base and one from each wall of the pit. For multiple USTs in a single excavation, the number of soil validation samples is increased to a sample density of generally 1 sample per 25m^2 for both the walls and base of the excavation.
Stockpile Soil Sampling	Materials excavated during the UST and pipework removal were stockpiled separately. The excavator was used to dig approximately 0.5 to 1 m into the stockpiles to collect each sample at a rate of 1 sample per 25 m^3. The trowel was decontaminated using a phosphate free detergent (Decon 90) between sample collection events.
Soil Logging	Soil logging was generally in accordance with the Unified Soil Classification System (USCS) and the AECOM documented standard field procedures.
Field Screening for Volatile Organic Compounds (VOCs)	Soil sub-samples were collected from each sample collection location and were placed in snap-lock plastic bag and the headspace in the bag was screened for VOC using a calibrated photo-ionisation detector (PID) equipped with a 10.6 eV lamp. The PID readings were recorded on the sample register in **Table T2** in **Appendix B**. Calibration records are provided within **Appendix E**.
Decontamination	A new pair of disposable gloves was used to collect each soil sample. It was deemed unnecessary to collect rinsate samples during excavation sampling as non-disposable equipment was not utilised during the works. Furthermore, soil samples were collected from the relatively undisturbed soil materials contained within the bucket rather than soils that had been in contact with the bucket edges. Decontamination of the hand trowel during stockpile soil sampling was undertaken using a phosphate free detergent (Decon 90) solution followed by a double rinse with de-ionised water.
Field QA/QC Samples	The following quality assurance and quality control samples were collected during the sampling program: - Intra-laboratory duplicates at a rate of 1 per 20 primary samples. - Inter-laboratory duplicates at a rate of 1 per 20 primary samples. - Rinsate blank at a rate of 1 per day of soil sampling. - Trip blank at a rate of 1 per batch. These are further detailed and discussed in **Appendix C**.

3.2 Data Usability

A review of the laboratory QA/QC data completed by AECOM is presented in **Appendix C**. This indicated that the results met the acceptance criteria for the analyses conducted.

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

4.0 Validation Acceptance Criteria

4.1 Conceptual Site Model

A CSM is a site-specific qualitative description of the source(s) of contamination, the pathway(s) by which contaminants may migrate through the environmental media, and the populations (human or ecological) that may potentially be exposed. This relationship is commonly known as a Source-Pathway-Receptor (SPR) linkage. Where one or more elements of the SPR linkage are missing, the exposure pathway is considered to be incomplete and no further assessment is required.

The CSM for the Site has been prepared in accordance with Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) *Technical Report 23 Petroleum Hydrocarbon Vapour Intrusion Assessment: Australian Guidance*, Table 1 (CRC CARE, 2013).

4.1.1 Site Setting and Basis for Assessment Criteria

The Site is zoned within TSZ2 – Services. The Site and surrounding area is generally flat with a slight slope to the south. During an inspection of the Site no visible surface water was present within the Site boundary; however it is expected that surface water when present during periods of rainfall would generally flow to the Site boundaries and captured by on-site and surrounding stormwater infrastructure.

AECOM understands that the Territory is proposing to submit a Territory Plan Variation to change the land use to Community Facility Zone (CFZ) with potential for a childcare centre.

As the Site has minimal plant life, an assessment of potential on-site ecological risks is not considered applicable for these works.

It should be noted that only soils from the base and walls of excavation, stockpiles and imported ENM were sampled during the UPSS validation works. The samples within this report validated the UPSS excavations only and not the wider Site. The assessment criteria for soils are outlined in **Section 4.4** below.

4.2 Contaminant Sources and Contaminants of Potential Concern

The sources of contamination were considered to be the three USTs and associated UPSS infrastructure identified in **Section 2.3**. As such, the following compounds were considered to be Contaminants of Potential Concern (CoPC) for the validation works:

- TRH.
- BTEX.
- Heavy metals.
- PAHs.
- Phenols.
- Asbestos.
- OCPs and OPPs.
- PCBs.
- VOCs.

All sampling and analysis for the UPSS validation works were completed in accordance with the AECOM RAP (2014a).

4.3 Transport Mechanisms and Potential for Exposure

The potential transport mechanisms and exposure pathways developed only for the UPSS removal and validation works at the Site are presented in **Table 5** below.

Table 5 Transport Mechanisms and Potential for Exposure

Receptor	Exposure Pathway
On-site Commercial Worker	- Inhalation of soil-derived dust in indoor/outdoor air. - Inhalation of soil vapours in indoor/outdoor air. - Incidental ingestion and dermal contact with soils.
On-site Intrusive Maintenance Worker	- Inhalation of soil-derived dust in outdoor air. - Inhalation of soil-derived vapours in outdoor air and within a trench. - Incidental ingestion and dermal contact with soils.
Low Density Residential (with childcare centre)	- Inhalation of soil-derived dust in indoor air. - Inhalation of soil vapours in indoor air. - Incidental ingestion and dermal contact with soils.

4.4 Soils Acceptance Criteria

Potential sources were qualitatively identified in **Section 4.2**. The Tier 1 assessment aims to confirm whether these sources have the potential to be associated with unacceptable risks by comparison of reported CoPC concentrations in media of concern (i.e. soil) at the Site against conservative generic screening criteria, termed 'Tier 1' screening criteria which have been derived based on protection of human health. When the CoPC concentration is reported to be present in the environmental media at the Site above Tier 1 screening criteria, further assessment of the CoPC is required.

For vapour pathways, a CoPC was considered to be sufficiently volatile if its Henry's Law constant is greater than 1×10^{-5} atm-m^3/mol and the vapour pressure is greater than 1 mm Hg at room temperature (ASC NEPM, 2013: Schedule B2) with the exception of naphthalene which was considered sufficiently volatile.

Contaminants of concern (COC) in soil were selected based on comparison to appropriate screening criteria based on residential land use (low-density). In the first instance, only risks to on-site residential receptors will be assessed as it is considered to be sufficiently protective of on-site commercial workers and on-site intrusive maintenance workers.

4.4.1 Validation Samples, Stockpile Samples and Imported ENM Samples

The following hierarchy of soil screening criteria was adopted:

- ASC NEPM (2013): Schedule B1. Soil Health Investigation Levels (HILs) and Health Screening Levels (HSLs), specifically:
  - HIL A (low-density residential).
  - HSL A/B – Sand – 1 to <2 m (low/high density residential).
- Friebel & Nadebaum (2011) CRC CARE Health Screening Levels (HSLs) for Petroleum Hydrocarbons in Soil and Groundwater. Soil HSLs, specifically:
  - Direct Contact HSL A (low-density residential).
- US EPA (May, 2014) - Regional Screening Levels (RSLs) – Residential Soil (US EPA, 2014).

The soil screening criteria selection process is shown in **Table T3**, **Appendix B**.

Where (if any) asbestos was identified, the following screening criterion was adopted:

- The ASC NEPM 2013 Schedule B (1) Guideline on Investigation Levels for Soil and Groundwater.

AECOM notes that the asbestos criteria in the ASC NEPM 2013 are sourced from the Western Australia Department of Health (WA DoH) (2009) Guidelines for the Assessment, Remediation and Management of Asbestos – Contaminated Sites in Western Australia.

The ASC NEPM (2013) and WA (2009) guidelines make the following definitions in relation to asbestos materials:

- **Bonded ACM**: comprises asbestos containing material which is in sound condition, although possibly broken of fragments, and where the asbestos is bound in a matrix such as cement or resin. This definition also to material that cannot pass a 7 mm x 7 mm sieve;

- **Fibrous asbestos (FA)**: comprises friable asbestos and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded; and
- **Asbestos fines (AF)**: includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

The guidelines emphasises that the assessment and management of asbestos contamination should take into account the condition of the asbestos materials and the potential for damage and resulting release of asbestos fibres. The health screening levels are presented in **Table 6**.

Table 6 Health screening levels for asbestos contamination in soil

Land use	Asbestos Group	% w/w asbestos
Commercial/Industrial	ACM	0.05
All land uses	FA and AF[1]	0.001
All forms of asbestos	No visible or free fibre asbestos in surface soil	

Notes: w/w = weight for weight of asbestos in soil
Not applicable for free fibres.

4.4.2 Waste Classification

The current criteria used in the ACT to characterise waste materials for off-site disposal are provided in ACT EPA (2000), Waste Classification Guidelines.

Waste derived from the UPSS removal works was classified under the abovementioned guidelines. Refer to Waste Classification letter (AECOM, 2014b) presented as **Appendix H**.

5.0 Results

5.1 UST Removal Summary

The materials tracking register for the works is presented within **Table T1** in **Appendix B**, and photos of the USTs and excavations are presented within **Appendix G**. UST removal was conducted in August 2014 and conditions of the USTs are summarised below in **Table 7**.

Table 7 UST Removal Summary

Tank ID	Excavation	Excavation Dimensions	Condition / Comments
Tank 1	1	4.2 L x 2.2 W x 2.5 D	Base and side walls of excavation visibly intact, minimal rusting of tank and moderate to strong hydrocarbon odours noted.
Tank 2	2	4.2 L x 2.8 W x 2.8 D	Base and side walls of excavation visibly intact, minimal rusting of tank and moderate hydrocarbon odours noted. It should be noted that no odour was reported in base sample S11.
Tank 3	3	4.2 L x 2.7 W x 2.8 D	Base and side walls of excavation visibly intact, minimal rusting of tank and moderate hydrocarbon odours noted.

5.2 Soil Conditions

Excavation 1, 2 and 3 were advanced into topsoil and silty clay with gravels present towards the base of each excavation. Soil samples collected from the base and walls of the excavations typically reported moderate to strong hydrocarbon odours. No staining or other obvious signs of contamination were noted.

Photoionisation detector (PID) sample readings from Excavation 1 ranged from 24.5 (S6) to 524.8 (S5) parts per million (ppm), while readings in Excavation 2 ranged from 3.4 (S11) to 90.2 (S7) ppm and Excavation 3 ranged from 39.4 (S18) to 160.3 (S17) ppm. These readings were consistent with the reported hydrocarbon odour e.g. strong odour noted in S5 and no odour noted in S11.

Soil removed from the excavations and stockpiled on-site consisted of topsoil, silty clay and gravely clay. Hydrocarbon odour was reported in all stockpiles (Stockpile 1 to Stockpile 4), with a strong odour noted in SP4 obtained from Stockpile 2.

5.3 Validation Sample Analytical Results

A total of 18 primary (S1 to S18) and three duplicate (QC1 to QC3) soil validation samples were collected from the three excavations (i.e. from each side wall and two from the base). Analytical soil data is presented on **Table T4 (Appendix B)** and is summarised below:

- Concentrations of BTEX were reported below the adopted RAC.
- Concentrations of TRH were reported below the adopted RAC.
- Concentrations of PAH were reported below the adopted RAC.
- Concentrations of Phenols were reported below the adopted RAC.
- Concentrations of heavy metals were reported below the adopted RAC.
- Concentrations of PCBs were reported below the adopted RAC.
- Concentrations of VOCs were reported below the adopted RAC.

5.4 Stockpile Sample Analytical Results

A total of 11 primary (SP1 to SP11) and two duplicate (QC4 and QC5) soil stockpile samples were collected from the four stockpiles. Two samples were collected from Stockpile 1 (kerosene, volume of 15m^3), 3 samples were collected from Stockpile 2 (petrol, volume of 25 m^3), 5 samples were collected from Stockpile 3 (diesel, volume of 40 m^3) and 1 sample was collected from Stockpile 4 (topsoil, volume of 16m^3). Analytical soil data is presented on **Table T4 (Appendix B)** and is summarised below:

- Concentrations of BTEX were reported below the adopted RAC.
- Concentrations of TRH C_6-C_{10} less BTEX were reported above the adopted RAC in samples QC4 (SP4), QC5 (SP9) and SP10, with exceeding results ranging from 80 mg/kg (SP10) to 190 mg/kg (QC5). All other samples reported concentrations of TRH C_6-C_{10} less BTEX below the adopted RAC.
- Concentrations of TRH C_{10}-C_{16} less naphthalene were reported above the adopted RAC in samples SP9, QC5 (SP9), SP10 and SP11, with exceeding results ranging from 1590 mg/kg (SP11) to 4570 mg/kg (SP10). All other samples reported concentrations of TRH C_{10}-C_{16} less naphthalene below the adopted RAC.
- Concentrations of PAH were below the adopted RAC.
- Concentrations of Phenols were below the adopted RAC.
- Concentrations of heavy metals were below the adopted RAC.
- Concentrations of PCBs were below the adopted RAC.
- Concentrations of VOCs were below the adopted RAC.
- No asbestos fibres were detected in any of the 13 samples analysed.

Concentrations of COPCs in the stockpiled material were also below the waste disposal criteria, as the material was later removed from Site. Refer to waste classification letter in **Appendix H**.

5.5 Imported Excavated Natural Material Analytical Results

A total of four primary (SOB1 to SOB4) and one duplicate (OBQA1) soil characterisation samples were collected from the ENM prior to it being imported to Site. Analytical soil data is presented on **Table T4 (Appendix B)** and is summarised below:

- Concentrations of BTEX were reported below the adopted RAC.
- Concentrations of TRH were reported below the adopted RAC.
- Concentrations of PAH were reported below the adopted RAC.
- Concentrations of Phenols were reported below the adopted RAC.
- Concentrations of heavy metals were reported below the adopted RAC.
- Concentrations of OCPs and OPPs were reported below the adopted RAC.
- Concentrations of PCBs were reported below the adopted RAC.
- No asbestos fibres were detected in any of the four primary and QC samples analysed.

6.0 Discussion

6.1 Validation Samples

A total of 21 soil samples (including QAQC) were collected for validation purposes from natural materials surrounding the USTs and within a close proximity to other UPSS infrastructure.

Laboratory analysis of all samples collected reported concentrations of all CoPCs less than the laboratory Limit of reporting (LOR) and/or adopted RAC.

Based on field observations made during validation works and laboratory analysis of collected validation samples, AECOM considers that the site has been appropriately validated with no residual contamination associated with previous fuel storage infrastructure within the Site.

6.2 Stockpile Samples

A total of 13 soil samples (including QAQC) were collected from approximately 96 m^3 of excavated fill materials surrounding the USTs.

Laboratory analysis of all collected samples returned concentrations of all CoPCs less than the laboratory LOR and/or RAC with the exception of:

- TRH C_6-C_{10} less BTEX concentrations exceeding the RAC in three samples collected.
- TRH C_{10}-C_{16} less naphthalene concentrations exceeding the RAC in four samples collected.

Excavated materials were transported to Horsley Park Waste Management Facility, which is licenced to receive restricted solid waste.

AECOM considers that based on the laboratory analysis of collected stockpile samples and collated waste disposal documentation, that the fill materials excavated from the Site have been appropriately characterised and disposed of.

6.3 Imported Excavated Natural Material

A total of 5 soil samples (including QAQC) were collected from the approximately 32 t of imported ENM material to ensure the suitability of the material for on-site use to fill each excavation.

ENM comprised of light grey to brown crushed shale material sourced from Boral Quarry at Kaveneys Road, Hall, NSW. During inspection no visual or olfactory indications such as staining, odours or other anthropogenic inclusions were noted.

Laboratory analysis of all samples collected reported concentrations of all CoPCs less than the laboratory LOR and/or adopted RAC.

Based on field observations made during ENM fill inspection and laboratory analysis of collected characterisation samples, AECOM considers that the imported ENM material is suitable for use within the Site and does not pose a risk to human health or the environment.

7.0 Conclusions

AECOM Australia Pty Ltd (AECOM) was engaged by Justice and Community Safety Directorate (JACSD) to prepare this report to document the removal of the underground petroleum storage system (UPSS) and validate the suitability of the associated excavations located at the former West Belconnen Fire Station (the Site).

The objectives of the works were to remove UPSS infrastructure and validate the former UPSS excavation to suitability for the proposed future land use (i.e. Community Facility Zone (CFZ) with potential for a childcare centre). It should be noted that only soils from the base and walls of excavation, stockpiles and imported excavated natural material (ENM) were sampled during the UPSS validation works. The samples within this report validated the UPSS excavations only and not the wider Site.

To meet the objectives, the following scope of works was undertaken between AECOM and EPS for JACSD:

- Lodge a DA and obtain development approval for the Site.
- Prepare and adhere to a Site Specific Work Health and Safety Plan and Environmental Management Plan.
- Underground service locating by a Telstra accredited locator with reference to Dial Before You Dig (DBYD) plans.
- Removal of UPSS which included three USTs up to 4,500 L, two fuel dispenser pumps, three vent pipes and associated pipework.
- Collection of 18 soil validation samples (SP01 to SP18) from the excavations formed by UPSS removal plus two quality control / quality assurance (QAQC) samples (QC01 and QC02).
- Stockpiling of soils excavated during UPSS removal works into four separate stockpiles. Collection of 11 soil samples for characterisation of stockpiled material plus 2 QAQC samples (QC03 and QC04).
- Inspection and collection of soil samples (SOB01 to SOB04) from excavated natural material (ENM) at its source (Boral Quarry at Kaveneys Road, Hall, NSW).
- Backfilling of excavations with imported ENM soils.
- Laboratory analysis of selected soil samples for contaminants of potential concern (CoPC).
- Preparation of one Waste Classification Letters for all soils within the four stockpiles for off-Site disposal.

The results of the field activities can be summarised as follows:

- All UPSS tanks and associated infrastructure was removed and disposed off-site at a licensed waste disposal facility.
- Laboratory analysis of samples collected from the base and walls of three excavations reported concentrations of all CoPCs less than the laboratory LOR and/or adopted RAC, indicating that the UPSS excavations were appropriately validated.
- A total of 96 m^3 of excavated materials were classified and disposed off-site as solid waste (refer to AECOM, 2014b). It should be noted that concentrations of COPCs in samples collected from the stockpiles were below the laboratory LOR and/or adopted RAC, with the exception of TRH C_6-C_{10} less BTEX and TRH C_{10}-C_{16} less naphthalene.
- A total of 32 t of suitable ENM was imported to the Site following an inspection of the material and analysis of samples collected, which reported concentrations of all COPCs below the laboratory LOR and/or adopted RAC.

AECOM considers that validation of the UPSS excavation was completed to a standard acceptable for the proposed future land use i.e. Community Facility Zone (CFZ) with potential for a childcare centre.

8.0 References

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Appendix A

Figures

G:\Projects\60316172 West Belconnen Fire Station\FIGURES\UPSS Validation Report\60316172 F1 Site Location 26 09 2014 TO

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SITE LOCATION
UPSS Validation Report
Former West Belconnen Fire Station
Block 6, Section 97, Charnwood, ACT

FIGURE 1

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SITE LAYOUT
UPSS Validation Report
Former West Belconnen Fire Station
Block 6, Section 97, Charnwood, ACT

FIGURE 2

G:\Projects\60316172 West Belconnen Fire Station\FIGURES\UPSS Validation\60316172 F3 Excavation and Stockpile Sampling Locations 26.09.2014 TO

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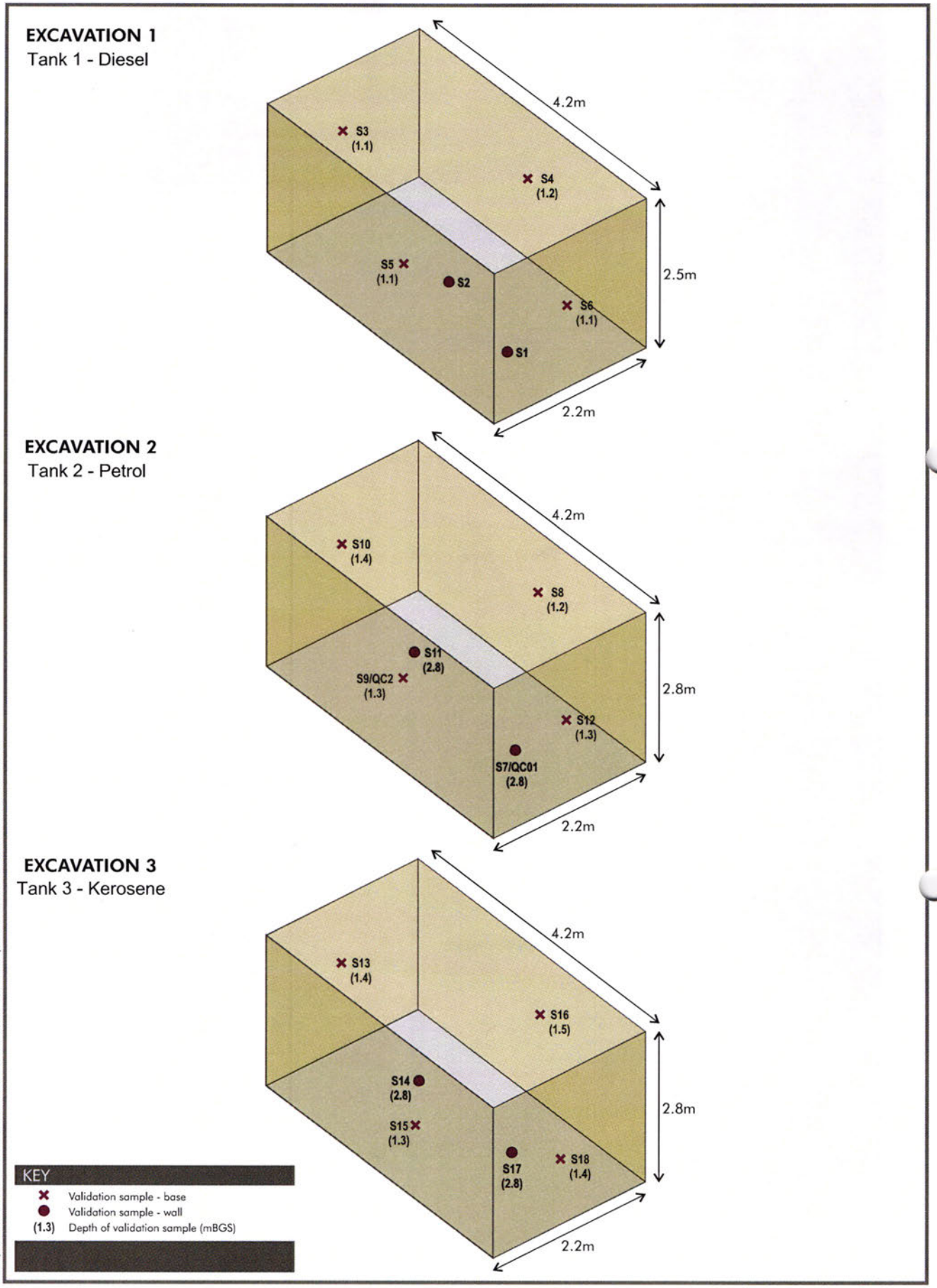
EXCAVATION AND STOCKPILE SAMPLING LOCATIONS

UPSS Validation Report
Former West Belconnen Fire Station
Block 6, Section 97, Charnwood, ACT

FIGURE 3



G:\Projects\60316172 West Belconnen Fire Station\FIGURES\UPSS Validation Report\60316172 F4 Excavation Detail 26 09 2014 TO

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EXCAVATION DETAIL
UPSS Validation Report
Former West Belconnen Fire Station
Block 6, Section 97, Charnwood, ACT

FIGURE 4

Appendix B

Tables

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Table T1 - Materials Tracking Register

Client Name: Justice and Community Safety Directorate
Project Name: Charnwood UPSS Validation Report
Project No: 60316172

EXCAVATIONS			
Excavation ID	Infrastructure ID	Material Description	Dimensions at Ground Surface (m)
Excavation 1	Tank 1	Tank sands and Natural Clay	4.2 L x 2.2 W x 2.5 D
Excavation 2	Tank 2	Tank sands and Natural Clay	4.2 L x 2.8 W x 2.8 D
Excavation 3	Tank 3	Tank sands and Natural Clay	4.2 L x 2.7 W x 2.8 D

TANKS		
Tank ID	Capacity (L)	Product
Tank 1	~ 4500	Kerosene
Tank 2	~ 4500	Diesel
Tank 3	~ 4500	Petrol

STOCKPILE MATERIALS TRACKING					
Stockpile ID	Status/Classification	Material Type	Origin	Volume (m3)	Destination
Stockpile 1	Disposed off-site	Tank sands and Natural Clay	Excavation 1	15	Horsley Park Waste Management Facility
Stockpile 2	Disposed off-site	Tank sands and Natural Clay	Excavation 2	25	Horsley Park Waste Management Facility
Stockpile 3	Disposed off-site	Tank sands and Natural Clay	Excavation 3	40	Horsley Park Waste Management Facility
Stockpile 4	Disposed off-site	Topsoil	Topsoil	16	Horsley Park Waste Management Facility
				Total stockpile volume	96

MATERIALS ON/OFF-SITE TRANSFER				
Transfer	Material Description	Weight	Validation Samples	Waste Classification
Off-site	Tank sands, Natural Clay and Topsoil	70.6 tonnes	SP01 to SP11	Solid (non-putrescible)
On-site	Imported ENM	32 tonnes	SOB1 to SOB4	Suitable for proposed land use.

Notes
ENM = Excavated Natural Material

Table T2 - Sample Register

		Sample ID	Date	Type	Sample Depth Field (m BGS)	Fill (F) or Natural (N)	Origin	Description	PID Reading (ppm)	Comments
Validation Samples	Excavation 1	S1	27/08/2014	Validation	2.5	N	Base	Gravely Clay	71.3	HCO
		S2	27/08/2014	Validation	2.5	N	Base	Gravely Clay	103.6	HCO
		S3	27/08/2014	Validation	1.0	N	Western Wall	Silty Clay	63.7	HCO
		S4	27/08/2014	Validation	1.2	N	Northern Wall	Silty Clay	144.3	HCO
		S5	27/08/2014	Validation	1.1	N	Southern Wall	Silty Clay	524.8	Strong HCO
		S6	27/08/2014	Validation	1.1	N	Eastern Wall	Clay	24.5	HCO
	Excavation 2	S7	27/08/2014	Validation	2.8	N	Base	Silty Gravel	90.2	HCO
		S8	27/08/2014	Validation	1.2	N	Northern Wall	Silty Gravel	69.4	HCO
		S9	27/08/2014	Validation	1.3	N	Southern Wall	Silty Gravel	12.4	HCO
		S10	27/08/2014	Validation	1.4	N	Western Wall	Silty Clay	19.1	HCO
		S11	27/08/2014	Validation	2.8	N	Base	Silty Clay	3.4	No HCO
		S12	27/08/2014	Validation	1.3	N	Eastern Wall	Silty Clay	80.7	HCO
	Excavation 3	S13	27/08/2014	Validation	1.4	N	Western Wall	Clay	47.8	HCO
		S14	27/08/2014	Validation	2.8	N	Base	Silty Gravel	78.9	HCO
		S15	27/08/2014	Validation	1.3	N	Southern Wall	Clay	116.0	HCO
		S16	27/08/2014	Validation	1.5	N	Northern Wall	Gravely Clay	73.2	HCO
		S17	27/08/2014	Validation	2.8	N	Base	Gravely Clay	160.3	HCO
		S18	27/08/2014	Validation	1.4	N	Eastern Wall	Silty Clay	39.4	HCO
Stockpile Sampling	Stockpile 1	SP7	27/08/2014	Stockpile	-	F	Excavation 1	Silt	197.3	HCO
		SP8	27/08/2014	Stockpile	-	F	Excavation 1	Silt	13.3	HCO
	Stockpile 2	SP4	27/08/2014	Stockpile	-	F	Excavation 2	Silty Clay	680.1	Strong HCO
		SP5	27/08/2014	Stockpile	-	F	Excavation 2	Silty Clay	354.2	HCO
		SP6	27/08/2014	Stockpile	-	F	Excavation 2	Silt	165.8	HCO
	Stockpile 3	SP2	27/08/2014	Stockpile	-	F	Excavation 3	Topsoil	123.1	HCO
		SP3	27/08/2014	Stockpile	-	F	Excavation 3	Topsoil	121.4	HCO
		SP9	27/08/2014	Stockpile	-	F	Excavation 3	Gravely Clay	39.8	HCO
		SP10	27/08/2014	Stockpile	-	F	Excavation 3	Gravely Clay	211.3	HCO
		SP11	27/08/2014	Stockpile	-	F	Excavation 3	Gravely Clay	86.8	HCO
	Stockpile 4	SP1	27/08/2014	Stockpile	-	F	Topsoil	Topsoil	171.5	HCO
ENM		SOB1	4/09/2014	Characterisation	-	F	Off-site imported ENM for backfilling	Sand	-	NOC
		SOB2	4/09/2014	Characterisation	-	F	Off-site imported ENM for backfilling	Sand	-	NOC
		SOB3	4/09/2014	Characterisation	-	F	Off-site imported ENM for backfilling	Sand	-	NOC
		SOB4	4/09/2014	Characterisation	-	F	Off-site imported ENM for backfilling	Sand	-	NOC

Notes

m BGS = metres below ground surface
ENM = excavated natural material
ppm = parts per million
NOC = No Observable Contamination
HCO = Hydrocarbon Odour

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Table T3 - Soil Criteria Selection Process

Client Name: Justice and Community Safety Directorate
Project Name: Charnwood UPSS Validation Report
Project No: 60316172

ChemName	Units	LOR	NEPC 2013 HIL A - Low Density Residential	NEPM 2013 HSL A&B - Sand 1 to <2 m	CRC CARE 2011 HSL A - Direct Contact	US EPA May 2014 - Residential Soil	Adopted Remediation Acceptance Criteria (RAC)	
BTEX								
Benzene	mg/kg	0.1		0.5	100	1.2	0.5	
Toluene	mg/kg	0.1		220	14000	4900	220	
Ethylbenzene	mg/kg	0.1		NL	4500	5.8	NL	
Xylene (m & p)	mg/kg	0.2				550	550	(a)
Xylene (o)	mg/kg	0.1				650	650	
Xylene Total	mg/kg	0.3		60	12000	580	60	
TRH								
C6-C10	mg/kg	10		70	4400		70	
C6-C10 less BTEX (F1)	mg/kg	10		70	4400		70	
C10-C16	mg/kg	25		240	3300		240	
C10-C16 less NAPHTHALENE (F2)	mg/kg	25		240	3300		240	
C16-C34	mg/kg	90			4500		4500	
C34-C40	mg/kg	100			6300		6300	
C10 - C40 (Sum of Total)	mg/kg	50						
PAH								
Acenaphthene	mg/kg	0.1				3500		(c)
Acenaphthylene	mg/kg	0.1						(c)
Anthracene	mg/kg	0.1				17000		(c)
Benz(a)anthracene	mg/kg	0.1				0.15		(b), (c)
Benzo(a)pyrene	mg/kg	0.1				0.015		(b), (c)
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	3				3	
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	3				3	
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	3				3	
Benzo(b)fluoranthene	mg/kg	0.5				0.15		(b), (c)
Benzo(g,h,i)perylene	mg/kg	0.1						(b), (c)
Benzo(k)fluoranthene	mg/kg	0.1				1.5		(b), (c)
Chrysene	mg/kg	0.1				15		(b), (c)
Dibenz(a,h)anthracene	mg/kg	0.1				0.015		(b), (c)
Fluoranthene	mg/kg	0.1				2300		(c)
Fluorene	mg/kg	0.1				2300		(c)
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1				0.15		(b), (c)
Naphthalene	mg/kg	0.1		NL	1400	3.8	NL	(c)
Phenanthrene	mg/kg	0.1						(c)
Pyrene	mg/kg	0.1				1700		(c)
PAHs (Sum of Total)	mg/kg	0.5	300				300	
Phenols								
2,4-dimethylphenol	mg/kg	0.5				1200	1200	
2-methylphenol	mg/kg	0.5				3100	3100	
2-nitrophenol	mg/kg	0.5						
3-&4-methylphenol	mg/kg	1						
4-chloro-3-methylphenol	mg/kg	0.5				6200	6200	
2,4,5-trichlorophenol	mg/kg	0.5				6200	6200	
2,4,6-trichlorophenol	mg/kg	0.5				48	48	
2,4-dichlorophenol	mg/kg	0.5				180	180	
2,6-dichlorophenol	mg/kg	0.5						
2-chlorophenol	mg/kg	0.5				390	390	
Phenol	mg/kg	0.5	3000			18000	3000	
Pentachlorophenol	mg/kg	2	100			0.99	100	
Total Phenols	mg/kg	0.1						
Metals								
Arsenic	mg/kg	3	100			0.67	100	
Cadmium	mg/kg	0.3	20			70	20	
Chromium (III+VI)	mg/kg	0.3	100			0.3	100	(d)
Copper	mg/kg	0.5	6000			3100	6000	
Lead	mg/kg	1	300			400	300	
Mercury	mg/kg	0.01	40			9.4	40	
Nickel	mg/kg	0.5	400			1500	400	
Zinc	mg/kg	0.5	7400			23000	7400	
Chlorinated Hydrocarbons								
1,1,1,2-tetrachloroethane	mg/kg	0.1				2	2	
1,1,1-trichloroethane	mg/kg	0.1				8100	8100	
1,1,2,2-tetrachloroethane	mg/kg	0.1				0.6	0.6	
1,1,2-trichloroethane	mg/kg	0.1				1.1	1.1	
1,1-dichloroethane	mg/kg	0.1				3.6	3.6	
1,1-dichloroethene	mg/kg	0.1				230	230	
1,1-dichloropropene	mg/kg	0.1						
1,2,3-trichloropropane	mg/kg	0.1				0.0051	0.0051	
1,2-dibromo-3-chloropropane	mg/kg	0.1				0.0053	0.0053	
1,2-dichloroethane	mg/kg	0.1				0.46	0.46	
1,2-Dichloroethene	mg/kg	1						
1,2-dichloropropane	mg/kg	0.1				1	1	
1,3-dichloropropane	mg/kg	0.1				1600	1600	
2,2-dichloropropane	mg/kg	0.1						
Bromochloromethane	mg/kg	0.1				150	150	
Bromodichloromethane	mg/kg	0.1				0.29	0.29	
Bromoform	mg/kg	0.1				67	67	
Carbon tetrachloride	mg/kg	0.1				0.65	0.65	
Chlorodibromomethane	mg/kg	0.1				0.73	0.73	
Chloroethane	mg/kg	1				14000	14000	
Chloroform	mg/kg	0.1				0.32	0.32	
cis-1,2-dichloroethene	mg/kg	0.1				160	160	
cis-1,3-dichloropropene	mg/kg	0.1						
Dibromomethane	mg/kg	0.1				23	23	
Dichloromethane	mg/kg	0.5				57	57	
Hexachlorobutadiene	mg/kg	0.1				6.8	6.8	
Trichloroethene	mg/kg	0.1				0.94	0.94	
Tetrachloroethene	mg/kg	0.1				24	24	
trans-1,2-dichloroethene	mg/kg	0.1				1600	1600	
trans-1,3-dichloropropene	mg/kg	0.1						
Vinyl chloride	mg/kg	0.1				0.059	0.059	
Halogenated Benzenes								
1,2,3-trichlorobenzene	mg/kg	0.1				49	49	
1,2,4-trichlorobenzene	mg/kg	0.1				24	24	
1,2-dichlorobenzene	mg/kg	0.1				1800	1800	
1,3-dichlorobenzene	mg/kg	0.1						
1,4-dichlorobenzene	mg/kg	0.1				2.6	2.6	

AECOM

Table T3 - Soil Criteria Selection Process

ChemName	Units	LOR	NEPC 2013 HIL A - Low Density Residential	NEPM 2013 HSL A&B - Sand 1 to <2 m	CRC CARE 2011 HSL A - Direct Contact	US EPA May 2014 - Residential Soil	Adopted Remediation Acceptance Criteria (RAC)
2-chlorotoluene	mg/kg	0.1				1600	1600
4-chlorotoluene	mg/kg	0.1				1600	1600
Bromobenzene	mg/kg	0.1				290	290
Chlorobenzene	mg/kg	0.1				280	280
Hexachlorobenzene	mg/kg	0.05	10			0.33	10
Halogenated Hydrocarbons							
1,2-dibromoethane	mg/kg	0.1				0.036	0.036
Bromomethane	mg/kg	1				6.8	6.8
Chloromethane	mg/kg	1				110	110
Dichlorodifluoromethane	mg/kg	1				87	87
Iodomethane	mg/kg	0.5					
Trichlorofluoromethane	mg/kg	1				730	730
MAH							
1,2,4-trimethylbenzene	mg/kg	0.1				58	58
1,3,5-trimethylbenzene	mg/kg	0.1				780	780
Isopropylbenzene	mg/kg	0.1				1900	1900
n-butylbenzene	mg/kg	0.1				3900	3900
n-propylbenzene	mg/kg	0.1				3300	3300
p-isopropyltoluene	mg/kg	0.1					
sec-butylbenzene	mg/kg	0.1				7800	7800
Styrene	mg/kg	0.1				6000	6000
tert-butylbenzene	mg/kg	0.1				7800	7800
Organochlorine Pesticides							
4,4-DDE	mg/kg	0.05				1.6	1.6
a-BHC	mg/kg	0.05				0.085	0.085
Aldrin	mg/kg	0.05				0.031	0.031
Aldrin + Dieldrin	mg/kg	0.05	6				6
b-BHC	mg/kg	0.05				0.3	0.3
chlordane	mg/kg	0.05	50				50
Chlordane (cis)	mg/kg	0.05					
Chlordane (trans)	mg/kg	0.05					
d-BHC	mg/kg	0.05					
DDD	mg/kg	0.05				2.2	2.2
DDT	mg/kg	0.2				1.9	1.9
DDT+DDE+DDD	mg/kg	0.05	240				240
Dieldrin	mg/kg	0.05				0.033	0.033
Endosulfan	mg/kg	0.05	270			370	270
Endosulfan I	mg/kg	0.05					
Endosulfan II	mg/kg	0.05					
Endosulfan sulphate	mg/kg	0.05					
Endrin	mg/kg	0.05	10			18	10
Endrin aldehyde	mg/kg	0.05					
Endrin ketone	mg/kg	0.05					
g-BHC (Lindane)	mg/kg	0.05				0.56	0.56
Heptachlor	mg/kg	0.05	6			0.12	6
Heptachlor epoxide	mg/kg	0.05				0.059	0.059
Methoxychlor	mg/kg	0.2	300			310	300
Organophosphorous Pesticides							
Azinophos methyl	mg/kg	0.05				180	180
Bromophos-ethyl	mg/kg	0.05					
Carbophenothion	mg/kg	0.05					
Chlorfenvinphos	mg/kg	0.05				43	43
Chlorpyrifos	mg/kg	0.05	160			62	160
Chlorpyrifos-methyl	mg/kg	0.05				620	620
Diazinon	mg/kg	0.05				43	43
Dichlorvos	mg/kg	0.05				1.8	1.8
Dimethoate	mg/kg	0.05				12	12
Ethion	mg/kg	0.05				31	31
Fenthion	mg/kg	0.05					
Malathion	mg/kg	0.05				1200	1200
Methyl parathion	mg/kg	0.2				15	15
Monocrotophos	mg/kg	0.2					
Prothiofos	mg/kg	0.05					
Other Pesticides							
Demeton-S-methyl	mg/kg	0.05					
Fenamiphos	mg/kg	0.05				15	15
Parathion	mg/kg	0.2				370	370
Pirimphos-ethyl	mg/kg	0.05					
Polychlorinated Biphenyls							
PCBs (Sum of Total)	mg/kg	0.1	1			0.24	1
Solvents							
Methyl Ethyl Ketone	mg/kg	5				27000	27000
2-hexanone (MBK)	mg/kg	5				200	200
4-Methyl-2-pentanone	mg/kg	1				5300	5300
Carbon disulfide	mg/kg	0.5				770	770
Vinyl acetate	mg/kg	5				910	910
VOCs							
1,3-Dichloropropene	mg/kg					1.8	1.8
cis-1,4-Dichloro-2-butene	mg/kg	0.5				0.0074	0.0074
Pentachloroethane	mg/kg	0.5				5.9	5.9
trans-1,4-Dichloro-2-butene	mg/kg	0.5				0.0074	0.0074

Notes:
LOR - Limit of Reporting
mg/kg - Milligrams per Kilogram
(a) Value for Xylene, m- adopted.
(b) Carcinogenic PAHs assessed as BaP TEQ.
(c) PAHs assessed as Total PAHs, as well as carcinogenic PAHs and napthalene individually.
(d) Value for Chromium VI adopted.

Field_ID	S1	S2	S3	S4	S5	S6	S7	QC1	S8	S9	QC2	S10	S11	S12	S13	S14	QC3	S15	S16	S17	S18	SP1	SP2	SP3	SP4	QC4
LocCode	S1	S2	S3	S4	S5	S6	S7	S7	S8	S9	S9	S10	S11	S12	S13	S14	S14	S15	S16	S17	S18	SP1	SP2	SP3	SP4	SP4
Sample_Depth_Range	2.5	2.5	1	1.2	1.1	1.1	2.8	2.8	1.2	1.3	1.3	1.4	2.8	1.3	1.4	2.8	2.8	1.3	1.5	2.8	1.4					
Sampled_Date	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014
Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D
ChemName	Units	LOR	Adopted Remediation Acceptance Criteria (RAC)																							
Asbestos																										
Asbestos Fibres	g/kg	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No	No	No	No	No
BTEX																										
Benzene	mg/kg	0.1	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3
Toluene	mg/kg	0.1	220	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.7
Ethylbenzene	mg/kg	0.1	NL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.4
Xylene (m & p)	mg/kg	0.2	550	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	21.2
Xylene (o)	mg/kg	0.1	550	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.8
Xylene Total	mg/kg	0.3	60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.3	<0.5	<0.5	<0.5	<0.5	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	29.8
TRH																										
C6-C10	mg/kg	10	70	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	16	<10	<10	<10	<10	<10	<10	<10	192
C6-C10 less BTEX (F1)	mg/kg	10	70	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	13	<10	<10	<10	<10	<10	<10	<10	149
C10-C16	mg/kg	25	240	70	<50	<50	<50	<50	<50	<50	<50	80	53	<50	<50	180	<50	<50	<50	<50	<50	<50	170	<50	<50	<50
C10-C16 less NAPHTHALENE (F2)	mg/kg	25	240	70	<50	<50	<50	<50	<50	<50	<50	80	53	<50	<50	180	<50	<50	<50	<50	<50	<50	170	<50	<50	<50
C16-C34	mg/kg	90	4500	<100	<100	<100	<100	<100	<100	<100	<100	<100	<90	<100	<100	190	<100	<100	<100	<100	<100	<100	170	<100	<100	<100
C34-C40	mg/kg	100	6300	<100	<100	<100	<100	<100	<100	<100	<100	<100	<120	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C10 - C40 (Sum of Total)	mg/kg	50		70	<50	<50	<50	<50	<50	<50	<50	80	<210	<50	<50	370	<50	<50	<50	<50	<50	<50	340	<50	<50	<50
PAH																										
Acenaphthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
Fluorene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.1	NL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	0.6	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	5
Phenanthrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
Pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7
PAHs (Sum of Total)	mg/kg	0.5	300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5	<0.5	0.8	<0.5	0.6	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.8
Phenols																										
2,4-dimethylphenol	mg/kg	0.5	1200	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	mg/kg	0.5	3100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	mg/kg	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-chloro-3-methylphenol	mg/kg	0.5	6200	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-trichlorophenol	mg/kg	0.5	6200	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	48	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	180	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	mg/kg	0.5	390	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenol	mg/kg	0.5	3000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2	100	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total Phenols	mg/kg	0.1		-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																										
Arsenic	mg/kg	3	100	<5	6	<5	<5	<5	<5	<5	<5	<5	<15	<5	<5	9	6	<5	<5	<5	7	5	<5	<5	15	<5	<5
Cadmium	mg/kg	0.3	20	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI)	mg/kg	0.3	100	20	10	15	10	12	20	10	11	7	14	7	20	26	14	36	38	27	22	19	18	23	18	25	23	5	7
Copper	mg/kg	0.5	6000	7	7	7	<5	<5	10	7	<5	<5	<5	2.9	<5	5	<5	11	8	7	<5	<5	6	5	7	8	10	<5	<5
Lead	mg/kg	1	300	19	11	10	9	9	12	9	10	8	12	10	10	42	13	16	19	30	10	14	18	10	41	16	13	31	46
Mercury	mg/kg	0.01	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	0.5	400	8	10	5	7	8	9	5	6	4	8	4	10	8	7	11	9	10	10	10	12	8	6	9	13	3	4
Zinc	mg/kg	0.5	7400	103	85	26	26	34	18	18	22	33	31	20	46	29	47	18	30	57	24	48	44	19	96	26	27	36	39
Chlorinated Hydrocarbons																										
1,1,1,2-tetrachloroethane	mg/kg	0.1	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	mg/kg	0.1	8100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-tetrachloroethane	mg/kg	0.1	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	mg/kg	0.1	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloroethane	mg/kg	0.1	3.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloroethene	mg/kg	0.1	230	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,3-trichloropropane	mg/kg	0.1	0.0051	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromo-3-chloropropane	mg/kg	0.1	0.0053	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloroethane	mg/kg	0.1	0.46	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethene	mg/kg	1		<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	0.1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,2-dichloropropane	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromochloromethane	mg/kg	0.1	150	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.1	0.29	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	mg/kg	0.1	67	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	mg/kg	0.1	0.65	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorodibromomethane	mg/kg	0.1	0.73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	mg/kg	1	14000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroform	mg/kg	0.1	0.32	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-dichloroethene	mg/kg	0.1	160	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	mg/kg	0.1	23	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichloromethane	mg/kg	0.5	57	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	6.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	mg/kg	0.1	0.94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	mg/kg	0.1	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-dichloroethene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	mg/kg	0.1	0.059	<5	<5	<5	<5	<5	<5	<5	<5	<5	<0.1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Halogenated Benzenes																										
1,2,3-trichlorobenzene	mg/kg	0.1	49	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-trichlorobenzene	mg/kg	0.1	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

AECOM

Table T4 - Soil Analytical Results

Client Name: Justice and Community Safety Directorate
Project Name: Charnwood UPSS Validation Report
Project No: 60316172

Field_ID	S1	S2	S3	S4	S5	S6	S7	QC1	S8	S9	QC2	S10	S11	S12	S13	S14	QC3	S15	S16	S17	S18	SP1	SP2	SP3	SP4	QC4
LocCode	S1	S2	S3	S4	S5	S6	S7	S7	S8	S9	S9	S10	S11	S12	S13	S14	S14	S15	S16	S17	S18	SP1	SP2	SP3	SP4	SP4
Sample_Depth_Range	2.5	2.5	1	1.2	1.1	1.1	2.8	2.8	1.2	1.3	1.3	1.4	2.8	1.3	1.4	2.8	2.8	1.3	1.5	2.8	1.4					
Sampled_Date	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014
Sample_Type	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Interlab_D	Normal	Normal	Normal	Normal	Normal	Field_D	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Field_D
ChemName	**Units**	**LOR**	**Adopted Remediation Acceptance Criteria (RAC)**																									
1,2-dichlorobenzene	mg/kg	0.1	1800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichlorobenzene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-dichlorobenzene	mg/kg	0.1	2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorotoluene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-chlorotoluene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	mg/kg	0.1	290	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	mg/kg	0.1	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobenzene	mg/kg	0.05	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Halogenated Hydrocarbons																												
1,2-dibromoethane	mg/kg	0.1	0.036	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	mg/kg	1	6.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	mg/kg	1	110	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	mg/kg	1	87	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Iodomethane	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	mg/kg	1	730	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
MAH																												
1,2,4-trimethylbenzene	mg/kg	0.1	58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.7	20
1,3,5-trimethylbenzene	mg/kg	0.1	780	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	5.1
Isopropylbenzene	mg/kg	0.1	1900	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
n-butylbenzene	mg/kg	0.1	3900	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8
n-propylbenzene	mg/kg	0.1	3300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2
p-isopropyltoluene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
sec-butylbenzene	mg/kg	0.1	7800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	mg/kg	0.1	6000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
tert-butylbenzene	mg/kg	0.1	7800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Organochlorine Pesticides																												
4,4-DDE	mg/kg	0.05	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05	0.085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05	0.031	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg	0.05	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
chlordane	mg/kg	0.05	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (cis)	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlordane (trans)	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DDT	mg/kg	0.2	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg	0.05	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05	0.033	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan	mg/kg	0.05	270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05	0.059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.2	300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Organophosphorous Pesticides																												
Azinophos methyl	mg/kg	0.05	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05	160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05	620	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.05	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Pesticides																												
Demeton-S-methyl	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.2	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pirimiphos-ethyl	mg/kg	0.05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Polychlorinated Biphenyls																												
PCBs (Sum of Total)	mg/kg	0.1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solvents																												
Methyl Ethyl Ketone	mg/kg	5	27000	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-hexanone (MBK)	mg/kg	5	200	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-pentanone	mg/kg	1	5300	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Carbon disulfide	mg/kg	0.5	770	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl acetate	mg/kg	5	910	<5	<5	<5	<5	<5	<5	<5	<5	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
VOCs																												
1,3-Dichloropropene	mg/kg		1.8	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,4-Dichloro-2-butene	mg/kg	0.5	0.0074	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	mg/kg	0.5	5.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,4-Dichloro-2-butene	mg/kg	0.5	0.0074	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Notes:
LOR - Limit of Reporting
mg/kg - Milligrams per Kilogram
- = not analysed
Concentration exceeds RAC - Resident

Field_ID	SP5	SP6	SP7	SP8	SP9	QC5	SP10	SP11	SOB1	OBQA1	SOB2	SOB3	SOB4
LocCode	SP5	SP6	SP7	SP8	SP9	SP9	SP10	SP11	SOB1	SOB1	SOB2	SOB3	SOB4
Sample_Depth_Range													
Sampled_Date	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	4/09/2014	4/09/2014	4/09/2014	4/09/2014	4/09/2014
Sample_Type	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Field_D	Normal	Normal	Normal

ChemName	Units	LOR	Adopted Remediation Acceptance Criteria (RAC)													
Asbestos																
Asbestos Fibres	g/kg	0.1		No	No	No	No	No	No	No	No	No	No	No	No	No
BTEX																
Benzene	mg/kg	0.1	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.1	220	1.2	<0.5	<0.5	<0.5	0.8	0.7	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	0.1	NL	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	mg/kg	0.2	550	2.9	0.9	<0.5	<0.5	6.1	5.7	8	2.1	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (o)	mg/kg	0.1	650	1.2	<0.5	<0.5	<0.5	2.3	2	3.2	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total	mg/kg	0.3	60	4.1	0.9	<0.5	<0.5	8.4	7.7	11.2	2.9	<0.5	<0.5	<0.5	<0.5	<0.5
TRH																
C6-C10	mg/kg	10	70	21	<10	<10	<10	72	190	92	43	<10	<10	<10	<10	<10
C6-C10 less BTEX (F1)	mg/kg	10	70	15	<10	<10	<10	63	190	80	40	<10	<10	<10	<10	<10
C10-C16	mg/kg	25	240	<50	<50	<50	<50	3140	3600	4570	1590	<50	<50	<50	<50	<50
C10-C16 less NAPHTHALENE (F2)	mg/kg	25	240	<50	<50	<50	<50	3140	3600	4570	1590	<50	<50	<50	<50	<50
C16-C34	mg/kg	90	4500	<100	<100	<100	<100	2460	2800	3620	1480	<100	<100	<100	<100	<100
C34-C40	mg/kg	100	6300	<100	<100	<100	<100	<100	<120	<100	<100	<100	<100	<100	<100	<100
C10 - C40 (Sum of Total)	mg/kg	50		<50	<50	<50	<50	5600	6400	8190	3070	<50	<50	<50	<50	<50
PAH																
Acenaphthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	3	0.6	0.6	0.6	0.6	0.6	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	3	1.2	1.2	1.2	1.2	1.2	-	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	3	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	5.7	7.5	8.3	3.1	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.1	NL	1	<0.5	<0.5	<0.5	0.7	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	10.3	14	15.3	5.7	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	1.9	1.8	2.8	1	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of Total)	mg/kg	0.5	300	<0.5	<0.5	<0.5	<0.5	18.6	79	28	9.8	<0.5	<0.5	<0.5	<0.5	<0.5
Phenols																
2,4-dimethylphenol	mg/kg	0.5	1200	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	mg/kg	0.5	3100	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	mg/kg	1		<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	<1	<1
4-chloro-3-methylphenol	mg/kg	0.5	6200	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-trichlorophenol	mg/kg	0.5	6200	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	48	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	180	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	mg/kg	0.5	390	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenol	mg/kg	0.5	3000	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2	100	<2	<2	<2	<2	<2	-	<2	<2	<2	<2	<2	<2	<2
Total Phenols	mg/kg	0.1		-	-	-	-	-	0.1	-	-	-	-	-	-	-
Metals																
Arsenic	mg/kg	3	100	<5	<5	<5	<5	6	3	<5	<5	<5	<5	<5	<5	<5
Cadmium	mg/kg	0.3	20	<1	<1	<1	<1	<1	<0.3	<1	<1	<1	<1	<1	<1	<1
Chromium (III+VI)	mg/kg	0.3	100	6	5	10	8	37	21	21	30	17	17	16	15	18
Copper	mg/kg	0.5	6000	<5	<5	<5	<5	8	8.3	8	7	12	14	12	13	16
Lead	mg/kg	1	300	14	7	12	6	34	37	37	25	14	14	12	14	16
Mercury	mg/kg	0.01	40	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	0.5	400	3	2	5	4	8	6.8	8	8	8	8	8	8	9
Zinc	mg/kg	0.5	7400	48	26	69	61	84	99	81	57	58	57	57	54	60
Chlorinated Hydrocarbons																
1,1,1,2-tetrachloroethane	mg/kg	0.1	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1,1-trichloroethane	mg/kg	0.1	8100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1,2,2-tetrachloroethane	mg/kg	0.1	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1,2-trichloroethane	mg/kg	0.1	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1-dichloroethane	mg/kg	0.1	3.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1-dichloroethene	mg/kg	0.1	230	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,1-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,2,3-trichloropropane	mg/kg	0.1	0.0051	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,2-dibromo-3-chloropropane	mg/kg	0.1	0.0053	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,2-dichloroethane	mg/kg	0.1	0.46	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,2-Dichloroethene	mg/kg	1		<1	<1	<1	<1	<1	-	<1	<1	-	-	-	-	-
1,2-dichloropropane	mg/kg	0.1	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,3-dichloropropane	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
2,2-dichloropropane	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Bromochloromethane	mg/kg	0.1	150	-	-	-	-	-	<0.5	-	-	-	-	-	-	-
Bromodichloromethane	mg/kg	0.1	0.29	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Bromoform	mg/kg	0.1	67	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Carbon tetrachloride	mg/kg	0.1	0.65	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Chlorodibromomethane	mg/kg	0.1	0.73	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Chloroethane	mg/kg	1	14000	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
Chloroform	mg/kg	0.1	0.32	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
cis-1,2-dichloroethene	mg/kg	0.1	160	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
cis-1,3-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Dibromomethane	mg/kg	0.1	23	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Dichloromethane	mg/kg	0.5	57	-	-	-	-	-	<2.5	-	-	-	-	-	-	-
Hexachlorobutadiene	mg/kg	0.1	6.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Trichloroethene	mg/kg	0.1	0.94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Tetrachloroethene	mg/kg	0.1	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
trans-1,2-dichloroethene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
trans-1,3-dichloropropene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Vinyl chloride	mg/kg	0.1	0.059	<5	<5	<5	<5	<5	<0.5	<5	<5	-	-	-	-	-
Halogenated Benzenes																
1,2,3-trichlorobenzene	mg/kg	0.1	49	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,2,4-trichlorobenzene	mg/kg	0.1	24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-

Table T4 - Soil Analytical Results

Field_ID	SP5	SP6	SP7	SP8	SP9	QC5	SP10	SP11	SOB1	OBQA1	SOB2	SOB3	SOB4
LocCode	SP5	SP6	SP7	SP8	SP9	SP9	SP10	SP11	SOB1	SOB1	SOB2	SOB3	SOB4
Sample_Depth_Range													
Sampled_Date	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	27/08/2014	4/09/2014	4/09/2014	4/09/2014	4/09/2014	4/09/2014
Sample_Type	Normal	Normal	Normal	Normal	Normal	Interlab_D	Normal	Normal	Normal	Field_D	Normal	Normal	Normal
ChemName	**Units**	**LOR**	**Adopted Remediation Acceptance Criteria (RAC)**											
1,2-dichlorobenzene	mg/kg	0.1	1800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,3-dichlorobenzene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
1,4-dichlorobenzene	mg/kg	0.1	2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
2-chlorotoluene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
4-chlorotoluene	mg/kg	0.1	1600	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Bromobenzene	mg/kg	0.1	290	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Chlorobenzene	mg/kg	0.1	280	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05	10	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Halogenated Hydrocarbons																
1,2-dibromoethane	mg/kg	0.1	0.036	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Bromomethane	mg/kg	1	6.8	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
Chloromethane	mg/kg	1	110	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
Dichlorodifluoromethane	mg/kg	1	87	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
Iodomethane	mg/kg	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<25	<0.5	<0.5	-	-	-	-	-
Trichlorofluoromethane	mg/kg	1	730	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
MAH																
1,2,4-trimethylbenzene	mg/kg	0.1	58	2.4	0.8	<0.5	<0.5	8.4	7.8	10.6	2.8	-	-	-	-	-
1,3,5-trimethylbenzene	mg/kg	0.1	780	0.7	<0.5	<0.5	<0.5	3.5	2.3	4.4	1.1	-	-	-	-	-
Isopropylbenzene	mg/kg	0.1	1900	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
n-butylbenzene	mg/kg	0.1	3900	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.8	<0.5	-	-	-	-	-
n-propylbenzene	mg/kg	0.1	3300	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
p-isopropyltoluene	mg/kg	0.1		<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.8	<0.5	-	-	-	-	-
sec-butylbenzene	mg/kg	0.1	7800	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.7	<0.5	-	-	-	-	-
Styrene	mg/kg	0.1	6000	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
tert-butylbenzene	mg/kg	0.1	7800	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-
Organochlorine Pesticides																
4,4-DDE	mg/kg	0.05	1.6	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
a-BHC	mg/kg	0.05	0.085	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05	0.031	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin + Dieldrin	mg/kg	0.05	6	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC	mg/kg	0.05	0.3	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
chlordane	mg/kg	0.05	50	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane (cis)	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane (trans)	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
d-BHC	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDD	mg/kg	0.05	2.2	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDT	mg/kg	0.2	1.9	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
DDT+DDE+DDD	mg/kg	0.05	240	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05	0.033	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan	mg/kg	0.05	270	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan I	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan II	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulphate	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05	10	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin ketone	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
g-BHC (Lindane)	mg/kg	0.05	0.56	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	6	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05	0.059	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	mg/kg	0.2	300	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Organophosphorous Pesticides																
Azinophos methyl	mg/kg	0.05	180	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	mg/kg	0.05	43	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	mg/kg	0.05	160	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	mg/kg	0.05	620	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	mg/kg	0.05	43	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorvos	mg/kg	0.05	1.8	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Dimethoate	mg/kg	0.05	12	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	mg/kg	0.05	31	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Malathion	mg/kg	0.05	1200	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl parathion	mg/kg	0.2	15	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Monocrotophos	mg/kg	0.2		-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Prothiofos	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Other Pesticides																
Demeton-S-methyl	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	mg/kg	0.05	15	-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	mg/kg	0.2	370	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	mg/kg	0.05		-	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated Biphenyls																
PCBs (Sum of Total)	mg/kg	0.1	1	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Solvents																
Methyl Ethyl Ketone	mg/kg	5	27000	<5	<5	<5	<5	<5	<50	<5	<5	-	-	-	-	-
2-hexanone (MBK)	mg/kg	5	200	<5	<5	<5	<5	<5	<25	<5	<5	-	-	-	-	-
4-Methyl-2-pentanone	mg/kg	1	5300	<5	<5	<5	<5	<5	<5	<5	<5	-	-	-	-	-
Carbon disulfide	mg/kg	0.5	770	<0.5	<0.5	<0.5	<0.5	<0.5	<2.5	<0.5	<0.5	-	-	-	-	-
Vinyl acetate	mg/kg	5	910	<5	<5	<5	<5	<5	<50	<5	<5	-	-	-	-	-
VOCs																
1,3-Dichloropropene	mg/kg		1.8	<1	<1	<1	<1	<1	-	<1	<1	-	-	-	-	-
cis-1,4-Dichloro-2-butene	mg/kg	0.5	0.0074	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	-	-	-	-	-
Pentachloroethane	mg/kg	0.5	5.9	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	-	-	-	-
trans-1,4-Dichloro-2-butene	mg/kg	0.5	0.0074	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<0.5	<0.5	-	-	-	-	-

Notes:
LOR - Limit of Reporting
mg/kg - Milligrams per Kilogram
- = not analysed
Concentration exceeds RAC - Resident

AECOM

Table T5 - QA/QC

Client Name: Justice and Community Safety Directorate
Project Name: Charnwood UPSS Validation Report
Project No: 60316172

Sample_Type	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Interlab_D	RPD	Primary	Interlab_D	RPD
Field_ID	S7	QC1		S14	QC3		SP4	QC4		SOB1	OBQA1		S9	QC2		SP9	QC5	
Sampled_Date	27/08/2014	27/08/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014		4/09/2014	4/09/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014	

ChemName	Units	LOR																
BTEX																		
Benzene	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	0.3	**40**	<0.2	<0.2	0	<0.2	<0.1	0	<0.2	<0.5	0
Toluene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	0.8	<0.5	**46**	1.4	8.7	**145**	<0.5	<0.5	0	<0.5	<0.1	0	0.8	0.7	13
Ethylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	4.4	**159**	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Xylene (m & p)	mg/kg	0.5 (Primary): 1 (Interlab)	<0.5	<0.5	0	1.6	<0.5	**105**	2.5	21.2	**158**	<0.5	<0.5	0	<0.5	<0.2	0	6.1	5.7	7
Xylene (o)	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	0.6	<0.5	18	1.0	8.6	**158**	<0.5	<0.5	0	<0.5	<0.1	0	2.3	2.0	14
Xylene Total	mg/kg	0.5 (Primary): 1.5 (Interlab)	<0.5	<0.5	0	2.2	<0.5	**126**	3.5	29.8	**158**	<0.5	<0.5	0	<0.5	<0.3	0	8.4	7.7	9
TRH																		
C6-C10	mg/kg	10 (Primary): 25 (Interlab)	<10.0	<10.0	0	16.0	<10.0	**46**	16.0	192.0	**169**				<10.0	<25.0	0	72.0	190.0	**90**
C6-C10	mg/kg	10										<10.0	<10.0	0						
C6-C10 less BTEX (F1)	mg/kg	10										<10.0	<10.0	0						
C6-C10 less BTEX (F1)	mg/kg	10 (Primary): 25 (Interlab)	<10.0	<10.0	0	13.0	<10.0	26	11.0	149.0	**173**				<10.0	<25.0	0	63.0	190.0	**100**
C10-C16	mg/kg	50 (Primary): 25 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0				80.0	53.0	**41**	3140.0	3600.0	14
C10-C16	mg/kg	50										<50.0	<50.0	0						
F2-NAPHTHALENE	mg/kg	50 (Primary): 25 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0				80.0	53.0	**41**	3140.0	3600.0	14
F2-NAPHTHALENE	mg/kg	50										<50.0	<50.0	0						
C16-C34	mg/kg	100 (Primary): 90 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0				<100.0	<90.0	0	2460.0	2800.0	13
C16-C34	mg/kg	100										<100.0	<100.0	0						
C34-C40	mg/kg	100 (Primary): 120 (Interlab)	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<100.0	0				<100.0	<120.0	0	<100.0	<120.0	0
C34-C40	mg/kg	100										<100.0	<100.0	0						
C10 - C40 (Sum of Total)	mg/kg	50										<50.0	<50.0	0						
C10 - C40 (Sum of Total)	mg/kg	50 (Primary): 210 (Interlab)	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<50.0	0				80.0	<210.0	0	5600.0	6400.0	13
PAH																		
Acenaphthene	mg/kg	0.5 (Primary): 2 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<2.0	0
Acenaphthylene	mg/kg	0.5 (Primary): 1.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<1.1	0
Anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	1.3	**89**
Benz(a)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.2	0	<0.5	<0.5	0
Benzo(a)pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.2	0	<0.5	<0.5	0
Benzo(a)pyrene TEQ (half LOR)	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0	0.6	0.6	0						
Benzo(a)pyrene TEQ (LOR)	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0	1.2	1.2	0						
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
Benzo(b)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
Benzo(g,h,i)perylene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Benzo(k)fluoranthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.1	0	<0.5	<0.5	0
Chrysene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.2	0	<0.5	<0.5	0
Dibenz(a,h)anthracene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Fluoranthene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.8	**46**	<0.5	<0.5	0	<0.5	0.4	0	<0.5	<0.5	0
Fluorene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.1	0	5.7	7.5	27
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<0.5	0
Naphthalene	mg/kg	1 (Primary): 1.3 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	5.0	**133**				<1.0	<0.1	0	<1.0	<0.5	0
Naphthalene	mg/kg	1 (Primary): 1.3 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	4.0	**120**	<1.0	<1.0	0	<1.0	<0.1	0	<1.0	<0.5	0
Naphthalene	mg/kg	0.5 (Primary): 1.3 (Interlab)	<0.5	<0.5	0	0.6	0.5	18	<0.5	1.6	**105**	<0.5	<0.5	0	<0.5	<0.1	0	0.7	<0.5	**33**
Phenanthrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.7	**33**	<0.5	<0.5	0	<0.5	0.3	0	10.3	14.0	**30**
Pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.7	**33**	<0.5	<0.5	0	<0.5	0.4	0	1.9	1.8	5
PAHs (Sum of Total)	mg/kg	0.5 (Primary): 4 (Interlab)	<0.5	<0.5	0	0.6	0.5	18	<0.5	3.8	**153**	<0.5	<0.5	0	<0.5	2.7	**138**	18.6	79.0	**124**
Phenols																		
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
3-&4-methylphenol	mg/kg	1	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0						
4-chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
Phenol	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0						
Pentachlorophenol	mg/kg	2	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<2.0	0						
Metals																		
Arsenic	mg/kg	5 (Primary): 3 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<15.0	0	6.0	3.0	**67**
Cadmium	mg/kg	1 (Primary): 1.5 (Interlab)	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<1.5	0	<1.0	<0.3	0
Chromium (III+VI)	mg/kg	2 (Primary): 1.5 (Interlab)	10.0	11.0	10	38.0	27.0	**34**	5.0	7.0	**33**	17.0	17.0	0	14.0	7.0	**67**	37.0	21.0	**55**
Copper	mg/kg	5 (Primary): 2.5 (Interlab)	<5.0	<5.0	0	8.0	7.0	13	<5.0	<5.0	0	12.0	14.0	15	<5.0	2.9	0	8.0	8.3	4
Lead	mg/kg	5 (Primary): 1 (Interlab)	9.0	10.0	11	19.0	30.0	**45**	31.0	46.0	**39**	14.0	14.0	0	12.0	10.0	18	34.0	37.0	8
Mercury	mg/kg	0.1 (Primary): 0.01 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.01	0	<0.1	<0.01	0

Table T5 - QA/QC

Sample_Type	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Interlab_D	RPD	Primary	Interlab_D	RPD
Field_ID	S7	QC1		S14	QC3		SP4	QC4		SOB1	OBQA1		S9	QC2		SP9	QC5	
Sampled_Date	27/08/2014	27/08/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014		4/09/2014	4/09/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014	
ChemName	**Units**	**LOR**																
Nickel	mg/kg	2 (Primary): 2.5 (Interlab)	5.0	6.0	18	9.0	10.0	11	3.0	4.0	29	8.0	8.0	0	8.0	4.0	**67**	8.0	6.8	16
Zinc	mg/kg	5 (Primary): 2.5 (Interlab)	18.0	22.0	20	30.0	57.0	**62**	36.0	39.0	8	58.0	57.0	2	31.0	20.0	**43**	84.0	99.0	16
Chlorinated Hydrocarbons																				
1,1,1,2-tetrachloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1,1-trichloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1,2,2-tetrachloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1,2-trichloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1-dichloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1-dichloroethene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,1-dichloropropene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2,3-trichloropropane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2-dibromo-3-chloropropane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2-dichloroethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2-dichloropropane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,3-dichloropropane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
2,2-dichloropropane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Bromodichloromethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Bromoform	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Carbon tetrachloride	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Chlorodibromomethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Chloroethane	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
Chloroform	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
cis-1,2-dichloroethene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
cis-1,3-dichloropropene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Dibromomethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Hexachlorobutadiene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Trichloroethene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Tetrachloroethene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
trans-1,2-dichloroethene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
trans-1,3-dichloropropene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Vinyl chloride	mg/kg	5 (Primary): 0.5 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<0.1	0	<5.0	<0.5	0
Halogenated Benzenes																				
1,2,3-trichlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2,4-trichlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,2-dichlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,3-dichlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
1,4-dichlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
2-chlorotoluene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
4-chlorotoluene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Bromobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Chlorobenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Hexachlorobenzene	mg/kg	0.05										<0.05	<0.05	0						
Halogenated Hydrocarbons																				
1,2-dibromoethane	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Bromomethane	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
Chloromethane	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
Dichlorodifluoromethane	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
Iodomethane	mg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<5.0	0	<0.5	<25.0	0
Trichlorofluoromethane	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
MAH																				
1,2,4-trimethylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	1.3	<0.5	**89**	1.7	20.0	**169**				<0.5	<0.1	0	8.4	7.8	7
1,3,5-trimethylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	0.5	5.1	**164**				<0.5	<0.1	0	3.5	2.3	**41**
Isopropylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
n-butylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	0.8	**46**				<0.5	<0.1	0	0.7	<0.5	**33**
n-propylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	2.0	**120**				<0.5	<0.1	0	<0.5	<0.5	0
p-isopropyltoluene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	0.6	<0.5	18
sec-butylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	0.5	<0.5	0
Styrene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
tert-butylbenzene	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.1	0	<0.5	<0.5	0
Organochlorine Pesticides																				
4,4-DDE	mg/kg	0.05										<0.05	<0.05	0						
a-BHC	mg/kg	0.05										<0.05	<0.05	0						
Aldrin	mg/kg	0.05										<0.05	<0.05	0						
Aldrin + Dieldrin	mg/kg	0.05										<0.05	<0.05	0						
b-BHC	mg/kg	0.05										<0.05	<0.05	0						

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Table T5 - QA/QC

Client Name: Justice and Community Safety Directorate
Project Name: Charnwood UPSS Validation Report
Project No: 60316172

Sample_Type	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Field_D	RPD	Primary	Interlab_D	RPD	Primary	Interlab_D	RPD
Field_ID	S7	QC1		S14	QC3		SP4	QC4		SOB1	OBQA1		S9	QC2		SP9	QC5	
Sampled_Date	27/08/2014	27/08/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014		4/09/2014	4/09/2014		27/08/2014	27/08/2014		27/08/2014	27/08/2014	
ChemName	**Units**	**LOR**																
chlordane	mg/kg	0.05								<0.05	<0.05	0						
Chlordane (cis)	mg/kg	0.05								<0.05	<0.05	0						
Chlordane (trans)	mg/kg	0.05								<0.05	<0.05	0						
d-BHC	mg/kg	0.05								<0.05	<0.05	0						
DDD	mg/kg	0.05								<0.05	<0.05	0						
DDT	mg/kg	0.2								<0.2	<0.2	0						
DDT+DDE+DDD	mg/kg	0.05								<0.05	<0.05	0						
Dieldrin	mg/kg	0.05								<0.05	<0.05	0						
Endosulfan	mg/kg	0.05								<0.05	<0.05	0						
Endosulfan I	mg/kg	0.05								<0.05	<0.05	0						
Endosulfan II	mg/kg	0.05								<0.05	<0.05	0						
Endosulfan sulphate	mg/kg	0.05								<0.05	<0.05	0						
Endrin	mg/kg	0.05								<0.05	<0.05	0						
Endrin aldehyde	mg/kg	0.05								<0.05	<0.05	0						
Endrin ketone	mg/kg	0.05								<0.05	<0.05	0						
g-BHC (Lindane)	mg/kg	0.05								<0.05	<0.05	0						
Heptachlor	mg/kg	0.05								<0.05	<0.05	0						
Heptachlor epoxide	mg/kg	0.05								<0.05	<0.05	0						
Methoxychlor	mg/kg	0.2								<0.2	<0.2	0						
Organophosphorous Pesticides																		
Azinophos methyl	mg/kg	0.05								<0.05	<0.05	0						
Bromophos-ethyl	mg/kg	0.05								<0.05	<0.05	0						
Carbophenothion	mg/kg	0.05								<0.05	<0.05	0						
Chlorfenvinphos	mg/kg	0.05								<0.05	<0.05	0						
Chlorpyrifos	mg/kg	0.05								<0.05	<0.05	0						
Chlorpyrifos-methyl	mg/kg	0.05								<0.05	<0.05	0						
Diazinon	mg/kg	0.05								<0.05	<0.05	0						
Dichlorvos	mg/kg	0.05								<0.05	<0.05	0						
Dimethoate	mg/kg	0.05								<0.05	<0.05	0						
Ethion	mg/kg	0.05								<0.05	<0.05	0						
Fenthion	mg/kg	0.05								<0.05	<0.05	0						
Malathion	mg/kg	0.05								<0.05	<0.05	0						
Methyl parathion	mg/kg	0.2								<0.2	<0.2	0						
Monocrotophos	mg/kg	0.2								<0.2	<0.2	0						
Prothiofos	mg/kg	0.05								<0.05	<0.05	0						
Other Pesticides																		
Demeton-S-methyl	mg/kg	0.05								<0.05	<0.05	0						
Fenamiphos	mg/kg	0.05								<0.05	<0.05	0						
Parathion	mg/kg	0.2								<0.2	<0.2	0						
Pirimphos-ethyl	mg/kg	0.05								<0.05	<0.05	0						
Polychlorinated Biphenyls																		
PCBs (Sum of Total)	mg/kg	0.1								<0.1	<0.1	0						
Solvents																		
Methyl Ethyl Ketone	mg/kg	5 (Primary): 50 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<10.0	0	<5.0	<50.0	0
2-hexanone (MBK)	mg/kg	5 (Primary): 25 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<5.0	0	<5.0	<25.0	0
4-Methyl-2-pentanone	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<1.0	0	<5.0	<5.0	0
Carbon disulfide	mg/kg	0.5 (Primary): 2.5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<2.5	0
Vinyl acetate	mg/kg	5 (Primary): 50 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0				<5.0	<10.0	0	<5.0	<50.0	0
VOCs																		
cis-1,4-Dichloro-2-butene	mg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<1.0	0	<0.5	<5.0	0
Pentachloroethane	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0									
trans-1,4-Dichloro-2-butene	mg/kg	0.5 (Primary): 5 (Interlab)	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0				<0.5	<1.0	0	<0.5	<5.0	0

Notes:

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (0-10 x EQL); 30 (10-20 x EQL); 30 (> 20 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

Appendix C

QAQC and Laboratory Certificates

Appendix C – Data Validation

1.0 Introduction

The following sections describe the components of the Quality Assurance by consideration of the data quality indicators – DQIs (precision, accuracy, reproducibility, completeness and comparability).

Specification of the acceptable limits on decision errors will be achieved by reference to the PARCC (precision, accuracy, representativeness, completeness and comparability) parameters as outlined below:

Precision

Precision measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques will be assessed by calculating the Relative Percentage Difference (RPD) of duplicate (laboratory and field) samples. The criteria to be used for the assessment of RPD are based on guidelines given in *Australian Standard AS4482.1* (1997). An RPD of less than 50% has been adopted for the assessment of field and laboratory precision.

If duplicate results exceed the acceptable RPD, investigation into the cause will be initiated. The results of the investigations will be written up and followed up with the laboratories to achieve resolution. Thus the precision of the laboratory will be assessed by the acceptability of the RPD of laboratory duplicate samples, which should be within the acceptable RPD limits as established for intra-laboratory and inter-laboratory duplicates.

Accuracy

Accuracy measures the bias in measurement. Accuracy can be impacted by factors such as field contamination of samples, poor preservation of samples, poor sample preparation techniques and poor selection of analysis techniques by the analysing laboratory and improper analyses.

The accuracy of the laboratory data generated during the project is a measure of the closeness of the analytical results obtained by a method to the 'true' value. For reference laboratory methods (e.g. USEPA methods), the following levels of accuracy should generally be achievable within ± 15 % of:

- The expected value of a certified reference material of similar matrix; or
- The value obtained by a separately validated and recognised quantitative method for the sample matrix.

Accuracy will be assessed by:

- Reference to the analytical results of laboratory control samples;
- Use of trip, equipment and field blanks to check the accuracy of sampling techniques; and
- Evaluating the results of laboratory spikes and analyses against reference standards.

Analytical results of these should be sufficient to establish that accuracy has been achieved in the work of the sampling personnel.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness will be achieved by collecting soil and groundwater samples from across the Site. The soil and groundwater monitoring QA/QC will assess whether concentrations of CoPC have been maintained in the samples during and after their collection. Consistent techniques and methods using written procedures will be utilised throughout the sampling program.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being a sufficient amount of valid data generated during the monitoring works. If there are insufficient valid data, as determined by the other DQIs, then additional data is collected.

Comparability

Comparability is a qualitative parameter, expressing the confidence with which one data set can be compared with another. This will be achieved through maintaining a level of consistency in techniques used to collect

samples, and ensuring the selected laboratories use consistent analytical techniques and reporting methods. Reporting of results will be done in consistent units and nomenclatures, and comparability will be achieved by ensuring that precision and accuracy objectives are met.

2.0 Data Quality Indicators

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

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

Table 1 Data Quality Indicators

DQI	Field	Laboratory	Acceptability Limits
Completeness	All critical locations sampled All samples collected (from grid and depth) SOPs appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to SAQP Appropriate methods Appropriate LORs Sample documentation complete Sample holding times complied with	As per NEPC (2013) < nominated criteria As per NEPC (2013)
Comparability	Sample SOPs used on each occasion Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used (including clean-up) Sample LORs (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (2013) < nominated criteria
Representativeness	Appropriate media sampled according to SAQP All media identified in SAQP sampled	All samples analysed according to SAQP	
Precision	SOPs appropriate and complied with Collection of blind and split duplicate samples	Analysis of: Blind duplicate samples (1 in 20 samples) Split duplicate samples (1 in 20 samples) Laboratory duplicate sample	RPD of < 50% RPD of < 50% RPD of < 50%
Accuracy	SOPs appropriate and complied with Collection of rinsate blanks	Analysis of: Field/trip blanks (1/day) Rinsate blanks (1/day/equipment) Method blanks Matrix spikes Matrix spike duplicates Surrogate spikes Laboratory control samples Laboratory prepared spikes Reagent blanks Reference materials	Non-detect for CoPC Non-detect for CoPC Non-detect for CoPC 70 to 130% RPD of <30% 70 to 130% 70 to 130 % 70 to 130% Non-detect for CoPC Varies

All reporting must comply with NSW EPA (2011) *Guidelines for Consultants Reporting on Contaminated Sites.*

3.0 Field QA/QC

3.1 Sampling Team

The soil, groundwater and sediment sampling program was undertaken by [redacted], a suitably qualified and experienced AECOM Environmental Scientists.

3.2 Sample Collection

3.2.1 Soils – Validation Samples

Soil samples were collected on 27 August 2014. Soil samples were collected by gloved hand from the centre of the excavator bucket.

3.3 Sample Handling and Preservation

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

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

Table 2 Sample Handling and Preservation

Matrix	Analyte	Container	Preservation
Soil	All analytes	250 mL Glass screw top jar	Unpreserved, 4°C
	Asbestos	Ziplock 500 mL bag	Unpreserved

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

3.4 Calibration

3.4.1 PID

During the field investigation calibration of the photoionisation detector (PID) was undertaken in accordance with manufacturer's instructions. The PID was calibrated prior to delivery by the supplier (Airmet) and at least once daily (at the start of each sampling day) with 100 ppm of isobutylene. All calibration results were satisfactory. Details of calibration are provided in **Appendix E**.

3.5 Field Intra and Inter-Duplicate Samples

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

The field duplicate samples were collected at the same time and adopting the same sampling methodology and sampling vessels as the primary groundwater samples.

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

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

$$RPD = \frac{|D1-D2|}{} \times 100$$

(D1+D2)/2

where D1 is the primary sample measurement

D2 is the duplicate sample measurement

RPDs for groundwater duplicate samples were compared to criteria presented in the **Table 1** above. The field duplicate and corresponding primary sample results and calculated RPDs are presented in **Table T5** in **Appendix B**.

The following tables provide a summary of the field duplicate samples analysed and the RPD results which exceeded the DQO:

Table 3 Soil Duplicate Sample Pair RPD Exceedances

Sample Pair	Duplicate Type	Analytes
S14/QC3	Intra-lab Duplicate	Toluene (46%) Xylene (105%) 1,2,4-trimethylbenzene (89%)
SP4/QC4	Intra-lab Duplicate	Toluene (145%) Ethylbenzene (159%) Xylene (158%) TRH C6-C10 (169%) Naphthalene (120%) 1,2,4-trimethylbenzene (169%) 1,3,5-trimethylbenzene (164%)
SP9/QC5	Inter-lab Duplicate	TRH C6-C10 (100%) Anthracene (89%) Total PAHs (124%) Arsenic (67%)

The RPD exceedences in the soil samples are likely to be a result of the heterogeneous nature of fill material rather than laboratory inaccuracies. Additionally, the contaminant concentrations between the primary and duplicate samples are in the same order of magnitude. Overall, the RPD exceedances are not considered to affect the validity of the data.

The intra laboratory duplicate sample frequency for this investigation was 3 duplicates to 29 primary soil samples. This met DQO of minimum 1 to 20 blind duplicate to primary samples.

The inter laboratory (split) duplicate sample frequency for this investigation was 2 duplicates to 29 primary soil samples. This sample frequency met the DQO of minimum 1 to 20 actual duplicate to primary samples.

RPD calculations are provided in **Tables T5**, **Appendix B**.

9212

48 HR TAT - As per Phone.
29/8/14 11:00

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Form: 1 of 4

Chain of Custody & Analysis Request Form

AECOM - Canberra
Level 2, 60 Marcus Clarke Street
Canberra, ACT 2600
Tel: 02 6201 3000
Fax: 02 6201 3099
Email: [redacted]aecom.com

Laboratory Details
Lab. Name: ALS Sydney
Lab. Address: Smithfield
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/13

Project Name: ESA Charnwood
Project Number: 60316172
Purchase Order Number: Project 60316172, Task No. 1.1

Sample collected by: [redacted]
Sample Results to be returned to: ALS Sydney

Specifications:

	(Tick)		
1. Urgent TAT required? (please circle: 24hr (48hr) ____days) STANDARD	☑ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☑ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☑ N/A
4. Special storage requirements?	☐ Yes	☐ No	☑ N/A
5. Preservation requirements?	☐ Yes	☐ No	☑ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☑ N/A

7. Report Format: 8. Project Manager: tel:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TPH	BTEX	PAH	Phenols (Total)	Heavy Metals (8)	VOCs
1	S1	27/08/2014		√					√		Jar	√	√	√	√	√	√
2	S2	27/08/2014		√					√		Jar	√	√	√	√	√	√
3	S3	27/08/2014		√					√		Jar	√	√	√	√	√	√
4	S4	27/08/2014		√					√		Jar	√	√	√	√	√	√
5	S5	27/08/2104		√					√		Jar	√	√	√	√	√	√
6	S6	27/08/2014		√					√		Jar	√	√	√	√	√	√
7	S7	27/08/2014		√					√		Jar	√	√	√	√	√	√
8	S8	27/08/2014		√					√		Jar	√	√	√	√	√	√
9	S9	27/08/2014		√					√		Jar	√	√	√	√	√	√
10	S10	27/08/2014		√					√		Jar	√	√	√	√	√	√

Remarks & comments

TAT

Sub-con / Forward Lab / Split WO
Lab / Analysis: SGS / QES
Organised By / Date: ASET / Asbestos
Relinquished By / Date: 29-8-14
Consignee / Courier:
WO No:
Attach By PO / Internal Sheet:

Relinquished By:	Received by:	Received in good condition?	Yes/No/NA	Method of Shipment
[redacted] Date: 27/08/2014	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: AECOM Time: 14:00	of: Time:		Yes/No/NA	Transport Co:
Relinquished By:	**Received by:**	Received in good condition?	Yes/No/NA	Method of Shipment
Name: Date:	Name: Date:	Samples received chilled?	Yes/No/NA	Consignment Note No.
of: Time:	of: Time:		Yes/No/NA	Transport Co:

Environmental Division Sydney
Work Order
ES1419212

Telephone : +61-2-8784 8555

Environment

Form: 2 of 4

AECOM

Chain of Custody & Analysis Request Form

AECOM - Canberra
Level 2, 60 Marcus Clarke Street
Canberra, ACT 2600
Tel: 02 6201 3000
Fax: 02 6201 3099
Email: [redacted]

Laboratory Details
Lab. Name: ALS Sydney
Lab. Address: Smithfield
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/13

Project Name: ESA Charnwood **Project Number:** 60316172 **Purchase Order Number:** Project 60316172, Task No. 1.1

Sample collected by: [redacted] **Sample Results to be returned to:** ALS Sydney

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr _____days) STANDARD	☑ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☑ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☑ N/A
4. Special storage requirements?	☐ Yes	☐ No	☑ N/A
5. Preservation requirements?	☐ Yes	☐ No	☑ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☑ N/A
7. Report Format: 8. Project Manager:			tel:

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix			Preservation				Container	Analysis Request														Remarks & comments
				soil	water	other	filted	acid	ice	other	(No. & type)	TPH	BTEX	PAH	Phenols (Total)	Heavy Metals (8)	VOCs									Please send to SGS Sydney	
11	S11	27/08/2014		√					√		Jar	√	√	√	√	√	√										
12	S12	27/08/2014		√					√		Jar	√	√	√	√	√	√										
13	S13	27/08/2014		√					√		Jar	√	√	√	√	√	√										
14	S14	27/08/2014		√					√		Jar	√	√	√	√	√	√										
15	S15	27/08/2104		√					√		Jar	√	√	√	√	√	√										
16	S16	27/08/2014		√					√		Jar	√	√	√	√	√	√										
17	S17	27/08/2014		√					√		Jar	√	√	√	√	√	√										
18	S18	27/08/2014		√					√		Jar	√	√	√	√	√	√										
19	QC1	27/08/2014		√					√		Jar	√	√	√	√	√	√										
20	QC2	27/08/2014		√					√		Jar	√	√	√	√	√	√									√	

Relinquished By:
[redacted] Date: 27/08/2014
of: AECOM Time: 14:00

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Relinquished By:
Name: Date:
of: Time:

Received by:
Name: Date:
of: Time:

Received in good condition?	Yes/No/NA	Method of Shipment	☐ Courier ☐ Postal ☐ By Hand
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

Form: 3 of 4

AECOM

Chain of Custody & Analysis Request Form

AECOM - Canberra
Level 2, 60 Marcus Clarke Street
Canberra, ACT 2600
Tel: 02 6201 3000
Fax: 02 6201 3099
Email: [redacted]@aecom.com

Laboratory Details
Lab. Name: ALS Sydney
Lab. Address: Smithfield
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/13

Project Name: ESA Charnwood **Project Number:** 60316172 **Purchase Order Number:** Project 60316172, Task No. 1.1

Sample collected by: [redacted] **Sample Results to be returned to:** ALS Sydney

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr (48hr) ____days) STANDARD	☑ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☑ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☑ N/A
4. Special storage requirements?	☐ Yes	☐ No	☑ N/A
5. Preservation requirements?	☐ Yes	☐ No	☑ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☑ N/A
7. Report Format: 8. Project Manager:			tel:

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TPH	BTEX	PAH	Phenols (Total)	Heavy Metals (8)	VOCs	Asbestos	Remarks & comments
21	SP1	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
22	SP2	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
23	SP3	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
24	SP4	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
25	SP5	27/08/2104		√					√		Jar	√	√	√	√	√	√	√	
26	SP6	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
27	SP7	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
28	SP8	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
29	SP9	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	
30	SP10	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	

Relinquished By: [redacted] Date: 27/08/2014 Time: 14:00 of: AECOM

Received by: Name: Date: Time: of:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Relinquished By: Name: Date: Time: of:

Received by: Name: Date: Time: of:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA
Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Form: 4 of 4

AECOM

Chain of Custody & Analysis Request Form

AECOM - Canberra
Level 2, 60 Marcus Clarke Street
Canberra, ACT 2600
Tel: 02 6201 3000
Fax: 02 6201 3099
Email: [redacted]@aecom.com

Laboratory Details
Lab. Name: ALS Sydney
Lab. Address: Smithfield
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: EN/004/13

Project Name: ESA Charnwood **Project Number:** 60316172 **Purchase Order Number:** Project 60316172, Task No. 1.1

Sample collected by: [redacted] **Sample Results to be returned to:** ALS Sydney

Specifications:	(Tick)		
1. Urgent TAT required? (please circle: 24hr (48hr) ____days) STANDARD	☑ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☐ Yes	☐ No	☑ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☑ N/A
4. Special storage requirements?	☐ Yes	☐ No	☑ N/A
5. Preservation requirements?	☐ Yes	☐ No	☑ N/A
6. Other requirements? ☐ Fax ☐ Hard copy ☑ Email	☐ Yes	☐ No	☑ N/A
7. Report Format: 8. Project Manager:			tel:

Lab. ID	Sample ID	Sampling Date	Sampling Time	Matrix: soil	Matrix: water	Matrix: other	Preservation: frit'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	TPH	BTEX	PAH	Phenols (Total)	Heavy Metals (8)	VOCs	Asbestos	Please send to SGS Sydney	Remarks & comments
31	SP11	27/08/2014		√					√		Jar	√	√	√	√	√	√	√		
32	QC3	27/08/2014		√					√		Jar	√	√	√	√	√	√			
33	QC4	27/08/2014		√					√		Jar	√	√	√	√	√	√	√		
[redacted]	QC5	27/08/2014		√					√		Jar	√	√	√	√	√	√	√	√	
34	PW	27/08/2014			√				√		2 x vials, plastic and amber	√	√	√	√	√				

Relinquished By: [redacted] Date: 27/08/2014 Time: 14:00 of: AECOM

Received by: Name: Date: Time: of:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA Yes/No/NA
Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

Relinquished By: Name: Date: Time: of:

Received by: Name: Date: Time: of:

Received in good condition? Yes/No/NA
Samples received chilled? Yes/No/NA Yes/No/NA
Method of Shipment ☐ Courier ☐ Postal ☐ By Hand
Consignment Note No.
Transport Co:

ALS Group

Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order	: **ES1419212**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: Client Services
Address	: LEVEL 2 60 MARCUS CLARKE ST CANBERRA ACT, AUSTRALIA 2600	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]@aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 6201 3017	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 60316172 TASK No 1 1 ESA CHARNWOOD	Page	: 1 of 3
Order number	: 60316172		
C-O-C number	: ----	Quote number	: ES2014HLAENV0523 (EN/004/14)
Site	: ----		
Sampler	: ----	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Dates

Date Samples Received	: 29-AUG-2014	Issue Date	: 29-AUG-2014 13:21
Client Requested Due Date	: 02-SEP-2014	Scheduled Reporting Date	: **02-SEP-2014**

Delivery Details

Mode of Delivery	: Carrier	Temperature	: 1.5'C - Ice present
No. of coolers/boxes	: 2 HARD	No. of samples received	: 33
Security Seal	: Intact.	No. of samples analysed	: 33

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Samples QC2 and QC5 were sent to SGS as required**
- 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.

Issue Date	: 29-AUG-2014 13:21
Page	: 2 of 3
Work Order	: ES1419212
Client	: AECOM Australia Pty Ltd

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - ASB-SOL (Subcontracted) Asbestos - Count (Solid)	SOIL - EP074 (solids) Volatile Organic Compounds	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1419212-001	27-AUG-2014 15:00	S1		✓	✓
ES1419212-002	27-AUG-2014 15:00	S2		✓	✓
ES1419212-003	27-AUG-2014 15:00	S3		✓	✓
ES1419212-004	27-AUG-2014 15:00	S4		✓	✓
ES1419212-005	27-AUG-2014 15:00	S5		✓	✓
ES1419212-006	27-AUG-2014 15:00	S6		✓	✓
ES1419212-007	27-AUG-2014 15:00	S7		✓	✓
ES1419212-008	27-AUG-2014 15:00	S8		✓	✓
ES1419212-009	27-AUG-2014 15:00	S9		✓	✓
ES1419212-010	27-AUG-2014 15:00	S10		✓	✓
ES1419212-011	27-AUG-2014 15:00	S11		✓	✓
ES1419212-012	27-AUG-2014 15:00	S12		✓	✓
ES1419212-013	27-AUG-2014 15:00	S13		✓	✓
ES1419212-014	27-AUG-2014 15:00	S14		✓	✓
ES1419212-015	27-AUG-2014 15:00	S15		✓	✓
ES1419212-016	27-AUG-2014 15:00	S16		✓	✓
ES1419212-017	27-AUG-2014 15:00	S17		✓	✓
ES1419212-018	27-AUG-2014 15:00	S18		✓	✓
ES1419212-019	27-AUG-2014 15:00	QC1		✓	✓
ES1419212-021	27-AUG-2014 15:00	SP1	✓	✓	✓
ES1419212-022	27-AUG-2014 15:00	SP2	✓	✓	✓
ES1419212-023	27-AUG-2014 15:00	SP3	✓	✓	✓
ES1419212-024	27-AUG-2014 15:00	SP4	✓	✓	✓
ES1419212-025	27-AUG-2014 15:00	SP5	✓	✓	✓
ES1419212-026	27-AUG-2014 15:00	SP6	✓	✓	✓
ES1419212-027	27-AUG-2014 15:00	SP7	✓	✓	✓
ES1419212-028	27-AUG-2014 15:00	SP8	✓	✓	✓
ES1419212-029	27-AUG-2014 15:00	SP9	✓	✓	✓
ES1419212-030	27-AUG-2014 15:00	SP10	✓	✓	✓
ES1419212-031	27-AUG-2014 15:00	SP11	✓	✓	✓
ES1419212-032	27-AUG-2014 15:00	QC3		✓	✓
ES1419212-033	27-AUG-2014 15:00	QC4	✓	✓	✓

Issue Date	: 29-AUG-2014 13:21
Page	: 3 of 3
Work Order	: ES1419212
Client	: AECOM Australia Pty Ltd

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - W-27T TRH/BTEXN/PAH/Phenols/Total 8 Metals
ES1419212-034	27-AUG-2014 15:00	PW	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	ap_customerservice@aecom.com

MR[redacted]

- *AU Certificate of Analysis - NATA	Email	[redacted]@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep)	Email	[redacted]@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA	Email	[redacted]@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT	Email	[redacted]@aecom.com
- A4 - AU Tax Invoice	Email	[redacted]@aecom.com
- Attachment - Report (SUBCO)	Email	[redacted]@aecom.com
- Chain of Custody (CoC)	Email	[redacted]@aecom.com
- EDI Format - ENMRG	Email	[redacted]@aecom.com
- EDI Format - ESDAT	Email	[redacted]@aecom.com
- EDI Format - HLAPro	Email	[redacted]@aecom.com
- EDI Format - XTab	Email	[redacted]@aecom.com

MR[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]@aecom.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]@aecom.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]@aecom.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]@aecom.com
- A4 - AU Tax Invoice (INV)	Email	[redacted]@aecom.com
- Attachment - Report (SUBCO)	Email	[redacted]@aecom.com
- Chain of Custody (CoC) (COC)	Email	[redacted]@aecom.com
- EDI Format - ENMRG (ENMRG)	Email	[redacted]@aecom.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]@aecom.com
- EDI Format - HLAPro (HLAPro)	Email	[redacted]@aecom.com
- EDI Format - XTab (XTAB)	Email	[redacted]@aecom.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1419212**	Page	: 1 of 41
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: MR [redacted]	Contact	: Client Services
Address	: LEVEL 2 60 MARCUS CLARKE ST CANBERRA ACT, AUSTRALIA 2600	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]@aecom.com	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 6201 3017	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 60316172 TASK No 1 1 ESA CHARNWOOD	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: 60316172		
C-O-C number	: ----	Date Samples Received	: 29-AUG-2014
Sampler	: ----	Issue Date	: 02-SEP-2014
Site	: ----		
		No. of samples received	: 33
Quote number	: EN/004/14	No. of samples analysed	: 33

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	[redacted]	Sydney Inorganics
[redacted]	[redacted]	Sydney Inorganics
[redacted]	[redacted]	Sydney Organics
[redacted]	[redacted]	Sydney Inorganics

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **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.**
- **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.**

Page : 3 of 41
Work Order : ES1419212
Client : AECOM Australia Pty Ltd
Project : 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	S1	S2	S3	S4	S5
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
Compound	CAS Number	LOR	Unit		ES1419212-001	ES1419212-002	ES1419212-003	ES1419212-004	ES1419212-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		12.7	9.4	14.0	16.7	10.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	6	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		20	10	15	10	12
Copper	7440-50-8	5	mg/kg		7	7	<5	<5	10
Lead	7439-92-1	5	mg/kg		19	11	10	9	9
Nickel	7440-02-0	2	mg/kg		8	10	5	7	8
Zinc	7440-66-6	5	mg/kg		103	85	26	26	34
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	<5	<5	<5	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	S1	S2	S3	S4	S5
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
					ES1419212-001	ES1419212-002	ES1419212-003	ES1419212-004	ES1419212-005
EP074D: Fumigants - Continued									
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg		<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg		<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg		<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg		<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	<5	<5	<5	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order	: ES1419212
Client	: AECOM Australia Pty Ltd
Project	: 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	S1	S2	S3	S4	S5
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
Compound	CAS Number	LOR	Unit		ES1419212-001	ES1419212-002	ES1419212-003	ES1419212-004	ES1419212-005
EP074F: Halogenated Aromatic Compounds - Continued									
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : ES1419212
Client : AECOM Australia Pty Ltd
Project : 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	S1	S2	S3	S4	S5
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
					ES1419212-001	ES1419212-002	ES1419212-003	ES1419212-004	ES1419212-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		**120**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**120**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		**70**	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**70**	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		**70**	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order	: ES1419212
Client	: AECOM Australia Pty Ltd
Project	: 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	S1	S2	S3	S4	S5
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
					ES1419212-001	ES1419212-002	ES1419212-003	ES1419212-004	ES1419212-005
EP080: BTEXN - Continued									
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		94.8	81.5	91.7	91.1	84.1
Toluene-D8	2037-26-5	0.1	%		112	85.2	107	101	93.5
4-Bromofluorobenzene	460-00-4	0.1	%		96.6	86.0	98.4	95.6	89.7
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		104	112	116	114	107
2-Chlorophenol-D4	93951-73-6	0.1	%		101	95.8	104	98.9	90.9
2.4.6-Tribromophenol	118-79-6	0.1	%		64.1	63.1	64.4	67.7	59.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		85.9	86.6	91.1	91.0	84.1
Anthracene-d10	1719-06-8	0.1	%		95.6	103	106	108	99.6
4-Terphenyl-d14	1718-51-0	0.1	%		94.8	97.5	102	103	96.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		89.8	77.1	86.8	86.2	79.6
Toluene-D8	2037-26-5	0.1	%		94.4	83.5	90.7	85.4	79.0
4-Bromofluorobenzene	460-00-4	0.1	%		91.5	84.4	92.6	89.4	85.1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	S6	S7	S8	S9	S10
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
					ES1419212-006	ES1419212-007	ES1419212-008	ES1419212-009	ES1419212-010
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		24.8	13.6	9.4	14.0	11.4
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		20	10	7	14	20
Copper	7440-50-8	5	mg/kg		7	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg		12	9	8	12	10
Nickel	7440-02-0	2	mg/kg		9	5	4	8	10
Zinc	7440-66-6	5	mg/kg		18	18	33	31	46
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP074A: Monocyclic Aromatic Hydrocarbons									
Styrene	100-42-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074B: Oxygenated Compounds									
Vinyl Acetate	108-05-4	5	mg/kg		<5	<5	<5	<5	<5
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	<5	<5	<5	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : ES1419212
Client : AECOM Australia Pty Ltd
Project : 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	S6	S7	S8	S9	S10
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
Compound	CAS Number	LOR	Unit		ES1419212-006	ES1419212-007	ES1419212-008	ES1419212-009	ES1419212-010
EP074D: Fumigants - Continued									
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg		<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg		<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg		<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg		<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	<5	<5	<5	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID	S6	S7	S8	S9	S10
				Client sampling date / time	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
					ES1419212-006	ES1419212-007	ES1419212-008	ES1419212-009	ES1419212-010
EP074F: Halogenated Aromatic Compounds - Continued									
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074H: Naphthalene									
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

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Work Order : ES1419212
Client : AECOM Australia Pty Ltd
Project : 60316172 TASK No 1 1 ESA CHARNWOOD

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)

Compound	CAS Number	LOR	Unit	Client sample ID: S6	S7	S8	S9	S10
				Client sampling date / time: 27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00	27-AUG-2014 15:00
				ES1419212-006	ES1419212-007	ES1419212-008	ES1419212-009	ES1419212-010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	0.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	140	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	140	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	<50	80	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	80	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	80	<50
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5