DLA Environmental Services
A Pacific Environment company

Detailed Site Investigation

Landmark Square
Forest Road, Durham Street and Roberts Lane
Hurstville NSW 2220

Foresight Management

DL3959_S006470

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This report is limited to the scope defined herein. Sampling and chemical analysis of environmental media are based on representative samples, the intensity of those samples being in accordance with the usual levels of testing carried out for this type of investigation and appropriate for the objectives of this report. Due to the inherent variability in environmental media, DLA cannot warrant that the whole overall condition of the Site is identical or substantially similar to the representative samples.

ABBREVIATIONS

AEC	Areas of Environmental Concern
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
CSM	Conceptual Site Model
DBYD	Dial-Before-You-Dig
DDA	Due Diligence Assessment
DEC	Department of Environment and Conservation (NSW)
DLA	DLA Environmental Services
DO	Dissolved Oxygen
DP	Deposited Plan
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
EI	Environmental Investigations Australia Pty Ltd
EPA	Environment Protection Authority (NSW)
GIL	Groundwater Investigation Level
HIL	Health-Based Investigation Level
HSL	Health Screening Level
LEP	Local Environment Plan
LOR	Limit of Reporting
LR	Low Reliability
ML	Management Limit
MW	Monitoring Well
NA	Not Applicable
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NL	Non Limiting
NSW	New South Wales
OCP	Organochlorine Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PCOC	Potential Contaminants of Concern
PID	PhotoIonisation Detector
POEO	Protection of the Environment Operations
PSH	Phase Separated Hydrocarbon
PSI	Preliminary Site Investigation
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance and Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAC	Site Acceptance Criteria
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalence Quotient
TRH	Total Recoverable Hydrocarbons

UST	Underground Storage Tank
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

DLA Environmental Services was engaged by Foresight Management to conduct a Detailed Site Investigation of the parcel of land identified as **Landmark Square –** bound by Forest Road, Durham Street & Roberts Lane, Hurstville, NSW, 2220 (the Site).

The objectives of the Detailed Site Investigation were to identify potential sources of contamination and the contaminants of concern resulting from past and present site uses, evaluate the presence of contamination in the identified areas of concern and assess the suitability of the Site for its intended land use. In particular, this DSI provides conclusions regarding the suitability of the Site for future land use consistent with *Residential A* as described in the *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013* (No.1) (NEPC, 2013).

To achieve this objective, DLA Environmental Services carried out intrusive soil and groundwater sampling and laboratory analysis. This report should be read in conjunction with the Due Diligence Assessment report (DL3959_S005562, October 2016) prepared following the completion of investigations previously undertaken in accessible areas of the Site.

Previous investigations indicate that the Site has been occupied by a variety of land uses including a service station, bus depot, mechanical workshops, car wash and residential premises. Three underground storage tanks are known to be currently located on-site. Subsurface conditions beneath the Site typically comprise fill material underlain by residual clay and shale bedrock. Strong hydrocarbon odours and staining were identified in the fill material comprising the upper subsurface within boreholes BH8 and BH9 installed adjacent to a mechanical workshop at 120 Durham Street.

Soil samples reported elevated concentrations of volatile petroleum hydrocarbons (TRH C_6-C_{16}), naphthalene and organic compounds within the fill in boreholes BH8 and BH9. The results of the laboratory analysis indicate that the identified contamination extends into the residual clay soils underlying the fill. Cadmium and lead were also reported to exceed the adopted investigation criteria in the fill material to depths no greater than 0.8m below ground level. Statistical analysis of the identified contaminant indicates that both the petroleum hydrocarbons and heavy metals are not considered suitable to remain on-site under a high-density residential land use scenario.

Groundwater collected from monitoring well MW4 reported elevated concentrations of volatile petroleum hydrocarbons and organic compounds. These concentrations may be indicative of leakage from underground infrastructure, or may be representative of regional groundwater conditions. Copper and zinc were also reported to exceed the adopted investigation criteria. It is considered likely

that these concentrations are representative of background groundwater conditions associated with highly disturbed urban environments.

Based on the findings of this investigation, DLA Environmental Services concludes that the Site is not currently considered suitable for future residential land use from a contamination perspective. However, given that most of the subsurface of the Site will be excavated to create a basement car park, the identified areas of soil contamination will be removed as part of the Site redevelopment.

On the basis of the conclusions in this report, it is recommended that a Remediation Action Plan be developed in accordance with the relevant regulatory requirements to address the identified contamination issues and render the Site suitable for the proposed land use.

The Detailed Site Investigation concludes that the Site can be made suitable for the intended land use consistent with *Residential A – Residential with Gardens / Accessible soil* (NEPC, 2013) following implementation of the aforementioned recommendations.

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1.0 INTRODUCTION

1.1 General

DLA Environmental Services (DLA) was engaged by Foresight Management (the Client) to conduct a Detailed Site Investigation (DSI) of the parcel of land identified as:

Landmark Square – bound by Forest Road, Durham Street & Roberts Lane, Hurstville, NSW, 2220 (the Site).

The DSI report provides detailed information on the characterisation and environmental status of the Site and assesses the effects of any potential identified contamination on public health and the environment. The report has been prepared utilising information obtained as part of the assessment process, from previous assessment reports and from experience, knowledge, and current industry practice in the investigation of similar sites.

This report should be read in conjunction with the Due Diligence Assessment report ((DL3959_S005562, October 2016)) prepared following the completion of investigations previously undertaken in accessible areas of the Site.

1.2 Objectives

The objectives of this DSI were to identify potential sources of contamination and the contaminants of concern resulting from past and present site uses, evaluate the presence of contamination in the identified areas of concern and assess the suitability of the Site for its intended land use. In particular, this DSI provides conclusions regarding the suitability of the Site for future land use consistent with *Residential A* as described in the *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013* (No.1) ('NEPM', NEPC, 2013).

1.3 Scope of Works

To achieve this objective, DLA carried out the following works:

- Desktop review of previous environmental reports prepared for the Site;
- Review of the environmental conditions of the Site including topography, geology and hydrogeology;
- Inspection of accessible areas of the Site;

- Identification of potential contamination issues and Areas of Environmental Concern (AECs) at the Site;
- Systematic soil sampling based on identified AECs;
- Laboratory testing of selected soil samples for a range of potential organic and inorganic contaminants;
- Interpretation of the results of laboratory testing in the context of the Site history, field observations, local geology and hydrogeology, and the adopted Site Assessment Criteria; and,
- Assessment of contamination status of the Site, and provision of recommendations regarding further assessment, management or remediation works, if required.

2.0 SITE DESCRIPTION

2.1 Site Identification

The Site identification details are summarised in **Table 2a**.

Table 2a – Site Identification Summary

ITEMS	DETAILS
Site Name	Landmark Square
Address / Lot and Deposited Plan	53 Forest Road, Hurstville / Lot A DP 372835 61 Forest Road, Hurstville / Lot 1 DP 225302 67 Forest Road, Hurstville / Lot 101 DP 776275 71A Forest Road, Hurstville / Lot 100 DP 776275 73 Forest Road, Hurstville / Lot 10 DP 621395 75 Forest Road, Hurstville / Lots 3 & 4 DP 12517 108 Durham Street, Hurstville / Lot D DP 391801 110 Durham Street, Hurstville / Lot C DP 391801 112 Durham Street, Hurstville / Lot B DP 391801 114 Durham Street, Hurstville / Lot A DP 391801 116 Durham Street, Hurstville / Lot 5 DP 171179 118 Durham Street, Hurstville / Lot 2 DP 213685 118A Durham Street, Hurstville / Lot 1 DP 213685 120 Durham Street, Hurstville / Lot 1 DP 337499 122A Durham Street, Hurstville / Lot 15 DP 601341 126 Durham Street, Hurstville / Lots 1 & 2 DP 12517 9A Roberts Lane, Hurstville / Lot 1 DP 172819
Local Government Authority	Hurstville City Council
Land Zoning	All lots are zoned 'IN2 – Light Industrial' under the Hurstville Local Environment Plan (LEP) 2012, excluding Lot A DP 372835 (53 Forest Road) which is zoned 'R2 – Residential' under the Hurstville LEP 2012
Current Use	Mixed commercial uses, and low to medium density residential land use
Proposed Use	Rezoning and redevelopment consistent with *Residential A* as described in the NEPM (NEPC, 2013)
Site Area (approx.)	14,000 m^2 (1.4 ha)
Locality Map	Refer to **Figure 1** – Site Location

2.2 Proposed Development

Based on the information provided, it is understood that the Site is currently occupied by residential and mixed commercial land use including mechanical workshops, a car wash and retail premises, and is proposed to be rezoned from 'IN2 - Light Industrial' to 'B4 – Mixed Uses'.

Following rezoning, the Site will be redeveloped to include three multistorey mixed use buildings with two level basements. The buildings will be used for commercial and residential purposes and will include a childcare facility.

Given that a childcare centre is included in the redevelopment, the development scenario is consistent with the definition of 'Residential with gardens and accessible soil' provided in Schedule B7 of the NEPM (NEPC, 2013).

2.3 Site Description

The following Site description is based on visual observations of accessible areas during Site walkovers carried out by DLA on 10th October 2016 as part of a previous Due Diligence Assessment, and on 15th February 2017 as part of the current DSI.

The Site is a triangular-shaped parcel of land, bound by Forest Road to the west/north-west, Roberts Lane to the east/north-east, and Durham Street to the south. The northern portion of the Site (53 Forest Rd) is occupied by a two-storey residential apartment block and associated yard space.

The premises immediately south (61 Forest Rd) has a street frontage to both Forest Road and to Roberts Lane. The western half of the premises is occupied by a two-storey building fronting Forest Road containing retail showrooms (electrical wholesaler, carpet retailer) and warehousing, while the western half is occupied by a self-storage warehouse. The surface is sealed with concrete pavements which appear to be in good condition with no visible evidence of significant staining or damage. It is understood that an underground storage tank (UST) is located in the eastern half of this part of the Site, however no evidence of the tank was visible at the time of the Site walkover.

The premises further south (67 Forest Road) is occupied by two separate single storey mechanical workshops. The surface is sealed with concrete pavements which appear to be in good condition with no visible evidence of significant staining or damage.

The premises further south (71A Forest Rd) is occupied by a hand car wash. The surface is sealed with concrete pavements which appear to be in good condition no visible evidence of significant staining

or damage. It is understood that two USTs are present beneath the southwestern corner of this part of the Site, however no evidence of the tanks was visible at the time of the Site walkover. Given the topography of the Site, it was noted that the subsurface in the vicinity of the USTs has been filled to create a level platform for development.

A mechanical workshop is located immediately east of the car wash. Several individual workshops / sheds are located in this part of the Site, in addition to a UST fill point. The surface is sealed with bitumen pavements that were noted to be in average condition with several cracks, potholes and patched / repaired areas observed. The remainder of this part of the Site is used for vehicle access and car parking purposes.

A car dealership is located on the corner of Forest Road and Durham Street (75 Forest Rd) and comprises a two-storey building with vehicle access at the rear. An open, bitumen sealed car park is located to the east of the car dealership (126 Durham St).

Further to the east are two mechanical workshops (120 and 122a Durham St). The surface at both premises is sealed with concrete pavements which appear to be in good condition no visible evidence of significant staining or damage. It should be noted that access inside the mechanical workshops, within the car wash and the rear of the car dealership building was not possible at the time of the Site walkover, therefore the condition of internal pavements, and the presence of waste oil sumps, oil water separators and other potential sources of contamination, cannot be confirmed.

Further east is Durham Dry Cleaners (118A Durham St). The building comprises a single storey structure of concrete and brick construction that covers the southern half of the lot. The rear (northern) portion of the lot is the location of a large shed used as a chemical store. It is expected that the shed contains dry cleaning chemicals. An open yard with gardens and trees is located in the centre of the lot between the dry cleaners and the chemical store.

Adjacent to the eastern boundary of the dry cleaners is the St George and Sutherland Funeral Home (118 Durham St) which comprises a two-storey concrete and brick building that covers the entire southern and central areas of the lot. The rear (northern) portion of the lot comprises yard space with sheds. Further to the east is a martial arts centre (116 Durham St) which comprises a single storey brick building that covers the southern half of the lot, and yard space with an old shed within the northern half.

Further east is a two-storey commercial building (112-114 Durham St) that was previously used as a furniture warehouse and/or showroom. The building footprint covers the entire lot area, except for approximately 160m^2 of concrete hardstand in the southern portion and along the western boundary

used for vehicle and pedestrian access. The building was vacant at the time of the Site walkover (February 2017).

The property on the corner of Durham Street and Roberts Lane is occupied by a single storey residential building of brick construction. Given the expected age of the building, it is possible that asbestos may be present within the structure. The building covers the southern half of the lot and has been divided to create a duplex. A divided grass covered yard comprises the northern half of the lot.

Two separate commercial buildings of brick construction are located at 9 Roberts Lane. Both buildings are occupied by mechanical workshops and include concrete hardstand across the surface in both internal and external areas. Visual inspection of the workshops identified the presence of above ground hoists, chemical / product storage, and surface staining.

2.4 Boundaries and Surrounding Land Use

The boundary and surrounding landscape features of the Site are summarised in **Table 2b**.

Table 2b – Boundaries and Surrounding Land Use

DIRECTION	DETAILS
North	Junction of Forest Road and Roberts Lane, with Hurstville Public School beyond to the northwest and mixed commercial / high density residential land use beyond to the northeast
East	Roberts Lane, with low density residential land use beyond
South	Durham Street, with high density residential land use and a vacant block beyond. A sporting field is located beyond Durham St to the southeast
West	Forest Road, with commercial land use beyond, including a mechanical workshop

2.5 Topography

Google Earth 2016 indicates that the Site lies at elevations between 60m and 65m Australian Height Datum (AHD). The Site is relatively level however exhibits an overall gradient down towards the southwestern corner.

2.6 Site Geology and Soils

Review of the 1:100,000 *Sydney Geological Series Sheet 9130* indicates that the Site is underlain by Ashfield Shale of the Wianamatta Group. This formation comprises black to dark grey shale and laminite typically derived from lacustrine environments.

Review of the 1:100,000 *Sydney Soil Landscape Map* indicates that the subsurface of the Site comprises the Blacktown (residual) Soil Landscape Group which typically consists of shallow to moderately deep red and brown podzolic soils in well drained areas, and deep yellow brown podzolic soils and soloths in areas of poor drainage.

2.7 Acid Sulphate Soils

Review of the 1:25,000 *Botany Bay Acid Sulfate Soil Risk Map* indicates that there are no known occurrences of acid sulfate soils in the area.

2.8 Hydrology and Hydrogeology

No creeks or rivers surround or dissect the Site. The closest waterway to the Site is Poulton Creek which is located approximately 1.6km to the southwest. Poulton Creek flows in a southerly direction and discharges to Oatley Bay, which adjoins the Georges River.

The Georges River is located approximately 3km to the south of the Site, while Botany Bay is located approximately 4km to the east. Both waterways have the potential to affect the direction of groundwater flow beneath the Site.

Given that most of the surface of the Site is sealed with impervious pavements, infiltration of rainfall and surface water runoff is expected to be limited. Runoff water is expected to form overland flow and follow the gradient of the land, diverting towards the surrounding drainage systems on Forest Road and Durham Street.

The Site is located within the Botany Sands aquifer system. A search of the NSW Office of Water groundwater database was carried out to identify groundwater bores in the vicinity of the Site. The search identified nine registered bores within a 500m radius of the Site. Bore data is summarised in **Table 2c**.

Table 2c – Regional Groundwater Summary Data

WELL ID	DISTANCE, DIRECTON FROM SITE[1] (m)	PURPOSE	DEPTH (m bgl)	STANDING WATER LEVEL[2] (m bgl)	SALINITY (µS/cm)
GW102392	238m, S/SE	Monitoring	17.3	>5.3	Not recorded
GW102393	240m, S/SE	Monitoring	3.8	>0.8	Not recorded
GW102394	240m, SE	Monitoring	23.5	>7.0	Not recorded
GW102395	220m, SE	Monitoring	33.3	>26.8	Not recorded
GW102396	240m, SE	Monitoring	5.0	>1	Not recorded
GW102397	420m, SE	Monitoring	30.3	>23.8	Not recorded
GW102398	80m, S	Monitoring	33.3	>26.5	Not recorded
GW102407	355m, S	Monitoring	18.3	>11.8	Not recorded
GW102408	315m, S	Monitoring	24.3	>17.8	Not recorded

1 Distance and direction from a central point within the Site.
2 Standing water level (SWL) was not recorded, therefore SWL is based on the recorded depth of the well screen.
bgl – below ground level.

Previous intrusive investigations indicate that groundwater beneath the Site lies at depths between 1.8m and 6.82m bgl and is expected to flow in a north-easterly direction (DLA, 2016).

2.9 Sensitive Receptors

Potential human and environmental receptors located within an approximately 500m radius of the Site include:

- Hurstville Public School located to the north/northwest of the Site, immediately beyond Forest Road;
- Georges River College – Hurstville Boys Campus located immediately north of Hurstville Public School;
- Sydney Technical High School located approximately 400m to the northeast of the Site;
- Kempt Field located to the south of the Site, immediately beyond Durham Street;
- Woodville Park located approximately 175m to the west of the Site; and,
- Residential land use located on the eastern side of Roberts Lane, and 100m to the west of the Site.

3.0 SITE HISTORY

3.1 WorkCover Dangerous Goods Search

A search of the WorkCover NSW Stored Chemical Information Database by EI (2015) indicated that the following dangerous goods licences were registered for the Site:

- Dangerous Goods Licence 35/014901 pertaining to 61 Forest Road:
  - 1 x 5,000L UST for containing mineral spirits
- Dangerous Goods Licence 35/013585 pertaining to 71 Forest Road:
  - 1 x 5,000L UST containing petrol
  - 1 x 5,000L UST containing petrol

Records for 108-118 Durham Street or 9 Roberts Lane are still to be received by DLA.

Refer to **Appendix A** – Dangerous Goods Search.

3.2 Contaminated Land Record Search

A search of the NSW Environment Protection Authority (NSW EPA) 'Contaminated Land Record' and 'List of Contaminated Sites Notified to EPA' was carried out by DLA on 13 October 2016. The search indicated that the Site and surrounding properties are not encumbered by any notices issued by the NSW EPA under the *Contaminated Land Management Act 1997*.

3.3 POEO Search

A search of the NSW EPA *Protection of the Environment Operations* (POEO) *Act 1997* public register did not locate any records of licences, applications, notices, audits, or pollution studies/reduction programs for the Site or surrounding properties.

3.4 Site History Summary

The following Site history is based on information presented in previous assessment reports prepared for the Site.

53 Forest Road

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for residential purposes. No visible change to the layout of the property has occurred since 1943. Land title records indicate that this part of the Site has been privately owned since at least 1927.

61 Forest Road

Aerial photographs indicate that this part of the Site has been developed since at least 1930 for commercial purposes. Buildings located on-site appear to comprise warehouses and sheds.

Land title records indicate that this part of the Site previously comprised four separate allotments which were amalgamated in 1970. Prior to this, the allotments were owned by private individuals whose occupations included a blacksmith and a motor mechanic, and by corporations whose operations included a brewery, a bus depot, glaziers (glass and mirror fabrication), and storage. Land title records indicate that this portion of the Site has been used for retail and storage purposes since 1970.

67 Forest Road

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for commercial purposes.

Land title records indicate that this part of the Site previously comprised two separate allotments which were amalgamated in 2004. Prior to this, the allotments were privately owned by individuals whose occupations included a painter, car detailer and garage proprietor. From 1958 to 1976, ownership of the premises was held by Vacuum Oil Company Pty Ltd (which became Mobil Oil Australia) which was a service station operator. In 1976, ownership was transferred to Swanton's Car Market Pty Ltd for use as a car dealership.

71A Forest Road

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for commercial purposes.

Land title records indicate that this part of the Site previously comprised eight separate allotments which were amalgamated in 1988. Prior to this, the allotments were privately owned by individuals whose occupations included a painter, car dealer, garage proprietor and mechanic. From the late 1950s, ownership of the premises was held by Vacuum Oil Company Pty Ltd (Mobil Oil Australia), Tecoma Pty Ltd, and Swanton's Car Market Pty Ltd.

73 Forest Road

Aerial photographs indicate that this part of the Site has remained vacant land, potentially used for vehicle access to 71A Forest Road.

Land title records indicate that this part of the Site previously comprised five separate allotments which were amalgamated in 1982. Prior to this, the allotments were privately owned by individuals whose occupations included painter, car dealer and mechanic. From the late 1960s, ownership of the premises was held by Swanton's Car Market Pty Ltd.

75 Forest Road

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for commercial purposes.

Land title records indicate that this part of the Site was privately owned by individuals whose occupations included a lime merchant and garage proprietor. Ownership of the premises was also held by Shell Company of Australia Ltd between 1952 and 1961, and by South East Automotive Pty Ltd from 2011 to at least 2015.

108-110 Durham Street

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for residential purposes. Two structures were present in the 1943 photograph – one being a residential dwelling, the other a detached shed at the rear of the property. By 1961, the old shed had been removed and a new shed constructed east of the dwelling.

Land title records indicate that this part of the Site was privately owned by individuals whose occupations included a grocer and a builder. In 2005, ownership of 108 Durham Road was transferred to Bagi Pty Ltd which is understood to be a manufacturer of mattresses and bedsprings. Ownership of 110 Durham Road was transferred to Bagi Pty Ltd in 2006.

112-114 Durham Street

Aerial photographs indicate that this part of the Site was developed between 1930 and 1943 for residential purposes which included a residential dwelling and a detached shed at the rear. By 1986, a commercial warehouse had been constructed in the northern portion of the property, while the dwelling remained on the southern portion. By 2014, the residential dwelling had been removed and replaced with a commercial building.

Land title records indicate that this part of the Site was privately owned by individuals whose occupations included a grocer and a builder. In 1973, ownership of the premises was transferred to Bagi Pty Ltd.

116 Durham Street

Aerial photographs indicate that this part of the Site was developed prior to 1930 with the construction of a rectangular-shaped building. Sheds were constructed in the northern portion of the Site over the following years.

Land title records indicate that this part of the Site was privately owned. From 1937, ownership of the premises was held by The Boy Scouts Association of New South Wales.

118 Durham Street

Aerial photographs indicate that this part of the Site was developed prior to 1930 with the construction of a square-shaped building. An additional structure occupied the northern part of the property by 1951.

Land title records indicate that this part of the Site was privately owned until it was purchased by Durham Dry Cleaners Pty Ltd (now Lewis Court Pty Ltd) in 1954. Ownership was then transferred to Wood Coffill Funeral homes Pty Ltd in 1962 and private individuals in 1992.

118A Durham Road

Aerial photographs indicate that this part of the Site was developed prior to 1930 with the construction of a shed in the northern portion of the property. By 1943, a commercial building had been constructed in the southern half of the property.

Land title records indicate that this part of the Site was privately owned until it was purchased by Durham Dry Cleaners Pty Ltd (now Lewis Court Pty Ltd) in 1954. Ownership was then transferred to Wood Coffill Funeral homes Pty Ltd in 1962 and private individuals in 1967.

120 Durham Street

Aerial photographs indicate that this part of the Site was used for residential purposes until redevelopment for commercial purposes between 1961 and 1986.

Land title records indicate that this part of the Site has been privately owned since at least 1921 by individuals whose occupations included car detailer and a mechanic. The records further indicate that the land is currently leased to Speedway Auto Care Pty Ltd.

122A Durham Street

Aerial photographs indicate that this part of the Site was used for residential purposes until redevelopment for commercial purposes between 1961 and 1986.

Land title records indicate that this part of the Site previously comprised two separate allotments which were amalgamated in 1979. Prior to this, the allotments were privately owned by individuals whose occupations included a painter, car dealer and mechanic. From the late 1969s, ownership of the premises was held by Swanton's Car Market Pty Ltd, and is currently leased by A & C Motor Repairs Pty Ltd.

126 Durham Street

Aerial photographs indicate that this part of the Site was vacant and used for storage purposes by adjacent commercial premises until a commercial building was constructed between 1961 and 1986. By 2014, the building had been demolished and the premises was being used as a car park.

Land title records indicate that this part of the Site was privately owned by individuals whose occupations included a lime merchant and a mechanic. Ownership of the premises has been held by South East Automotive Pty Ltd from 2011 to date.

9 Roberts Lane

Aerial photographs indicate that this part of the Site was vacant except for one shed in the northern corner until development of the southern part of the premises for commercial purposes in 1961. By 1994, the northern shed had been removed and replaced by a commercial building.

Land title records indicate that this part of the Site has been privately owned by individuals whose occupations included a grocer, a builder, and manufacturers. The lot remains privately owned however has been leased to several businesses including David Arthur Smith (manufacturer), Woelms Pty Ltd (an automotive repairer) and Sunbeam Corporation Limited.

4.0 SUMMARY OF PREVIOUS INVESTIGATIONS

4.1 Preliminary Site Investigation (EIA, 2015, ref: E22665 AA_Rev 1)

The objective of the Preliminary Site Investigation (PSI) was to characterise the preliminary environmental conditions of the Site on the basis of historical land uses, anecdotal, and documentary evidence of possible pollutant sources.

The report indicated that the businesses operating on-site at the time of the PSI included mechanical workshops, a furniture workshop, storage and warehousing, offices, retailing shops and showrooms.

The following summarises the key findings from the PSI:

- The historical use of the Site was predominately commercial and industrial from the 1930s. Potentially contaminating activities occurring on-site were identified to be associated with use of the Site as a bus depot, glass manufacturing, a mechanical workshop, and a service station.
- WorkCover NSW records indicate that two USTs are present within 71 Forest Road, and one UST is present within at 61 – 65 Forest Road (refer to **Section 3.1** of this report for further details).
- A qualitative risk assessment undertaken for the Site identified a medium to high risk of the presence of subsurface contamination.

The following summarises the key conclusions and recommendations from the PSI:

- The condition of soil and groundwater underlying the Site was not expected to prevent re-zoning of the Site to B4 – Mixed Use.
- The suitability of the Site for the proposed mixed commercial and residential development should be assessed through intrusive investigations to quantify potential risks to human health and the environment associated with subsurface contamination.

4.2 Due Diligence Assessment (DLA, 2016, ref: DL3959_S005562)

The objective of the assessment was to undertake targeted intrusive investigations across the Site to assess the presence of subsurface contamination and to supplement the information presented in the PSI report (EI, 2015).

The scope of work included a review of historical data, intrusive fieldwork that included soil sampling from nine boreholes (BH1 to BH6, MW1 to MW3) and groundwater sampling from three monitoring wells (MW1 to MW3), and laboratory analysis.

A soil sample collected from fill in boreholes drilled between a tank fill point and a mechanical workshop (MW1_0.5m) reported volatile hydrocarbons and heavy metals at concentrations exceeding the adopted assessment criteria for residential land use.

Groundwater beneath the Site was recorded at depths between 1.8m and 6.82m below ground level and was expected to flow in a north-easterly direction.

Groundwater collected from monitoring wells MW1 and MW2 reported elevated concentrations of hydrocarbon-based contaminants which may be indicative of leakage from underground fuel tanks and associated pipework.

Heavy metals were also reported to exceed the adopted groundwater investigation levels, however these concentrations were considered to be representative of background conditions associated with highly disturbed urban environments.

The report concluded that the Site was not considered suitable for future residential land use from a contamination perspective due to elevated hydrocarbon and heavy metal concentrations within soil, and the presence of petroleum-based contamination in groundwater. On this basis, it was recommended that a Remediation Action Plan be developed to address the identified contamination issues and render the Site suitable for the proposed land use.

5.0 CONCEPTUAL SITE MODEL

5.1 Overview

A Conceptual Site Model (CSM) is a representation of an environmental system and the processes that determine the transport of contaminants from sources through environmental media to environmental receptors. The development of a CSM comprises an iterative process of characterising site contamination on the basis of historical, anecdotal, previous and current environmental data.

An exposure pathway is a means by which an ecosystem, human population or individual (receptor) may be exposed to site-derived contaminants. If a source, transport mechanism (pathway), an exposure point and a sensitive receptor are all present then a complete exposure pathway exists.

5.2 Potential Contaminants

On the basis of the information summarised above, the principal potential contamination sources and associated Potential Contaminants of Concern (PCOC) are summarised in Table 5a.

Table 5a – Contaminant Sources and PCOC

CONTAMINANT SOURCE	PCOC	RISK OF CONTAMINATION
USTs	TRH, BTEX, Lead	Moderate to High
Former / current use of the Site as service station / mechanical workshop	TRH, BTEX, PAH, heavy metals	Moderate
Current use of the site as a car wash	TRH, heavy metals, surfactants	Low to Moderate
Current and former operation of a dry-cleaning facility	VHCs	Moderate
Presence of fill material of unknown origin and quality	TRH, BTEX, PAH, OCP, PCB, heavy metals	Moderate
Weathering and demolition of hazardous building materials	Asbestos, lead	Low to Moderate

Heavy metals: As, Cd, Cr, Cu, Pb, Hg, Ni, Zn; TRH: Total Recoverable Hydrocarbons; BTEX: Benzene, Toluene, Ethylbenzene, Xylene; PAH: Polycyclic Aromatic Hydrocarbons; OCP: Organochlorine Pesticides; PCB: Polychlorinated Biphenyls; VHC: Volatile Halogenated Compounds.

5.3 Release and Transport Mechanisms

Contaminants generally migrate from a Site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and,
- The site topography, geology, hydrology and hydrogeology.

As most of the surface of the Site is sealed with impervious pavements, or covered by grass, the potential for windblown dust migration of contamination from the Site is considered minimal.

The potential for migration of contamination via infiltration of water into the subsurface, and subsequent migration through the soil profile, is also considered to be low given that most of the Site area is sealed. Areas of the Site that are grass covered have a higher potential for infiltration of water.

Due to the potential for release of petroleum from underground structures including USTs and associated fuel lines present on-site, migration of hydrocarbon-based contamination via groundwater movement is considered to be moderate to high.

In addition, there is also the potential for volatile hydrocarbon-based contaminants to be released to the environment as vapours.

5.4 Exposure Pathways

Based on the identified PCOCs, the exposure pathways for the Site's use include:

- Inhalation of vapours released from soil and groundwater impacted by volatile hydrocarbons;
- Ingestion of impacted soils in unsealed areas of the Site; and,
- Dermal and oral contact with impacted soils in unsealed areas of the Site.

5.5 Sensitive Receptors

The potential sensitive receptors of environmental impacts present at the Site include:

- Present and future occupants and users of the Site;
- Maintenance and construction workers conducting activities at the Site;

- Present and future occupants and users of neighbouring properties; and,
- Local terrestrial ecosystems including the parkland to the south of the Site.

6.0 SAMPLING AND ANALYSIS QUALITY PLAN

6.1 Data Quality Objectives

The NEPM (NEPC, 2013) and Australian Standard (AS) 4482.1-2005 recommend that data quality objectives (DQOs) be implemented during the investigation of contaminated sites. The DQO process described in AS 4482.1-*2005 Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds* outlines seven distinct steps to outline the project goals, decisions, constraints and an assessment of the project uncertainties and how to address these when they arise. The DQOs have been summarised in **Table 6a**.

Table 6a – Summary of DQOs

1	State the Problem	The objectives of this DSI are to identify potential sources of contamination and the contaminants of concern resulting from past and present site uses. Therefore, the main problems are: - How many boreholes should be drilled and where? - How many groundwater monitoring wells should be installed and where? - Are there access restrictions present that may affect the location of boreholes and groundwater wells, and the method(s) used for drilling and installation? - To what depths should the boreholes and groundwater wells be drilled? - At what depths should soil samples be collected? - What are the contaminants of potential concern for the relevant media?
2	Identify the Decisions	– Does historical information indicate a potential for contamination to be present at the Site? – Do contaminant concentrations in the soil and groundwater comply with the stated screening levels? – Do soils and groundwater underlying the Site currently require any remedial action / risk management? – Have the previous land uses affected the environmental quality of the land? – Are there any identifiable risks to human health or the environment on-site?
3	Identify Inputs to Decisions	– Information obtained from appropriate desktop searches to identify recorded history of detrimental effects on the site. – Results of judgemental soil and soil vapour sampling across the Site. – Relevant legislation and regulatory guidance.

4	Define Study Boundaries	Spatial boundaries: The physical study will focus on fill materials and natural soils within the confines of the proposed redevelopment boundary identified in **Figure 1** and **Figure 2**. Temporal boundaries: As data from previous investigations will be relied upon for the purposes of the investigation, then the temporal boundary of the assessment will be from August 2015 to date.
5	Develop Decision Rule	The Site will be considered suitable for its intended land use if contaminant concentrations within soils and groundwater underlying the Site comply with the adopted Site Assessment Criteria (SAC) as determined by the following decision rules being applied to the data: – The individual contaminant concentration should not exceed the SAC by more than 250% (this constitutes a 'hotspot' of contamination); and, – The standard deviation of individual contaminants should not exceed 50% of the SAC.
6	Specify Limits on Decision Errors	A Site under investigation is assumed to be contaminated until statistically proven otherwise (eg: Ho= Analyte 95% UCL exceeds the SAC), therefore two types of error are possible: - Type 1 error (α or false negative), where the Site is assessed to be uncontaminated when it is actually is; and, - Type 2 error (β or false positive), when the Site is assessed to be contaminated though is actually not. The more severe consequence is with Type 1 errors (α) since the risk of jeopardising human or environmental health outweighs the consequences of additional remediation costs. Therefore, to achieve appropriate confidence in the data, probabilities are set at 5% for Type 1 error, whilst Type 2 errors are set at a 20% probability limit. Field and laboratory quality controls are implemented to avoid error and to ensure the action levels exceed the measurement detection limits. The performance of decision making inputs will be enhanced through the application of Data Quality Indicators (DQI), defined in **Table 6b** below.
7	Optimise Design for Obtaining Data	– Ensure access to all relevant and previous environmental data. – Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs and avoid Type 1 and Type 2 errors.

Table 6b – Summary of DQIs

DATA PRECISION AND ACCURACY	
Acceptable Relative Percentage Difference (RPD)	>10 x limit of reporting (LOR): 30% inorganics; 50% organics (field) <10 x LOR: assessed on individual basis (field) >5 x LOR: 50% (laboratory) <5 x LOR: no Limit (laboratory)
Adequate Laboratory Performance	Based on acceptance criteria of laboratory as specified on certificate of analysis, and includes: blank samples, matrix spikes, control samples, and surrogate spike samples. Use of analytical laboratories with adequately trained and experienced testing staff experienced in the analyses undertaken, with appropriate NATA certification.
DATA REPRESENTATIVENESS	
Sample and Analysis Selection	Representativeness of all contaminants of concern.
Field Duplicates	>10 x LOR: 30% inorganics; 50% organics
Laboratory Selection	Adequate laboratory internal quality control and quality assurance methods, complying with the NEPM (NEPC, 2013).
DOCUMENTATION COMPLETENESS	
Chain of Custody Records	Laboratory sample receipt information received confirming receipt of samples intact and appropriate chain of custody.
	NATA registered laboratory results certificates provided.
DATA COMPLETENESS	
	Analysis for all contaminants of concern.
	Field duplicate sample numbers complying with NEPM (NEPC, 2013)
COMPARABILITY	
	Use of NATA registered laboratories.
	Detailed logs of all sample locations recorded.
	Acceptable RPD's between original samples and field duplicates.

6.2 Sampling Plan and Rationale

6.3 General

The aim of the intrusive field investigations was target areas of environmental concern identified by the PSI (ESI, 2015) whilst providing a broad assessment of the contamination status of the Site.

For a site covering a total area of approximately 1.4 hectares, the NSW EPA (1995) *Contaminated Sites: Sampling Design Guidelines* recommends the collection of samples from a minimum of 25 test location. Although the overall sampling density achieved as part of the combined Due Diligence Assessment (DLA, 2016) and current DSI is marginally less than the recommendation, it is considered sufficient given that some areas of the Site remain inaccessible due to the presence of buildings and continuing commercial activities.

The sampling plan was developed based on DLA's knowledge of the Site history and operational requirements at the Site, which provided for samples to be collected in an unbiased manner. Fieldwork, including sample collection, was carried out by DLA staff who are specifically trained in hazardous waste field investigation techniques and health and safety procedures. All techniques used are specified in DLA Field Manual for Contaminated Sites, which are based on methods specified by the NEPM (NEPC, 2013).

6.3.1 Soil

Prior to drilling, the subsurface of the Site at each borehole location was screened for the presence of underground services by a qualified and experienced cable locator in consultation with Dial-Before-You-Dig (DBYD) service plans. Where required, the concrete pavement at each cleared location was cored using a 115mm diameter diatube to allow access to the underlying subsurface.

Soil investigations comprised the drilling of 11 boreholes (BH7 to BH16 and MW4) using a mechanical drill rig to depths between 0.7m and 8.0m bgl as detailed in **Table 6c**.

Table 6c – Soil Sampling Pattern

BOREHOLE ID	LOCATION / PURPOSE
BH7	Target mechanical workshop at 122a Durham St
BH8	Target mechanical workshop at 120 Durham St, and dry cleaners at 118a Durham St
BH9	Target mechanical workshop at 120 Durham St
BH10	Provide overall coverage of accessible areas of the Site
BH11	Target unsealed area within 116 Durham St
BH12	Provide overall coverage of accessible areas of the Site
BH13	Target mechanical workshops at 9 Roberts Lane
BH14	Provide overall coverage of accessible areas of the Site
BH15	Provide overall coverage of accessible areas of the Site
BH16	Provide overall coverage of accessible areas of the Site
MW4	Provide overall coverage of groundwater beneath the Site

Soil samples were collected from each borehole for chemical analysis in general accordance with the NEPM (NEPC, 2013) and AS4482.1-2005. Samples were collected at regular depth intervals, whilst also targeting potentially contaminated soils observed during drilling. Samples were selected for laboratory analysis on the basis of the likely presence of contamination which was based on material type, visual or olfactory evidence of potential contamination (e.g. staining, filling or presence of building rubble and other anthropogenic wastes and fibre-cement sheeting), proximity to an identified area or source of contamination, and representativeness of varying soil conditions.

Samples were immediately transferred to laboratory prepared and supplied sample containers of appropriate composition (glass jars for chemical analysis). Job number; sample identification number; sampler's initials and date of sampling were recorded on sample labels affixed to the sample containers.

A photoionisation detector (PID) is often used to screen soil samples in the field for the presence of volatile organic compounds (VOCs), and to assist in the selection of samples for laboratory analysis. A PID was not used during this investigation as soil samples selected for analysis were typically based on the presence of fill material, and visible and olfactory evidence of contamination.

Soil samples were placed immediately into a chilled esky to minimise the potential for the loss of potential volatile components. The samples were transported under standard DLA chain-of-custody protocols to a NATA accredited laboratory – Envirolab Services Pty Ltd. Samples were stored and transported at temperatures below 4°C.

Refer to **Figure 2** – Site Layout and Sampling Locations.

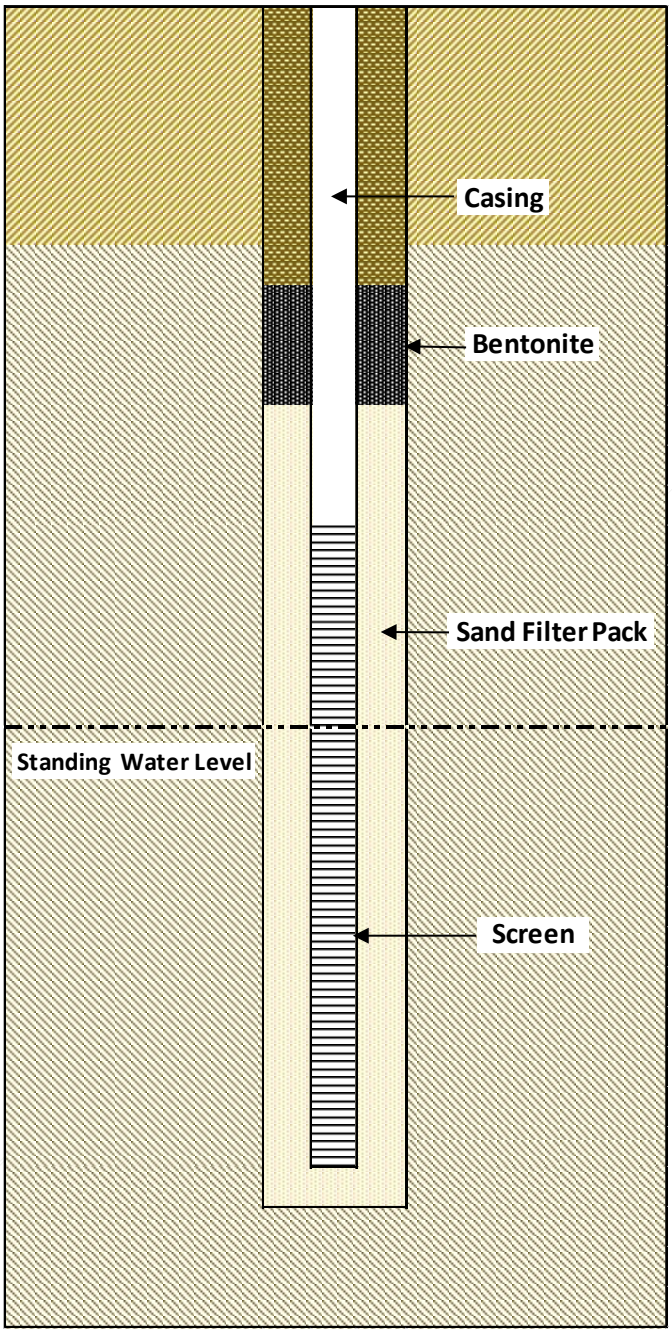
6.3.2 Groundwater

One groundwater monitoring well (MW4) was installed on the Site with the aim of supplementing the existing groundwater monitoring wells located on-site.

At the predetermined location, borehole (MW4) was extended to a depth of 8m bgl which was considered sufficient to encounter groundwater. The monitoring well was constructed of lengths of 50mm diameter screw threaded PVC casing from the surface to depths of 5m bgl, and extended to the base of the well at 8m bgl with slotted 50mm diameter PVC screen. The well screen was positioned so that approximately 2m of screen was installed below the groundwater table, and one meter was above the groundwater table. The well annulus was backfilled with graded filter (sand) pack from the base of the well to approximately 0.5m above the screen, and sealed with a 0.5m thick bentonite plug. The remainder of the well annulus was backfilled to the surface will soil cuttings and a gatic cover was installed.

A schematic of a typical groundwater monitoring well installation is provided below:

Groundwater Well Installation



Groundwater samples were collected from existing monitoring wells (MW1, MW2 and MW3), and the newly installed monitoring well (MW4) in general accordance with the NEPM (NEPC, 2013) and the *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007).

Wells were purged using a stainless-steel bailer and sampled using dedicated disposable plastic bailers.

Groundwater samples were collected into laboratory prepared and supplied sample containers for specific analytes (i.e. plastic unpreserved, plastic preserved, glass amber unpreserved, and preserved glass vials). All samples were collected and filled into the respective sample containers with no head space remaining and no loss of preservation agents occurring, where present. Groundwater samples collected for analysis for heavy metals were field filtered prior to placement into acid preserved plastic containers. Job number; sample identification number; sampler's initials and date of sampling were recorded on sample labels affixed to the sample containers.

Groundwater samples were placed immediately into a chilled esky to minimise the potential for the loss of potential volatile components. The samples were transported under standard DLA chain-of-custody protocols to a NATA accredited laboratory – Envirolab Services Pty Ltd. Samples were stored and transported at temperatures below 4°C.

Refer to **Figure 2** – Site Layout and Sampling Locations.

6.4 Analytical Strategy

Soil and groundwater samples were submitted for laboratory analysis for a suite of PCOC as summarised in **Table 6d**.

Table 6d –Analytical Plan

PCOC	No. SOIL SAMPLES	No. GROUNDWATER SAMPLES
Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	21	1
TRH	21	1
BTEX	21	1
PAH	21	1
OC / OP	13	1
PCB	13	1
VOC	7	1
Asbestos	13	0

Note: totals do not include QA/QC samples.

Additional soil samples were collected from the Site for quality assurance/ quality control (QA/QC) purposes. These included soil samples BH7_0.5 / BH7A_0.5 and MW4_2.0 / MW4A_2.0, and groundwater samples MW4 / MW4-A[1].

6.5 Investigation Criteria

6.5.1 Soil Criteria

The adopted Site Acceptance Criteria for soil was obtained from the following publications:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1)* (NEPC, 2013); and,
- *Health screening levels for petroleum hydrocarbons in soil and groundwater, Part 2: Application document, CRC CARE Technical Report no. 10*. (Friebel, E and Nadebaum, P, 2011).

It is understood that the site is to be rezoned for future 'Mixed Use' and will be redeveloped for high density residential land use with a childcare centre which is consistent with the definition of 'Residential with gardens and accessible soil' provided in Schedule B7 of the NEPM (NEPC, 2013). This land use criteria allows for childcare centres, preschools and primary schools.

With regard to the vapour intrusion criteria, Health Screening Levels (HSLs) and Management Limits (MLs) for TRH fractions in soil are based on concerns regarding inhalation of vapours and direct contact with contaminant sources.

The material type of 'clay' (or 'fine') has been used as it offers to most similar correlation to the natural soils at the Site.

[1] Note: the NATA certified analytical results and chain of custody presented in Appendix D reference the groundwater samples as MW1 and MW1-A. These should be read as MW4 and MW4-A.

Table 6e – Soil Criteria for Vapour Intrusion (mg/kg)

ANALYTES	HSL-A (Clay) 0 to 1.0m	HSL-A (Clay) 1.0 to <2.0m	HSL-A (Clay) 2.0 to <4.0m	HSL-A Direct Contact
Benzene	0.7	1	2	100
Toluene	480	NL	NL	14,000
Ethylbenzene	NL	NL	NL	4,500
Xylenes	110	310	NL	12,000
Naphthalene	5	NL	NL	1,400
$C_6 – C_{10}$ (F1)	50	90	150	4,400
$C_{10} – C_{16}$ (F2)	280	NL	NL	3,300
C_{16}-C_{34} (F3)	NA	NA	NA	4,500
C_{34}-C_{40} (F4)	NA	NA	NA	6,300

NL = Not Limiting (i.e. the soil vapour concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario).

NA = Not Applicable (i.e. NEPM (NEPC, 2013) does not provide HSLs for the F3 and F4 hydrocarbon fractions).

Vapour Intrusion Criteria sourced from NEPM (NEPC, 2013) *Table 1A(3).*

Direct Contact Criteria sourced from Friebel and Nadebaum 2011, Health Screening Levels for petroleum Hydrocarbons in Soil and Groundwater, Part 1: Technical Development Document, *Table A4.*

Table 6f – Soil Management Limits (mg/kg)

ANALYTES	ML (Fine) Urban Residential and Public Open Space
$C_6 – C_{10}$ (F1)	800
$C_{10} – C_{16}$ (F2)	1,000
C_{16}-C_{34} (F3)	3,500
C_{34}-C_{40} (F4)	10,000

Management Limits sourced from NEPM (NEPC, 2013) *Table 1B(7).*

Health Investigation Levels (HILs) presented in the NEPM (NEPC, 2013) for heavy metals, PAHs, PCBs, pesticides and asbestos are summarised in **Table 6g**.

Table 6g – HILs for Soils (mg/kg)

ANALYTES	HIL-A
Heavy Metals	
Arsenic	100
Cadmium	20
Chromium	100
Copper	6,000
Lead	300
Mercury	40
Nickel	400
Zinc	7,400
PAH	
BaP TEQ	3
Total PAHs	300
PCB	
Total PCB	1
Pesticides	
DDT+DDE+DDD	240
Aldrin and Dieldrin	6
Chlordane	50
Heptachlor	6
Endosulfan	270
Endrin	10
HCB	10
Methoxychlor	300
VOC	
VOC	< LOR

Health Investigation Levels soured from NEPM (NEPC, 2013) Table 1A(1).
BaP (TEQ): Benzo(a)pyrene Toxic Equivalence Quotient. Toxic Equivalence Quotient (TEQ) expresses an aggregate measure of toxicity based on a number of contributing PAH compounds.

The proposed redevelopment comprises the construction of high rise buildings with basement car parks. Landscaping will be limited to areas within the Site that were previously excavated to create the basement car parks and subsequently reinstated with 'clean' imported material. As such, comparison of analytical concentrations against the ecological investigation and screening levels presented in the NEPM (NEPC, 2013) is not considered necessary as future vegetation will not be exposed to existing Site soils.

6.5.2 Groundwater Criteria

The adopted Site Acceptance Criteria for groundwater was obtained from the following publications:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1)* (NEPC, 2013); and
- *Australia and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

Volatile contaminant concentrations were assessed against the groundwater HSLs for vapour intrusion from the relevant depth and soil matrix. The material type of 'clay' has been used as it offers to most similar correlation to the condition of soils at the Site.

ANZECC (2000) provides a range of Trigger Values which should be applied to different ecosystem conditions. Selection of the Groundwater Investigation Levels (GILs) has been based on the assumption that the receiving waters relative to the Site comprise 'slightly to moderately disturbed' marine water ecosystems (i.e. Oatley Bay / Georges River and Botany Bay). The Trigger Values for freshwater have also been provided for comparison purposes based on the electrical conductivity of the groundwater beneath the Site, which was measured to be between 320µS/cm and 480µS/cm. This range is indicative of freshwater environments.

Concentrations in excess of the Trigger Values are not 'clean-up' thresholds and do not automatically indicate that management or remedial action is necessary; but instead show that further investigation and evaluation of potential risks may be required.

Table 6h – Groundwater Investigation and Screening Levels (µg/L)

ANALYTES	HSL A >2m to 4m	HSL A >4 to 8m	ANZECC 95% Marine Water	ANZECC 95% Fresh Water
BTEX				
Benzene	5	5	500 [LR]	500 [LR]
Toluene	NL	NL	180 [LR]	180 [LR]
Ethylbenzene	NL	NL	5 [LR]	5 [LR]
m+p-Xylene	-	-	75 [LR] / 200 [LR]	75 [LR] / 200 [LR]
o-Xylene	-	-	350 [LR]	350 [LR]
Naphthalene	NL	NL	--	--
TRH				
$C_6 – C_{10}$ (F1)	NL	NL	10 [a]	10 [a]
$C_{10} – C_{16}$ (F2)	NL	NL	50 [a]	50 [a]
C_{16}-C_{34} (F3)	-	-	100 [a]	100 [a]
C_{34}-C_{40} (F4)	-	-	100 [a]	100 [a]
Heavy Metals				
Arsenic (V)	-	-	13 [b]	1.3
Cadmium	-	-	0.7	0.2
Chromium (III)	-	-	27	27 [c]
Copper	-	-	1.3	1.4
Lead	-	-	4.4	3.4
Mercury	-	-	0.1	0.06
Nickel	-	-	7	11
Zinc	-	-	15	8
PAH				
Benzo(a)pyrene	-	-	0.1 [LR]	0.1 [LR]
Anthracene	-	-	0.01 [LR]	0.01 [LR]
Phenanthrene	-	-	0.6 [LR]	0.6 [LR]
Fluoranthene	-	-	1 [LR]	1 [LR]
Naphthalene	-	-	50 [LR]	50 [LR]
VOC				
VOCs	-	-	<LOR [a]	<LOR [a]

NEPM (NEPC, 2013) Table 1A(4) – Groundwater HSLs for Vapour Intrusion for clay in a Low-High Density Residential land use scenario.
Australia and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000).
a - In the absence of a nominated guideline value, the laboratory LOR has been taken as the nominated trigger value for the presence of TRH and VOC compounds in groundwater.
b - Marine GILs are not available therefore Freshwater GILs have been provided.
c – Freshwater GILs are not available therefore Marine Water GILs have been provided.
LR - Low reliability trigger values for 95% protection level recommended for slightly to moderately disturbed system by ANZECC/ARMCANZ (2000), to be used as an indicative interim working level only.
NL - If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or NL.

7.0 RESULTS

7.1 Fieldwork Observations

The subsurface conditions are presented in detail in the borehole logs presented in **Appendix B**. The following soil profiles were generally observed at the Site:

PAVEMENT:	-	Concrete slab to depths of 0.2m bgl (BH7, BH8, BH9, BH10, BH12 and BH13)
	-	Concrete slab to a depth of 0.3m bgl (MW4)
FILL:	-	Clayey sand with foreign materials (brick and metal fragments) to depths between 0.5m and 1.1m and (BH7, BH10, BH12 and MW4)
	-	Sandy gravel to depths between 1.4m and 1.7m (BH8, BH9 and BH13)
	-	Sand / sandy loam to depths between 0.3m to 0.5m (BH11, BH14, BH15 and BH16)
	-	Clay to a depth of 1.4m bgl (BH9)
RESIDUAL:	-	Silty CLAY, orange with red/grey mottling (all locations)
	-	CLAY, red with ironstone banding, from 1.2m bgl (MW4)
BEDROCK	-	Weathered shale from 4.0m bgl (MW4)

Strong hydrocarbon odours and staining were encountered in the fill material in boreholes BH8 and BH9 from the surface to depths between 1.4m and 1.7m bgl. Slight hydrocarbon odours were persistent in the underlying natural soils, however no staining was visible.

Groundwater monitoring wells were gauged using an interface probe to assess the depth to groundwater and the presence of light non-aqueous phase liquid (LNAPL), if any. The gauging results are summarised in **Table 7a**.

Table 7a – Summary of Gauging Data

MONITORING WELL	DEPTH TO WATER (m bgl)	PSH DETECTED?
MW1	2.01	No
MW2	1.80	No
MW3	6.82	No
MW4	3.116	No

Gauging data for MW1, MW2 and MW3 is based on the results of previous fieldwork undertaken on-site (DLA, 2016)

7.2 Soil Analytical Results

The results of the soil sampling are summarised below.

Refer to **Table 1** in **Appendix C** – Data Summary Table, and **Appendix D** – NATA Certified Analytical Results.

7.2.1 Total Recoverable Hydrocarbons and Monocyclic Aromatic Hydrocarbons

Soil samples submitted for analysis of TRH and BTEX reported concentrations below the adopted SAC with the exception of the following:

- Sample BH8_2.0 which reported TRH F1 at a concentration of 500mg/kg which exceeds the HSL (150mg/kg);
- Sample BH9_0.8 which reported TRH F1 at a concentration of 2,300mg/kg which exceeds the HSL (50mg/kg) and the Management Limit (800mg/kg);
- Sample BH9_0.8 which reported TRH F2 at a concentration of 530mg/kg which exceeds the HSL (280mg/kg);
- Sample BH9_0.8 which reported naphthalene at a concentration of 6mg/kg which marginally exceeds the HSL (5mg/kg); and
- Sample BH9_1.5 which reported TRH F1 at a concentration of 1,500mg/kg which exceeds the HSL (90mg/kg) and the Management Limit (800mg/kg).

7.2.2 Polycyclic Aromatic Hydrocarbons

Soil samples submitted for analysis of PAHs reported concentrations below the adopted SAC with the exception of the following:

- Duplicate sample BH7A_0.5 which reported benzo(a)pyrene at a concentration of 6.7mg/kg which exceeds the HIL (3mg/kg).

7.2.3 Pesticides and Polychlorinated Biphenyls

Soil samples submitted for analysis of OCP, OPPs and PCBs reported concentrations below the adopted SAC and the laboratory LOR.

7.2.4 Volatile Organic Compounds

Soil samples submitted for analysis of VOCs reported concentrations below the adopted SAC with the exception of the following:

- Sample BH9_0.8 which reported detectable concentrations of 1,1,2,2-tetrachloroethane (2mg/kg), isopropylbenzene (15mg/kg), n-propylbenzene (37mg/kg), sec-butylbenzene (15mg/kg) and n-butylbenzene (9mg/kg); and
- Sample BH9_1.5 which reported detectable concentrations of isopropylbenzene (10mg/kg), n-propylbenzene (27mg/kg), 1,3,5-trimethylbenzene (13mg/kg), 1,2,4-trimethylbenzene (36mg/kg), sec-butylbenzene (9mg/kg), 4-isopropyltoluene (4mg/kg) and n-butylbenzene (9mg/kg).

7.2.5 Heavy Metals

Soil samples submitted for analysis of heavy metals reported concentrations below the adopted SAC with the exception of the following:

- Sample BH9_0.4 which reported cadmium at a concentration of 24mg/kg which exceeds the HIL (20mg/kg);
- Sample BH11_0.4 which reported lead at a concentration of 320mg/kg which exceeds the HIL (300mg/kg); and
- Sample BH13-0.5 which reported lead at a concentration of 770mg/kg which exceeds the HIL (300mg/kg).

7.2.6 Asbestos

Asbestos was not detected in any of the soil samples submitted for laboratory analysis.

7.3 Groundwater Analytical Results

The results of the groundwater sampling are summarised below.

Refer to **Table 2** in **Appendix C** – Data Summary Table, and **Appendix D** – NATA Certified Analytical Results.

7.3.1 Total Recoverable Hydrocarbons and Monocyclic Aromatic Hydrocarbons

Groundwater samples submitted for analysis of TRH and BTEX reported concentrations below the adopted SAC with the exception of the following:

- Sample MW4 and its duplicate MW4-A reported TRH C_6-C_{10} (F1) at concentrations exceeding the laboratory LOR.

Although detectable concentrations of toluene, ethylbenzene and xylene were reported, these remained less than the 95% Trigger Values for both fresh and marine water.

7.3.2 Polycyclic Aromatic Hydrocarbons

Groundwater samples submitted for analysis of PAHs reported concentrations below the laboratory LOR. However, given that the adopted lower reliability trigger values are less than the laboratory LOR, it is not possible to confirm whether PAH concentrations are below the adopted SAC.

7.3.3 Pesticides and Polychlorinated Biphenyls

Groundwater samples submitted for analysis of OCP, OPPs and PCBs reported concentrations below the laboratory LOR.

7.3.4 Volatile Organic Compounds

Groundwater samples submitted for analysis of VOCs reported concentrations below the laboratory LOR with the exception of the following:

- Sample MW4 reported detectable concentrations of 1,3,5-trimethyl benzene (2µg/L) and 1,2,4-trimethylbenzene (11µg/L); and
- Duplicate sample MW4-A reported detectable concentrations of n-propyl benzene (1µg/L), 1,3,5-trimethyl benzene (3µg/L) and 1,2,4-trimethylbenzene (11µg/L).

7.3.5 Heavy Metals

Groundwater samples submitted for analysis of heavy metals reported concentrations below the adopted SAC with the exception of the following:

- Sample MW4 reported copper (3µg/L) and zinc (43µg/L) at concentrations exceeding the 95% Trigger Values for fresh and marine water; and

- Duplicate sample MW4-A reported copper (3µg/L) and zinc (46µg/L) at concentrations exceeding the 95% Trigger Values for fresh and marine water.

7.4 QA/QC Comments

7.4.1 Laboratory QA/QC

Laboratory QA/QC on all samples analysed included calculation of %RPD, matrix spike recoveries, surrogate recoveries and blank determinations.

RPD calculations for laboratory duplicate soil samples reported results within the acceptable range with the exception of the following:

- Cadmium with a RPD of 99%
- Mercury with a RPD of 40%
- Nickel with a RPD of 33%
- Zinc with a RPD of 32%
- PAH-based compounds with RPDs between 31% and 67%

These outliers are expected to be due to the heterogeneous nature of the fill material comprising the samples, rather than poor laboratory techniques.

The laboratory reported that that matrix spike and surrogate recoveries were within the acceptable rang, and blanks were less than the laboratory LOR.

7.4.2 Field QA/QC

An intra-laboratory duplicate rate of approximately 10% was achieved for soil samples, which is equivalent to that required by the Field Quality Plan. No inter-laboratory duplicate soil samples were collected.

An intra-laboratory duplicate rate of 100% was achieved for groundwater samples. No inter-laboratory duplicate groundwater samples were collected.

RPD calculations for field duplicate soil samples reported results within the acceptable range with the exception of the following:

- Benzo(a)pyrene for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 139%
- Total PAH for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 144%
- Arsenic for duplicate pair MW4_2.0 / MW4A_2.0 with a RPD of 32%

- Cadmium for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 116%
- Chromium for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 76%
- Nickel for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 40%
- Zinc for duplicate pair BH7_0.5 / BH7A_0.5 with a RPD of 65%

These outliers are expected to be due to the heterogeneous nature of the fill material comprising the sample, rather than poor field techniques.

RPD calculations for field duplicate groundwater samples reported results within the acceptable range with the exception of toluene with a RPD of 67%. The primary and duplicate concentrations were reported to be close to the laboratory LOR which exaggerates the results of the RPD calculation.

Overall, the field and laboratory data obtained is considered acceptable for the purposes of this assessment.

Refer to Tables 3 and 4 in **Appendix C** - Data Summary Tables, and **Appendix E** – Quality Assurance and Quality Control.

8.0 SITE CHARACTERISATION

8.1 Discussion

A desktop review of available historical documentation, undertaken as part of previous investigations (DLA, 2016), indicates that the Site was previously occupied by a variety of land uses including a service station, bus depot, mechanical workshops, car wash and residential premises. Three USTs are known to be currently located on-site, in addition to associated fill points and vent pipes.

Subsurface conditions underlying the Site typically comprise fill material to depths of up to 1.7m bgl, underlain by residual clay and shale bedrock. Strong hydrocarbon odours and staining were identified in the fill material comprising the upper subsurface within boreholes BH8 and BH9. These boreholes were installed adjacent to a mechanical workshop at 120 Durham Street. Apart from fragments of brick and metal in the fill in boreholes BH7, BH10, BH12 and MW4, no further visible or olfactory evidence of contamination was noted during intrusive fieldwork, including anthropogenic material.

Soil samples collected from the Site and submitted for laboratory analysis reported concentrations of the chemicals of potential concern less than the adopted SAC with the exception of volatile petroleum hydrocarbons (TRH C_6-C_{16}), naphthalene and organic compounds within the fill in boreholes BH8 and BH9. The organic compounds which reported detectable concentrations comprise solvents and / or are known to be constituents of crude oil, coal tar and refined fuel. Based on the proximity of boreholes BH8 and BH9 to the workshop, it is likely that the identified contamination is directly linked to either the presence of a currently unidentified UST, or poor management of liquid waste. Although the vertical extent of the contamination was not delineated as part of these investigations, the results of the laboratory analysis indicate that it extends into the residual clay soils underlying the fill.

Cadmium and lead were also reported to exceed the adopted SAC in the fill material in boreholes BH9, BH11 and BH13. At each location, the heavy metal contamination was delineated to extend no greater than 0.8m bgl.

Statistical analysis of the identified contaminant indicates that both the petroleum hydrocarbons and heavy metals are not considered suitable to remain on-site under a high-density residential land use scenario.

Groundwater beneath the Site has been recorded at depths between 1.8m and 6.82m bgl. No LNAPL, sheens or hydrocarbon odours have been identified within the groundwater underlying the Site.

The results of the laboratory analysis indicate that groundwater in the vicinity of monitoring wells MW4 has elevated concentrations of volatile petroleum hydrocarbons and organic compounds. These

concentrations may be indicative of leakage from an UST, or may be representative of regional groundwater conditions. Based on the inferred direction of groundwater flow, and the fact that concentrations reported in monitoring well MW4 are significant less than those previously reported in groundwater monitoring wells MW1 and MW2 (DLA, 2016), it is considered that the elevated contaminant concentrations in groundwater are likely to be a result of activities occurring in hydraulically up-gradient area of the Site (i.e. the western portion of the Site).

Copper and zinc were also reported to exceed the adopted Trigger Values for both fresh and marine. It is considered likely that these concentrations are representative of background groundwater conditions associated with highly disturbed urban environments. As such, these are not considered to present a risk to human health or the environment.

8.2 Preliminary Waste Classification

The development plans indicate that most of the subsurface of the Site will be excavated to depths of approximately 6m below the existing ground level to facilitate construction of a two-level basement car park.

A preliminary waste classification has been carried out using existing analytical data to provide an indicative classification to facilitate off-site disposal of excavated soil and rock. Analytical results were compared against the contaminant thresholds presented in Table 1 of the NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste*. The data indicates the following:

- Soil in the vicinity of samples BH9_0.4, BH11_0.4 and BH14_0.3 has a preliminary classification as Restricted Solid Waste due to elevated concentrations of cadmium and lead. Further analysis of these samples to assess the leachability potential of metals using toxicity characteristics leaching procedure (TCLP) may allow re-classification of the material as General Solid Waste.
- Soil in the vicinity of samples BH7_0.5 and BH13_0.5 has a preliminary classification as Hazardous Waste due to elevated concentrations of lead and benzo(a)pyrene. Further analysis of these samples to assess the leachability potential of metals using TCLP may allow re-classification of the material as General or Restricted Solid Waste.
- The remainder of the samples are classified as General Solid Waste, non-putrescible.

A more detailed assessment of the fill material comprising the upper 1.7m of the Site would be required to more thoroughly classify this material to facilitate appropriate off-site disposal.

9.0 CONCLUSIONS AND RECOMMENDIATIONS

The sampling regime and subsequent assessment and reporting of the Site are considered to be adequate to evaluate the suitability of the Site for its intended use in accordance with the general requirements of State Environmental Planning Policy No.55 (SEPP 55). All reporting has been undertaken in accordance with the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2011) and the *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd ed., 2006).

Based on the findings of this investigation, DLA concludes that the Site is not currently considered suitable for future residential land use from a contamination perspective due to elevated TRH, VOC and heavy metal concentrations within soil, and the presence of petroleum-based contamination in groundwater. Given that most of the subsurface of the Site will be excavated to depths of approximately 6m bgl to create a basement car park, the identified areas of soil contamination will be removed as part of the redevelopment of the Site. In addition, removal of any previously unidentified USTs and associated pipework will be necessary.

Recommendations

On the basis of the conclusions in this report, it is recommended that a Remediation Action Plan (RAP) be developed in accordance with the relevant regulatory requirements to address the identified contamination issues and render the Site suitable for the proposed land use.

The RAP would include, but not be limited to:

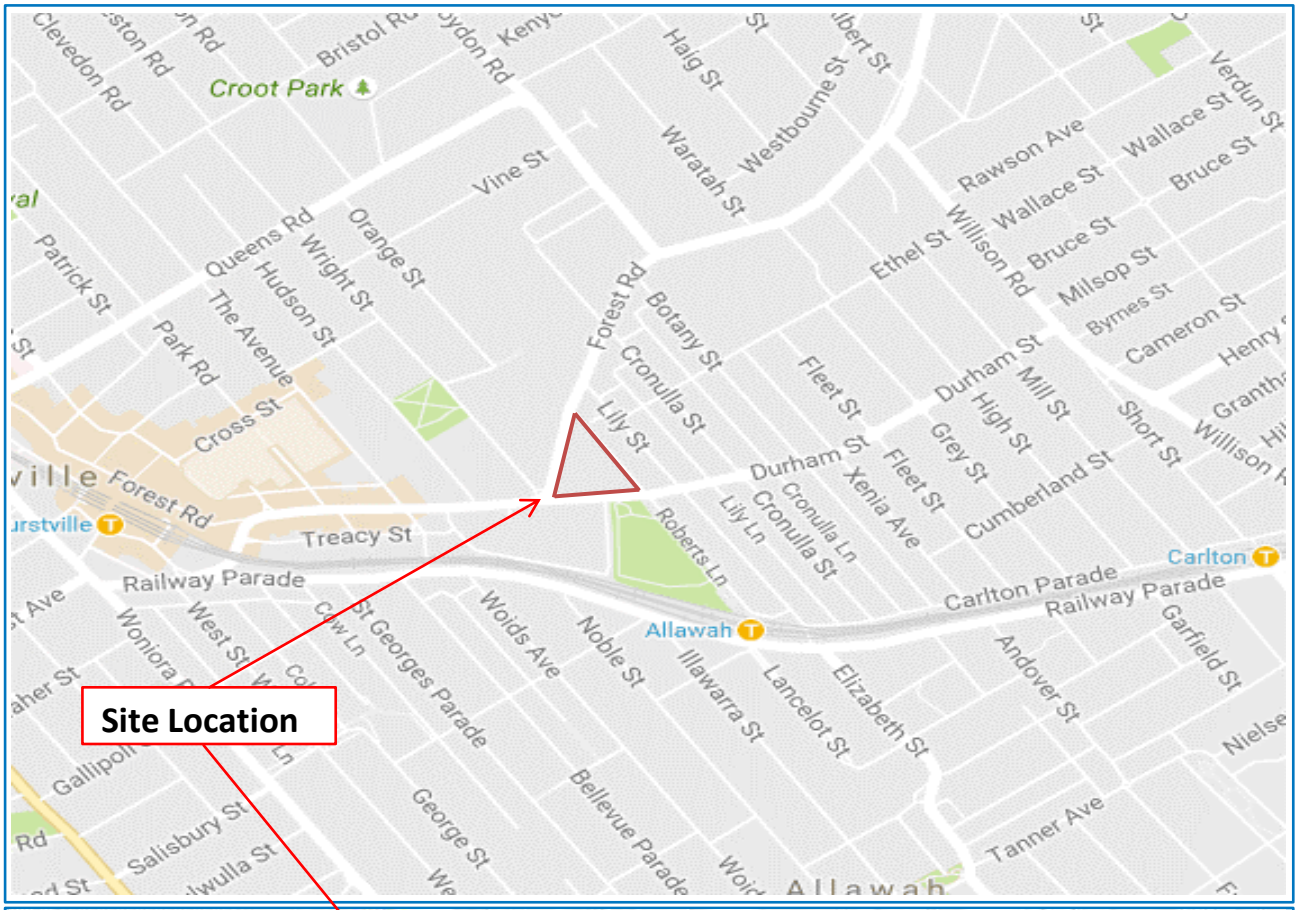
- Defined remediation goals;
- A framework for delineation of the contaminated soils identified on-site, and / or a process for classification of fill material across the Site and to facilitate appropriate off-site disposal;
- A framework for delineation of the contaminated groundwater identified beneath the Site;
- Procedures and plans to be implemented to manage contamination issues and remediate the Site, including requirements for removal of the USTs and associated pipework, preferential excavation of contaminated soils, and treatment of contaminated groundwater;
- Human health and environmental management procedures to be implemented;
- Compliance requirements (necessary approvals and licences required); and,
- A validation program of to demonstrate suitability of the Site for the proposed future land use.

The DSI concludes that the Site can be made suitable for the intended land use consistent with NEPM (NEPC, 2013) *Residential A – Residential with Gardens / Accessible soil*, following implementation of the aforementioned recommendations.

10.0 REFERENCES

- ANZECC (2000). *Australian and New Zealand Guidelines for Assessment and Management of Contaminated Sites.* Australian and New Zealand Environment and Conservation Council.
- *AS 4482.1-2005 Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds.*
- DLA (2016). *Due Diligence Assessment, Landmark Square, Forest Road, Durham Street and Roberts Lane, Hurstville NSW 2220*. DLA Environmental Services.
- EI (2015). *Preliminary Site Investigation, Landmark Square, Forest Road, Durham Street & Roberts Lane, Hurstville NSW*. Environmental Investigations Australia Pty Ltd.
- Friebel, E and Nadebaum, P (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater, Part 2: Application document, CRC CARE Technical Report no. 10*. CRC for Contamination Assessment and Remediation of the Environment.
- NEPC (1999). *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1).* National Environment Protection Council.
- NSW DEC (2006). *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. New South Wales Department of Environment and Conservation.
- NSW DEC (2007). *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination.* New South Wales Department of Environment and Conservation.
- NSW EPA (2011). *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* New South Wales Environment Protection Authority.
- NSW EPA (2014). *Waste Classification Guidelines*. New South Wales Environment Protection Authority.

FIGURE 1 – SITE LOCATION



DLA Environmental Services A Pacific Environment company Unit 3, 38 Leighton Place Hornsby NSW 2077	**DESIGNED:** DLA **COMPILED:** SK+MJ **PROJ. No.** DL3959	**FIGURE TITLE:**	SITE LOCATION	**DATE:** 20/02/2017
		PROJECT TITLE:	Landmark Square, Hurstville NSW	**DRAWING:** Version 1.0
		CLIENT:	Foresight Management	**FIGURE:** 1

FIGURE 2 – SITE LAYOUT AND SAMPLE LOCATIONS

DLA Environmental Services
A Pacific Environment company

Compiled
SK+MJ

Legend

- Site Boundary
- DLA Borehole Locations
- DLA Monitoring Well Locations
- Approx. UST Locations

N

Approximate Scale

0m 20m 40m

Figure Title
Site Layout & Sample Locations

Project Title
Landmark Square, Hurstville NSW

Client
Foresight Management

Project No.	Date	Scale	Figure No.	Revision
DL 3959	20/2/17	As Shown	2	Version 1.0

APPENDIX A – DANGEROUS GOODS RECORDS

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D17/079080
Your Ref: Richard Bolton

Attention: Richard Bolton
DLA Environmental Services
3/38 Leighton Pl
Hornsby NSW 2077

Dear Mr Bolton

RE SITE: Landmark Square Forest Rd & Durham St & Roberts lane Hurstville NSW

I refer to your site search request received by SafeWork NSW on 17 February 2017 requesting information on Storage of Hazardous Chemicals for the above site.

Enclosed are copies of the documents that SafeWork NSW holds on record numbers 35/014901 for 61-65 Forest Rd Hurstville only, all other addresses no record found, relating to the storage of Hazardous Chemicals at the above-mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

APPLICATION FOR: REGISTRATION OF PREMISES
STORE LICENCE
AMENDMENT TO REGISTRATION OR LICENCE
} FOR THE KEEPING OF INFLAMMABLE LIQUID AND/OR DANGEROUS GOODS. 4

Name of Occupier F G O'BRIEN LTD
(Surname) (First Names)

Trading Name (if any)

Postal Address Postcode

Address of the premises in which the depot or depots are situated 61 - 65 Forest Road, HURSTVILLE 2220
Postcode

Occupation glass merchants

Nature of Premises store

Particulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

PLEASE SKETCH SITE ON BACK OR ATTACH PLAN

Depot No.	Construction of depots *			Inflammable Liquid		Dangerous Goods						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m^3	Class 5A# litres	Class 5B# litres	Class 9 litres
1	Underground Tank			5000								
2												
3												
4												
5												
6												
7												
8												
9												
10												
	TOTAL											

PUBLIC REVENUE A/c
Cheque $12.00
(Date) 22.4.76
Receipt No. 6784

* If kept in tanks describe depots as underground or aboveground tanks.

Insert water capacity of tanks or cylinders.

Name of Company supplying inflammable liquid Mobil

Have premises previously been licensed?

If known, state name of previous occupier F G O'brien (St. George) Pty Ltd-

Signature of applicant Edward Brook JP Date 6.5.76

CERTIFICATE OF INSPECTION

I, Joseph Edward Brook being an Inspector under th Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with th requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammab liquid and/or dangerous goods in quantity and nature specified.

Signature of Inspector J E Brook

Application for Registration of ... alteration or amendment of any such Registration or License, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915 (as amended), for the ensuing year.

EXPLANATORY (MOBIL)

Inflammable Liquid–

Mineral Oil – includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit – includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods–

Class 1.–Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.–Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

AMEND C14901 to DIV A to 31-3-69

Class 3.–Nitro-cellulose product.

Class 4.–Compressed or dissolved acetylene contained in a porous substance.

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, Department of Mines, Sydney, and must be accompanied by the prescribed fee, as set out hereunder:–

Registration of Premises (Fee $3.00 p.a.) – For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee $6.50 p.a.) – For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7) – For quantities exceeding 4,000 gallons of mineral and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. ($15.00 p.a.).

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915 (as amended), or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

1. Name in full of occupier: FRANK G. O'BRIEN (ST GEORGE) PTY LTD
2. Occupation: Store Merchants
3. Locality of the premises in which the depot or depots are situated: No. or Name 61-65; Street FOREST RD; Town HURSTVILLE 2220
4. Nature of premises (Dwelling, Garage, Store, etc.): Store
5. Will mineral spirit be kept in a prescribed underground tank depot? Yes.

16/4

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time

Depot No.	Construction of Depots: Walls	Roof	Floor	Inflammable Liquid: Mineral Spirit Gallons	Mineral Oil Gallons	Dangerous Goods: Class 1 Gallons	Class 2 Gallons	Class 3 lb.	Class 4 cub. ft.
1	Underground Tank.			1000					
2									
3									
4						Chq	3-50		
5							6/5/68		
6								2187	
7									
8									
9									
10									

FRANK G. O'BRIEN (ST GEORGE) PTY LTD

Date of Application 20/4/1968

Signature of Applicant: Frank G. O'Brien

Postal Address: as above.

CERTIFICATE OF INSPECTION

I, A. Leonard Bissett being an Inspector under the Inflammable Liquid Act, 1915 (as amended), do hereby certify that the premises or store herein referred to and described is suitable with regard to its situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

A. L. Bissett

alteration or amendment of any such Registration or License, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915 (as amended), for the ensuing year.

EXPLANATORY

Inflammable Liquid—

Mineral Oil—includes kerosene, mineral turpentine and white spirit (for cleaning), and compositions containing same.
Mineral Spirit—includes petrol, benzene, benzolene, benzol and naphtha, and compositions containing same.

Dangerous Goods—

Class 1.—Acetone, amyl acetate, butyl acetate, carbon bisulphide; any combination of substances of an inflammable character suitable for use as an industrial solvent and having a true flashing point of less than 73 degrees Fahrenheit.

Class 2.—Nitro-cellulose (also known as "pyroxylin" and "collodion cotton") moistened with an alcohol, butyl alcohol (also known as "butanol"), methylated spirits, vegetable turpentine; and any liquid or solid containing methylated spirits, having a true flashing point of less than 150 degrees Fahrenheit.

Class 3.—Nitro-cellulose product.

Class 4.—Compressed or dissolved acetylene contained in a porous substance.

Mail Licensing Division
"

DIRECTIONS

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, No. 16 Grosvenor Street, Sydney (Box 48, G.P.O.), and must be accompanied by the prescribed fee, as set out hereunder:—

Registration of Premises (Fee £1 10s. 0d. p.a.).—For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept in separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.

In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.

Store License, Div. A (Fee, £3 5s. 0d. p.a.).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1 and 2.

Store License, Div. B (Fees, See Regulation 7).—For quantities exceeding 4,000 gallons of mineral and/or mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
For the keeping of Dangerous Goods of Classes 3 and/or 4. **(£7 10s. 0d. p.a.).**

2. The certificate of inspection at foot hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915 (as amended), or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area of Sydney, it is requested that such certificate be obtained prior to forwarding application.

1. Name in full of occupier ... Frank Ly Pty Ltd (Alf George)
2. Occupation ... Glass Merchants
3. Locality of the premises in which the depot or depots are situated ... No. or Name 61-65
   Street Forest Rd
   Town Hurstville
4. Nature of premises (Dwelling, Garage, Store, etc.) ... Shop
5. Will mineral spirit be kept in a prescribed underground tank depot? Yes

6. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

Depot No.	Construction of Depots			Inflammable Liquid		Dangerous Goods			
	Walls	Roof	Floor	Mineral Spirit Gallons	Mineral Oil Gallons	Class 1 Gallons	Class 2 Gallons	Class 3 lb.	Class 4 cub. ft.
1	Underground tank			500	(1000 restricted)				
2									
3					Cash 1 20/-				
4									
5					Public Revenue Account				
6					(Date) 24-4-63				
7					8454				
8					Receipt No.				
9									
10									

Date of Application 17th April 1963

Signature of Applicant X Kenglink (Asst Mngr)

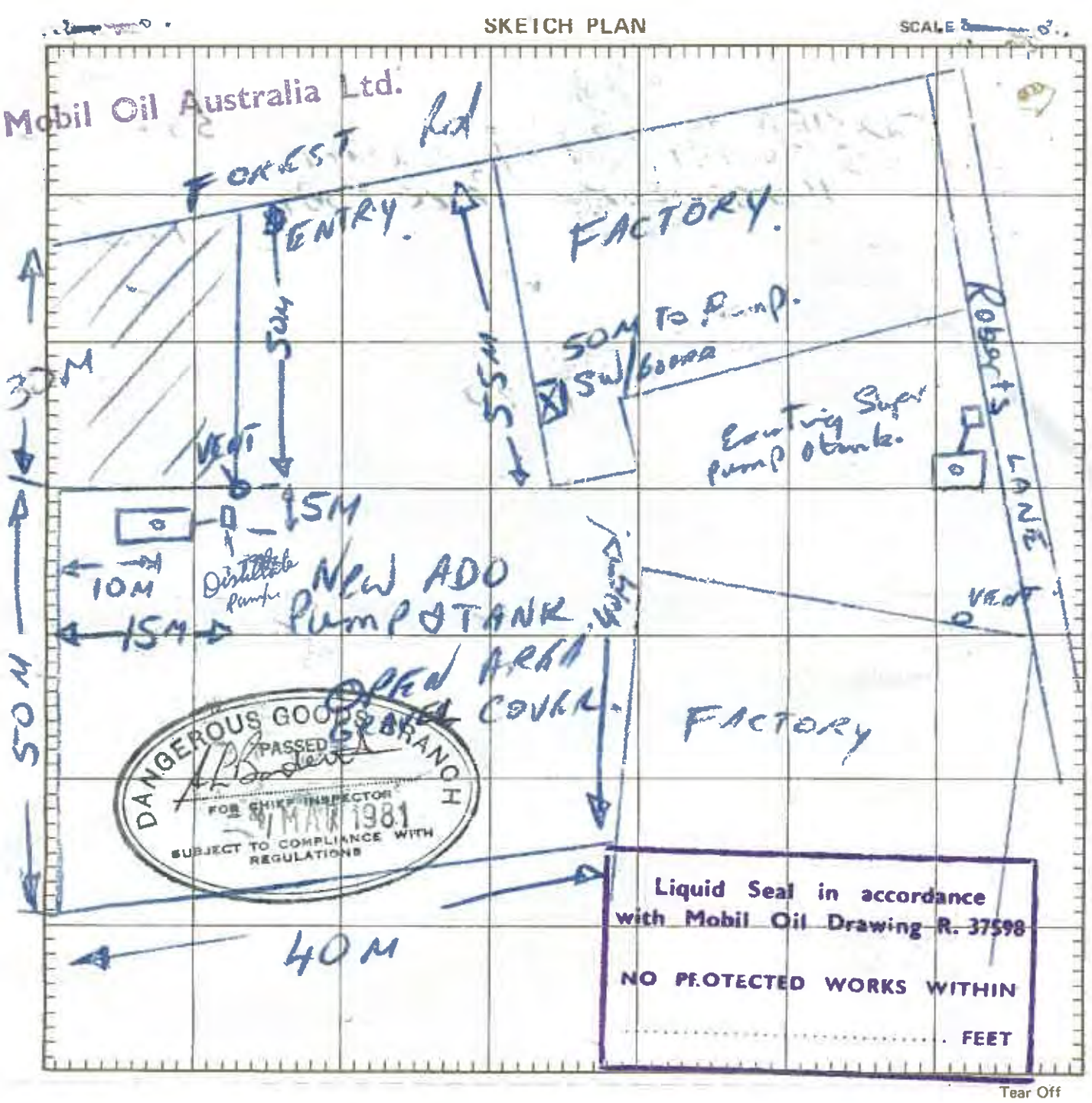
Postal Address 61 Forest Rd Hurstville

CERTIFICATE OF INSPECTION

I, [illegible] being an Inspector under the Inflammable Liquid Act, 1915 (as amended), do hereby certify that the premises or store herein referred to and described is suitable with regard to its situation and construction for the safe keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

Place Hurstville

Signature of Inspector [illegible]



Tear Off

ON PLAN

Mark clearly product on pumps and tanks.

Show position of pumps, tanks, vent pipes, Fill Points and Switchboard.

Give measurements from base of Pump(s) to centre of Tank(s); from Tank(s) to Fill Point(s); from Tank(s) to nearest wall for vent, or to a post. Show height of wall or post.

Describe type of ground i.e. clay, rock, swamp, sand, etc., and water - table level;

Type of existing and proposed surface i.e. concrete, bitumen, gravel, etc.

Access to the site for installation of equipment in week-ends and week days. Will special arrangement be needed? Explain!

GENERAL INFORMATION –

If other than a new installation show clearly Pumps, Tanks, Lines that are to be removed, relocated or replaced To comply with explosive regulations, Fill Points must be outside the building, and at least 5' from the nearest door or window. Vents must be 3' clear of doors, windows or other openings.

EXCAVATION DETAILS –

	Length	Width	Depth		Length	Width	Depth
500 gln. Tanks	8'0"	4'10"	6'6"	4000 gln. Tanks	19'0"	8'6"	9'6"
1000 " "	9'6"	6'0"	7'6"	5000 " "	24'0"	8'6"	9'6"
2000 " "	14'0"	7'3"	8'9"	6000 " "	28'0"	8'6"	9'6"
3000 " "	16'3"	8'0"	9'6"				

REQUEST FOR CONSUMER EQUIPMENT

V61 (REV) 6/73

Mobil Oil Australia Ltd.

CUSTOMER NAME: OBRIEN GLASS	CUSTOMER NO 5526165
NAME & ADDRESS OF S/S OR BUSINESS: 65 FOREST Rd. HURSTVILLE / CONTACT PETER ROBY.	RESELLER ☐ INDUSTRIAL ☑
COUNCIL PERMIT	CREDIT RATING
TERRITORY NO. 1003	

EQUIPMENT REQUIREMENTS: PLEASE ARRANGE TO – INSTALL ☑ REMOVE ☐ RELOCATE ☐ REPLACE ☐

PRODUCT	PUMPS			HOSE		TANKS							INITIAL FILL
				LENGTH	DIA.	UNDERGROUND		ON GROUND		OVER HEAD		STND	
	MANUAL	SINGLE	DUAL	FEET	IN.	NO.	SIZE	NO.	SIZE	NO.	SIZE	HIT	GALLONS
ADO		1				1	20						

OTHER EQUIPMENT:

COMPLETE FOR ELECTRIC METER PUMPS ONLY	ELECTRICITY CONNECTED ☑ YES ☐ NO	TYPE OF CURRENT ☑ AC ☐ DC	PHASE 1	VOLT 240 CYCLES 50
WILL SWITCHBOARD ALLOW FOR AN ADDITIONAL FUSE FOR EACH PUMP ☐ YES ☐ NO	MEASUREMENT—BASE OR NEAREST PUMP TO SWITCHBOARD			

DETAILS OF EXISTING MOBIL EQUIPMENT

METER PUMPS			MANUAL PUMPS			POWER PUMPS	
S	D	N.C.	S	D	PORT.	ELEC.	ENG.
1							

TANK SIZE	500	1000	[illegible]	T5			
PRODUCT			[illegible]	Super.			
UNDERGROUND				✓			
ON GROUND							
OVERHEAD							

HOISTS	COMP–RESSOR	LIGHT–ING	O/HD REELS	A&W UNITS	METERS	PRIME SIGN	

NAC 2083 Rheem 2/3/81

Tear Off

RETURN THIS SECTION TO–

JUSTIFICATION OF WORK TO BE DONE (SKETCH OF SITE PLAN SHOWN ON REVERSE SIDE)

DATE 4 / 2 / 80

CUSTOMER NAME AND ADDRESS OBRIEN GLASS - HURSTVILLE

DISTANCE FROM SUPPLY POINT 16Km

CUSTOMER NO. 5526165 TERR. NO. 1003

Negotiated fixed price for installation
Customer will pay for tank. Part
of a national deal.

PRODUCT	REBATE	VOLUME	TANKAGE	DROP SIZE	DELV. TIME		DELIVERY MODE		TICK ✓
					DAY & NIGHT	DAY-ONLY	ROUTED	BY ORDER	
ADO		100000	20000						WHERE
Super		10000	5000						APPLI–
									CABLE

SALES REP.	[signature]	OPERATIONS SNR. AREA ENGINEER	
SALES AREA MANAGER	MR	BRANCH/FIELD MANAGER	
AREA CREDIT MANAGER			

OPERATIONS TO COMPLETE

ESTIMATED COST – $

EST. START DATE / /

RFM

BRICK & IRON
WORKSHOP.

65'-0"

1¼" VENT LINE

14'-0"

FILL POINT

1½" PRODUCT LINE

3'-0"

1000 gal M.S. STORAGE TANK (BURIED)

16'-0"

32'-0"

2'-0"

PUMP

GRAVEL DRIVE & PARKING AREA.

152'-0" APPROX.

18'-0" WIDE GATE

95'-0"

CHAIN WIRE FENCE

ROBERTS LANE

ASBESTOS CEMENT & STEEL

STORE & SHOWROOM.

FOREST ROAD

EXPLOSIVES DEPT
PASSED
A. McKinnon
Pro. Supervisor
25-3-63

PROPOSED UNDERGROUND PETROL STORAGE TANK AND PUMP FOR - F. G. OBRIEN LTD
61-65 FOREST RD
HURSTVILLE

AMOCO AUST. PTY. LTD.
P.O. BOX 109
WATERLOO — SYDNEY

APPENDIX B – BOREHOLE LOGS

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH7**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
				Clayey SAND: Brown/dark grey with foreign materials such as bricks and metals, fine to coarse gravels.	W	0.5 A+B	FILL: No odours, staining or contamination indicators.	
	1.1			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.	D	1.5	NATURAL: No odours, staining or contamination indicators.	
	1.5			END OF BOREHOLE				

Soil Profile Log

Location **BH8**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
				Sandy GRAVELS: Black with inclusions of grey clays.	W	0.4	Strong hydrocarbon/petroleum based product odour with staining observed. Possible Oil tank under workshop.	
	1.7			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.		2	Slight Hydrocarbon/petroleum based product odour, no surface staining observed. Infiltration of above materials likely cause.	
	2			END OF BOREHOLE				

Soil Profile Log

Location **BH9**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
	0.7			Sandy GRAVELS: Black with inclusions of grey clays.	W	0.4	Strong hydrocarbon/petroleum based product odour with staining observed. Possible Oil tank under workshop.	
	1.4			CLAY: Grey, with sandy gravels black.		0.8		
	1.7			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.		1.5	Slight Hydrocarbon/petroleum based product odour, no surface staining observed. Infiltration of above materials likely cause.	
				END OF BOREHOLE				

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH10**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
				Clayey SAND: Brown/dark grey with foreign materials such as bricks and metals, fine to coarse gravels.	M	0.5	FILL: No odours, staining or contamination indicators.	
	0.75			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.	D	1	NATURAL: No odours, staining or contamination indicators.	
	1.1			END OF BOREHOLE				

Soil Profile Log

Location **BH11**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	-----	Method:	Hand Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.1			Paving: Bricks				
	0.3			SAND: White/yellow			FILL: No odours, staining or contamination indicators.	
	0.5			Sandy LOAM: Brown/Dark Brown Topsoil	D	0.4		
	0.8			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.		0.7	NATURAL: No odours, staining or contamination indicators.	
				END OF BOREHOLE				

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH12**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
	0.5			Clayey SAND: Brown/dark grey with foreign materials such as bricks and metals, fine to coarse gravels.	M	0.4	FILL: No odours, staining or contamination indicators.	
	0.9			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.	D	0.8	NATURAL: No odours, staining or contamination indicators.	
				END OF BOREHOLE				

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH13**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.2			Concrete	D			
				Sandy GRAVELS: Black with inclusions of grey clays.	W	0.5	FILL: No odours, staining or contamination indicators.	
	0.6			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.	D	0.7	NATURAL: No odours, staining or contamination indicators.	
	0.8			END OF BOREHOLE				

Soil Profile Log

Location **BH14**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	------	Method:	Hand Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.3			Sandy LOAM: Black	D	0.3	FILL: No odours, staining or contamination indicators.	
	0.7			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.			NATURAL: No odours, staining or contamination indicators.	
				END OF BOREHOLE				

Soil Profile Log

Location **BH15**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.3			Sandy LOAM: Black	D		FILL: No odours, staining or contamination indicators.	
	0.7			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.		0.5	NATURAL: No odours, staining or contamination indicators.	
				END OF BOREHOLE				

Soil Profile Log

Location **BH16**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	-------	Method:	Hand Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.4			Sandy LOAM: Black	D	0.4	FILL: No odours, staining or contamination indicators.	
	0.7			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.			NATURAL: No odours, staining or contamination indicators.	
				END OF BOREHOLE				

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **MW4**

Client:	Foresight Management	Job Type:	Due Diligence Assessment
Project No:	DL3959	Address:	Forest rd, Durham St Hurstville, 2220
Date:	15/02/2017	Logged By:	Matthew Junghans
Contractor:	Fico Drilling	Method:	5 tonne truck mounted Auger
Hole Size	100mm	Co-ordinates:	N/A

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0			Concrete	D			Bentonite Clay
	0.3			Clayey SAND: Brown/dark grey with foreign materials such as bricks and metals, fine to coarse gravels.	M	0.5	FILL: No odours, staining or contamination indicators.	
	0.8			Silty CLAY: Orange, with CLAY: mottled red/grey, very stiff medium plasticity.				
	1.2			CLAY: Red, very stiff, very hard with ironstone banding.	D	2+D	NATURAL: No odours, staining or contamination indicators. Increasingly gets wet at 4.5m	1-2mm Sand
	4			SHALE: Weathered dark grey, very hard.	M	7.4		Bentonite Clay
	8			END OF MW				1-2mm Sand

APPENDIX C – DATA SUMMARY TABLES

Table 1 - Soil Analytical Results
Detailed Site Investigation
Landmark Square, Hurstville

Sample ID	Depth (m)	Date	Chemical Report	Asbestos	BTEX - Clay soils				Naphthalene	TRH - Clay soils				PAH		Pesticides						Pesticides			Total PCB	VOC								Heavy Metals							
					Benzene	Toluene	EthylBenzene	Xylene		F1	F2	F3	F4	BaP TEQ	Total PAH	DDT, DDE, DDD	Aldrin + Dieldrin	Chlordane	Heptachlor	Endosulfan	Endrin	HCB	Methoxychlor	OP		1,1,2,2-tetrachloroethane	Isopropylbenzene	n-propyl benzene	1,3,5-trimethyl benzene	1,2,4-trimethyl benzene	sec-butyl benzene	4-isopropyl toluene	n-butyl benzene	As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
SITE ASSESSMENT CRITERIA																																							
HIL A Residential (NEPC, 2013)				ND	-	-	-	-	-	-	-	-	-	3	300	240	6	50	6	270	10	10	300	-	1	<1	<1	<1	<1	<1	<1	<1	<1	100	20	100	6000	300	40	400	7400
HSL A Residential, 0-<1m, clay (NEPM, 2013)				-	0.7	480	NL	110	5	50	280	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Residential, 1-<2m, clay (NEPM, 2013)				-	1	NL	NL	310	NL	90	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Residential, 2-<4m, clay (NEPM, 2013)				-	2	NL	NL	NL	NL	150	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Residential, +4m, clay (NEPM, 2013)				-	3	NL	NL	NL	NL	290	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Management Limits, Urban Residential, fine (NEPC, 2013)				-	-	-	-	-	-	800	1000	3500	10000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Direct Contact (Friebel, et al, 2011)				-	100	14000	4500	1200	1400	4400	3300	4500	6300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PRIMARY SAMPLES																																							
BH7	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	1.2	12	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	5	3	22	28	69	<0.1	6	73
BH7	1.5	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	63	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	<0.4	38	<1	12	0.2	<1	1
BH8	0.4	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	8	2	60	26	67	0.1	5	55
BH8	2.0	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	500	300	<100	<100	<0.5	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	<0.4	26	<1	8	0.2	1	1
BH9	0.4	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.20	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	7	24	65	42	97	0.2	20	130
BH9	0.8	15-Feb-17	162043	ND	<0.2	<0.5	1	<1	6	2300	530	<100	<100	<0.5	2	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2	15	37	<1	11	15	<1	9	5	0.8	45	<1	10	<0.1	2	4
BH9	1.5	15-Feb-17	162043	ND	<0.2	<0.5	6	<1	5	1500	680	<100	<100	<0.5	2.8	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	10	27	13	36	9	4	9	<4	<0.4	35	<1	10	<0.1	<1	<1
BH10	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.7	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	14	<0.4	53	19	73	0.2	4	85
BH10	1.0	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	<0.4	49	<1	14	<0.1	2	2
BH11	0.4	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	1.8	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1	<1	<1	<1	<1	86	9.6	42	370	320	0.4	6	410
BH11	0.8	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	<0.4	43	13	24	<0.1	3	18
BH12	0.4	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.9	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	5	<0.4	44	15	16	<0.1	16	20
BH12	0.8	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	<0.4	53	<1	8	<0.1	4	4
BH13	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.9	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	7	0.6	20	180	770	0.3	38	410
BH13	0.7	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	9	<0.4	60	4	23	<0.1	5	10
BH14	0.3	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	0.7	6.2	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	7	0.6	27	60	200	0.4	7	150
BH15	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	0.4	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	7	<0.4	29	20	71	0.1	4	50
BH16	0.4	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	3.7	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	<4	<0.4	37	10	29	<0.1	3	44
MW4	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	3.4	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	5	<0.4	52	8	31	<0.1	3	28
MW4	2.0	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	<0.4	56	<1	15	0.1	2	6
MW4	2.4	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<4	<0.4	19	3	8	<0.1	1	1
INTRA-LABORATORY DUPLICATES																																							
BH7A	0.5	15-Feb-17	162043	ND	<0.2	<0.5	<1	<1	<1	<25	<50	260	<100	6.7	74	<0.3	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	-	-	-	-	-	-	-	-	6	1	49	24	51	0.2	4	37
MW4A	2.0	15-Feb-17	162043	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	<0.4	61	<1	17	0.1	<1	8
STATISTICAL ANALYSIS																																							
Min					0.0	0.0	1.0	0.0	5.0	63.0	300.0	0.0	0.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	10.0	27.0	13.0	11.0	9.0	4.0	9.0	5	0.6	19	3	8	0.1	1	1
Max					0.0	0.0	6.0	0.0	6.0	2300.0	680.0	0.0	0.0	1.2	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	15.0	37.0	13.0	36.0	15.0	4.0	9.0	86	24	65	370	770	0.4	38	410
Avg					-	-	3.5	-	5.5	1090.8	503.3	-	-	-	2.7	-	-	-	-	-	-	-	-	-	-	2.0	12.5	32.0	13.0	23.5	12.0	4.0	9.0	12.0	5.8	41.7	57.0	89.3	0.2	7	75.1
Stdev					-	-	3.5	-	0.7	1005.8	191.4	-	-	0.4	3.3	-	-	-	-	-	-	-	-	-	-	-	3.5	7.1	-	17.7	4.2	-	0.0	19.9	8.6	14.0	101	173.4	0	9.0	122.4

* Depth relates to Depth Below Surface Level
nd = Not Detected Above Laboratory LOR
-- Not Tested
RED = Exceeds HIL Criteria

DL3959

Table 2 - Groundwater Analytical Results
Detailed Site Investigation
Landmark Square, Hurstville

Sample ID	Date	Chemical Report	BTEXN						TRH				PAHs					Volatile Organic Compounds								Pesticides		PCBs	Heavy Metals							
			Benzene	Toluene	EthylBenzene	m+p-Xylene	o-Xylene	Naphthalene	F1	F2	F3	F4	Benzo(a)pyrene	Anthracene	Phenanthrene	Fluoranthene	Naphthalene	1,1,2,2-tetrachloroethane	isopropylbenzene	n-propyl benzene	1,3,5-trimethyl benzene	1,2,4-trimethyl benzene	sec-butyl benzene	4-isopropyl toluene	n-butyl benzene	OCP	OPP	PCBs	As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
SITE ASSESSMENT CRITERIA																																			
HSL A, SWL >2-4m (NEPC, 2013)			5000	NL	NL	-	-	NL	NL	NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95% Trigger Values, Marine Water (ANZECC, 2000)			500	180	5	75	350	1	10	50	100	100	0.1	0.01	0.6	1	50	1	1	1	1	1	1	1	1	0.2	0.2	2	13	0.7	27	1.3	4.4	0.1	7	15
95% Trigger Values, Freshwater (ANZECC, 2000)			500	180	5	75	350						0.1	0.01	0.6	1	50												13	0.2	1	1.4	3.4	0.06	11	8
PRIMARY SAMPLES																																			
MW1 (MW4)	23-Feb-17	162418	<1	1	2	7	4	<1	43	<50	<100	<100	<1	<1	<1	<1	<1	<1	<1	<1	2	9	<1	<1	<1	<0.2	<0.2	<2	1	<0.1	<1	3	<1	<0.05	3	43
INTRA-LABORATORY SAMPLES																																			
MW1-A (MW4_A)	23-Feb-17	162418	<1	2	2	8	5	<1	49	<50	<100	<100	<1	<1	<1	<1	<1	<1	<1	1	3	11	<1	<1	<1	<0.2	<0.2	<2	1	<0.1	<1	3	<1	<0.05	3	46

Concentrations in ug/L

RED = Exceeds GIL Criteria

DL3959

Table 3 - Soil RPD Results
Detailed Site Investigation
Landmark Square, Hurstville

Sample ID	Depth	Date	Report	BTEX					TRH				PAH	
				Benzene	Toluene	EthylBenzene	Xylene	Naphthalene	F1	F2	F3	F4	B(a)P TEQ	Total PAH
INTRA-LABORATORY														
BH7	0.5	15-Feb-17	162043	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	1.2	12
BH7A	0.5	15-Feb-17	162043	<0.2	<0.5	<1	<1	<1	<25	<50	260	<100	6.7	74
RPD				-	-	-	-	-	-	-	-	-	***139%***	***144%***
MW4	2.0	15-Feb-17	162043	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
MW4A	2.0	15-Feb-17	162043	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
RPD				-	-	-	-	-	-	-	-	-	-	-

Sample ID	Depth	Date	Report	Heavy Metals							
				As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY											
BH7	0.5	15-Feb-17	162043	5	3	22	28	69	<0.1	6	73
BH7A	0.5	15-Feb-17	162043	6	1	49	24	51	0.2	4	37
RPD				**18%**	***116%***	***76%***	**15%**	**30%**	**-**	***40%***	***65%***
MW4	2.0	15-Feb-17	162043	8	<0.4	56	<1	15	0.1	2	6
MW4A	2.0	15-Feb-17	162043	11	<0.4	61	<1	17	0.1	<1	8
RPD				***32%***	**-**	**9%**	**-**	**13%**	**0%**	**-**	**29%**

Table 4 - Groundwater RPD Results
Detailed Site Investigation
Landmark Square, Hurstville

Sample ID	Date	Report	BTEXN						TRH			
			Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Naphthalene	F1	F2	F3	F4
INTRA-LABORATORY												
MW1 (MW4)	23-Feb-17	162418	<1	1	2	7	4	<1	43	<50	<100	<100
MW1-A (MW4_A)	23-Feb-17	162418	<1	2	2	8	5	<1	49	<50	<100	<100
RPD			**NA**	***67%***	**0%**	**13%**	**22%**	**NA**	**13%**	**NA**	**NA**	**NA**

Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
MW1 (MW4)	23-Feb-17	162418	1	<0.1	<1	3	<1	<0.05	3	43
MW1-A (MW4_A)	23-Feb-17	162418	1	<0.1	<1	3	<1	<0.05	3	46
RPD			**0%**	**NA**	**NA**	**0%**	**NA**	**NA**	**0%**	**7%**

APPENDIX D – NATA CERTIFIED ANALYTICAL RESULTS

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 162043

Client:

DLA Environmental Services Pty Ltd
Unit 3, 38 Leighton Pl
Hornsby
NSW 2077

Attention: Matt Junghans

Sample log in details:

Your Reference:	**DL3959 - Hurstville**		
No. of samples:	23 soils		
Date samples received / completed instructions received	16/02/17	/	16/02/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	23/02/17	/	23/02/17
Date of Preliminary Report:	Not Issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

VOCs in soil Our Reference: Your Reference	UNITS ----------	162043-4 BH8	162043-6 BH9	162043-7 BH9	162043-8 BH9	162043-9 BH10
Depth	----------	0.4	0.4	0.8	1.5	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1	<1	<1
chloroform	mg/kg	<1	<1	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1	<1	<1
Ethylbenzene	mg/kg	<1	<1	1	6	<1
bromoform	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
styrene	mg/kg	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	2	<1	<1

VOCs in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	162043-4 BH8 0.4 15/02/2017 soil	162043-6 BH9 0.4 15/02/2017 soil	162043-7 BH9 0.8 15/02/2017 soil	162043-8 BH9 1.5 15/02/2017 soil	162043-9 BH10 0.5 15/02/2017 soil
o-Xylene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	15	10	<1
bromobenzene	mg/kg	<1	<1	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	37	27	<1
2-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1	13	<1
tert-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	11	36	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	15	9	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1	4	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	9	9	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Surrogate Dibromofluorometha	%	102	100	100	99	99
Surrogate aaa-Trifluorotoluene	%	106	100	97	100	103
Surrogate Toluene-d_8	%	99	99	99	99	101
Surrogate 4-Bromofluorobenzene	%	103	102	122	113	105

VOCs in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	162043-11 BH11 0.4 15/02/2017 soil	162043-16 BH13 0.7 15/02/2017 soil
Date extracted	-	17/02/2017	17/02/2017
Date analysed	-	21/02/2017	21/02/2017
Dichlorodifluoromethane	mg/kg	<1	<1
Chloromethane	mg/kg	<1	<1
Vinyl Chloride	mg/kg	<1	<1
Bromomethane	mg/kg	<1	<1
Chloroethane	mg/kg	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1
1,1-dichloroethane	mg/kg	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1
bromochloromethane	mg/kg	<1	<1
chloroform	mg/kg	<1	<1
2,2-dichloropropane	mg/kg	<1	<1
1,2-dichloroethane	mg/kg	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1
1,1-dichloropropene	mg/kg	<1	<1
Cyclohexane	mg/kg	<1	<1
carbon tetrachloride	mg/kg	<1	<1
Benzene	mg/kg	<0.2	<0.2
dibromomethane	mg/kg	<1	<1
1,2-dichloropropane	mg/kg	<1	<1
trichloroethene	mg/kg	<1	<1
bromodichloromethane	mg/kg	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1
Toluene	mg/kg	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1
dibromochloromethane	mg/kg	<1	<1
1,2-dibromoethane	mg/kg	<1	<1
tetrachloroethene	mg/kg	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1
chlorobenzene	mg/kg	<1	<1
Ethylbenzene	mg/kg	<1	<1
bromoform	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
styrene	mg/kg	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1
o-Xylene	mg/kg	<1	<1

VOCs in soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ---------- - ---------- 	162043-11 BH11 0.4 15/02/2017 soil	162043-16 BH13 0.7 15/02/2017 soil
1,2,3-trichloropropane	mg/kg	<1	<1
isopropylbenzene	mg/kg	<1	<1
bromobenzene	mg/kg	<1	<1
n-propyl benzene	mg/kg	<1	<1
2-chlorotoluene	mg/kg	<1	<1
4-chlorotoluene	mg/kg	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1
tert-butyl benzene	mg/kg	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1
sec-butyl benzene	mg/kg	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1
4-isopropyl toluene	mg/kg	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1
n-butyl benzene	mg/kg	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1
hexachlorobutadiene	mg/kg	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1
Surrogate Dibromofluorometha	%	99	100
Surrogate aaa-Trifluorotoluene	%	106	103
Surrogate Toluene-d_8	%	100	99
Surrogate 4-Bromofluorobenzene	%	104	103

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	162043-1	162043-2	162043-3	162043-4	162043-5
Your Reference	---------- -	BH7	BH7A	BH7	BH8	BH8
Depth	----------	0.5	0.5	1.5	0.4	2.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	21/02/2017	20/02/2017
TRHC6 - C9	mg/kg	<25	<25	<25	<25	140
TRHC6 - C10	mg/kg	<25	<25	63	<25	500
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	63	<25	500
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	97	95	106	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	162043-6	162043-7	162043-8	162043-9	162043-10
Your Reference	---------- -	BH9	BH9	BH9	BH10	BH10
Depth	----------	0.4	0.8	1.5	0.5	1.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	20/02/2017
TRHC6 - C9	mg/kg	<25	590	420	<25	<25
TRHC6 - C10	mg/kg	<25	2,300	1,500	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	2,300	1,500	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	1	6	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	6	5	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	97	100	103	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	162043-11	162043-12	162043-13	162043-14	162043-15
Your Reference	---------- -	BH11	BH11	BH12	BH12	BH13
Depth	----------	0.4	0.8	0.4	0.8	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	21/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	92	95	95	96

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	162043-16	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH13	BH14	BH15	BH16	MW4
Depth	----------	0.7	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	21/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	103	95	85	98	91

vTRH(C6-C10)/BTEXN in Soil				
Our Reference:	UNITS	162043-21	162043-22	162043-23
Your Reference	---------- -	MW4	MW4A	MW4
Depth	----------	2.0	2.0	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	82	98	90

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	162043-1	162043-2	162043-3	162043-4	162043-5
Your Reference	---------- -	BH7	BH7A	BH7	BH8	BH8
Depth	----------	0.5	0.5	1.5	0.4	2.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	18/02/2017	18/02/2017	18/02/2017	18/02/2017	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	64	<50	550
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	200	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	300
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	300
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	260	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	260	<50	<50	300
Surrogate o-Terphenyl	%	83	85	88	87	86

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	162043-6	162043-7	162043-8	162043-9	162043-10
Your Reference	---------- -	BH9	BH9	BH9	BH10	BH10
Depth	----------	0.4	0.8	1.5	0.5	1.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	18/02/2017	18/02/2017	18/02/2017	18/02/2017	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	960	1,300	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	530	690	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	530	680	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	530	690	<50	<50
Surrogate o-Terphenyl	%	86	90	88	85	87

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	162043-11	162043-12	162043-13	162043-14	162043-15
Your Reference	---------- -	BH11	BH11	BH12	BH12	BH13
Depth	----------	0.4	0.8	0.4	0.8	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	18/02/2017	18/02/2017	18/02/2017	18/02/2017	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	86	84	84	86	85

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	162043-16	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH13	BH14	BH15	BH16	MW4
Depth	----------	0.7	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	18/02/2017	18/02/2017	18/02/2017	18/02/2017	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	87	85	85	84	85

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	162043-21	162043-22	162043-23
Your Reference	----------	MW4	MW4A	MW4
Depth	- ----------	2.0	2.0	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	18/02/2017	18/02/2017	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	84	84	83

PAHs in Soil Our Reference: Your Reference	UNITS ----------	162043-1 BH7	162043-2 BH7A	162043-3 BH7	162043-4 BH8	162043-5 BH8
Depth	-	0.5	0.5	1.5	0.4	2.0
Date Sampled	----------	15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Naphthalene	mg/kg	<0.1	0.2	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	0.3	1.8	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	1.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	1.4	12	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.5	3.4	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	2.3	15	<0.1	<0.1	<0.1
Pyrene	mg/kg	2.0	13	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	1.0	6.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.9	5.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	1	7.5	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.78	4.4	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	2.0	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	0.6	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	2.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.2	6.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.2	6.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.2	6.7	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	12	74	<0.05	<0.05	0.1
Surrogate p-Terphenyl-d14	%	85	79	92	87	87

PAHs in Soil Our Reference: Your Reference	UNITS ----------	162043-6 BH9	162043-7 BH9	162043-8 BH9	162043-9 BH10	162043-10 BH10
Depth	----------	0.4	0.8	1.5	0.5	1.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Naphthalene	mg/kg	<0.1	2.0	2.8	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	0.2	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	0.2	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	0.08	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	0.2	2.0	2.8	0.72	<0.05
Surrogate p-Terphenyl-d14	%	89	83	84	79	84

PAHs in Soil Our Reference: Your Reference	UNITS ---------- -	162043-11 BH11	162043-12 BH11	162043-13 BH12	162043-14 BH12	162043-15 BH13
Depth	----------	0.4	0.8	0.4	0.8	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	0.2	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	<0.1	0.3	<0.1	0.3
Pyrene	mg/kg	0.3	<0.1	0.2	<0.1	0.3
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.1	<0.05	0.07	<0.05	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	1.8	<0.05	0.86	<0.05	0.90
Surrogate p-Terphenyl-d14	%	84	87	83	86	79

PAHs in Soil Our Reference: Your Reference	UNITS ---------- -	162043-16 BH13	162043-17 BH14	162043-18 BH15	162043-19 BH16	162043-20 MW4
Depth	----------	0.7	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.6	<0.1	0.5	0.5
Anthracene	mg/kg	<0.1	0.2	<0.1	0.1	0.2
Fluoranthene	mg/kg	<0.1	1.1	0.2	0.7	0.7
Pyrene	mg/kg	<0.1	1.1	0.2	0.7	0.6
Benzo(a)anthracene	mg/kg	<0.1	0.5	<0.1	0.3	0.2
Chrysene	mg/kg	<0.1	0.6	<0.1	0.3	0.3
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.9	<0.2	0.5	0.5
Benzo(a)pyrene	mg/kg	<0.05	0.5	0.07	0.3	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.3	<0.1	0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.3	<0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.7	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	6.2	0.4	3.7	3.4
Surrogate p-Terphenyl-d14	%	88	83	81	83	82

PAHs in Soil Our Reference: Your Reference	UNITS ---------- -	162043-21 MW4	162043-22 MW4A	162043-23 MW4
Depth	----------	2.0	2.0	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	83	79	81

Organochlorine Pesticides in soil						
Our Reference:	UNITS	162043-1	162043-2	162043-4	162043-6	162043-7
Your Reference	----------	BH7	BH7A	BH8	BH9	BH9
	-					
Depth	----------	0.5	0.5	0.4	0.4	0.8
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	95	109	97	115

Organochlorine Pesticides in soil						
Our Reference:	UNITS	162043-8	162043-9	162043-11	162043-13	162043-15
Your Reference	---------- -	BH9	BH10	BH11	BH12	BH13
Depth	----------	1.5	0.5	0.4	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	94	97	96	93

Organochlorine Pesticides in soil					
Our Reference:	UNITS	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH14	BH15	BH16	MW4
Depth	----------	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	95	97	95

Organophosphorus Pesticides						
Our Reference:	UNITS	162043-1	162043-2	162043-4	162043-6	162043-7
Your Reference	---------- -	BH7	BH7A	BH8	BH9	BH9
Depth	----------	0.5	0.5	0.4	0.4	0.8
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	95	109	97	115

Organophosphorus Pesticides						
Our Reference:	UNITS	162043-8	162043-9	162043-11	162043-13	162043-15
Your Reference	---------- -	BH9	BH10	BH11	BH12	BH13
Depth	----------	1.5	0.5	0.4	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	94	97	96	93

Organophosphorus Pesticides					
Our Reference:	UNITS	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH14	BH15	BH16	MW4
Depth	----------	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	95	97	95

PCBs in Soil						
Our Reference:	UNITS	162043-1	162043-2	162043-4	162043-6	162043-7
Your Reference	----------	BH7	BH7A	BH8	BH9	BH9
	-					
Depth	----------	0.5	0.5	0.4	0.4	0.8
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Aroclor 1016	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.5	<0.1	<0.1	<0.1
Surrogate TCLMX	%	95	95	109	97	115

PCBs in Soil						
Our Reference:	UNITS	162043-8	162043-9	162043-11	162043-13	162043-15
Your Reference	----------	BH9	BH10	BH11	BH12	BH13
	-					
Depth	----------	1.5	0.5	0.4	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	94	97	96	93

PCBs in Soil					
Our Reference:	UNITS	162043-17	162043-18	162043-19	162043-20
Your Reference	----------	BH14	BH15	BH16	MW4
Depth	- ----------	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil
Date extracted	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	95	97	95

Acid Extractable metals in soil						
Our Reference:	UNITS	162043-1	162043-2	162043-3	162043-4	162043-5
Your Reference	----------	BH7	BH7A	BH7	BH8	BH8
	-					
Depth	----------	0.5	0.5	1.5	0.4	2.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	5	6	6	8	<4
Cadmium	mg/kg	3	0.8	<0.4	2	<0.4
Chromium	mg/kg	22	49	38	60	26
Copper	mg/kg	28	24	<1	26	<1
Lead	mg/kg	69	51	12	67	8
Mercury	mg/kg	<0.1	0.2	0.2	0.1	0.2
Nickel	mg/kg	6	4	<1	5	1
Zinc	mg/kg	73	37	1	55	1

Acid Extractable metals in soil						
Our Reference:	UNITS	162043-6	162043-7	162043-8	162043-9	162043-10
Your Reference	----------	BH9	BH9	BH9	BH10	BH10
	-					
Depth	----------	0.4	0.8	1.5	0.5	1.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	7	5	<4	14	7
Cadmium	mg/kg	24	0.8	<0.4	<0.4	<0.4
Chromium	mg/kg	65	45	35	53	49
Copper	mg/kg	42	<1	<1	19	<1
Lead	mg/kg	97	10	10	73	14
Mercury	mg/kg	0.2	<0.1	<0.1	0.2	<0.1
Nickel	mg/kg	20	2	<1	4	2
Zinc	mg/kg	130	4	<1	85	2

Acid Extractable metals in soil						
Our Reference:	UNITS	162043-11	162043-12	162043-13	162043-14	162043-15
Your Reference	---------- -	BH11	BH11	BH12	BH12	BH13
Depth	----------	0.4	0.8	0.4	0.8	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	86	6	5	<4	7
Cadmium	mg/kg	9.6	<0.4	<0.4	<0.4	0.6
Chromium	mg/kg	42	43	44	53	20
Copper	mg/kg	370	13	15	<1	180
Lead	mg/kg	320	24	16	8	770
Mercury	mg/kg	0.4	<0.1	<0.1	<0.1	0.3
Nickel	mg/kg	6	3	16	4	38
Zinc	mg/kg	410	18	20	4	410

Acid Extractable metals in soil						
Our Reference:	UNITS	162043-16	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH13	BH14	BH15	BH16	MW4
Depth	----------	0.7	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	9	7	7	<4	5
Cadmium	mg/kg	<0.4	0.6	<0.4	<0.4	<0.4
Chromium	mg/kg	60	27	29	37	52
Copper	mg/kg	4	60	20	10	8
Lead	mg/kg	23	200	71	29	31
Mercury	mg/kg	<0.1	0.4	0.1	<0.1	<0.1
Nickel	mg/kg	5	7	4	3	3
Zinc	mg/kg	10	150	50	44	28

Acid Extractable metals in soil					
Our Reference:	UNITS	162043-21	162043-22	162043-23	162043-24
Your Reference	---------- -	MW4	MW4A	MW4	BH8 - [TRIPLICATE]
Depth	----------	2.0	2.0	2.4	0.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	8	11	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	9.5
Chromium	mg/kg	56	61	19	58
Copper	mg/kg	<1	<1	3	18
Lead	mg/kg	15	17	8	68
Mercury	mg/kg	0.1	0.1	<0.1	0.1
Nickel	mg/kg	2	<1	1	7
Zinc	mg/kg	6	8	1	56

Moisture						
Our Reference:	UNITS	162043-1	162043-2	162043-3	162043-4	162043-5
Your Reference	---------- -	BH7	BH7A	BH7	BH8	BH8
Depth	----------	0.5	0.5	1.5	0.4	2.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Moisture	%	16	14	17	26	19

Moisture						
Our Reference:	UNITS	162043-6	162043-7	162043-8	162043-9	162043-10
Your Reference	---------- -	BH9	BH9	BH9	BH10	BH10
Depth	----------	0.4	0.8	1.5	0.5	1.0
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Moisture	%	19	26	19	20	22

Moisture						
Our Reference:	UNITS	162043-11	162043-12	162043-13	162043-14	162043-15
Your Reference	---------- -	BH11	BH11	BH12	BH12	BH13
Depth	----------	0.4	0.8	0.4	0.8	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Moisture	%	11	14	18	25	20

Moisture						
Our Reference:	UNITS	162043-16	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH13	BH14	BH15	BH16	MW4
Depth	----------	0.7	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Moisture	%	25	13	14	7.8	22

Moisture				
Our Reference:	UNITS	162043-21	162043-22	162043-23
Your Reference	----------	MW4	MW4A	MW4
	-			
Depth	----------	2.0	2.0	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date prepared	-	17/02/2017	17/02/2017	17/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017
Moisture	%	15	16	19

Asbestos ID - soils						
Our Reference:	UNITS	162043-1	162043-2	162043-4	162043-6	162043-7
Your Reference	---------- -	BH7	BH7A	BH8	BH9	BH9
Depth	----------	0.5	0.5	0.4	0.4	0.8
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	22/02/2017	22/02/2017	22/02/2017	22/02/2017	22/02/2017
Sample mass tested	g	Approx. 45g	Approx. 50g	Approx. 40g	Approx. 40g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference:	UNITS	162043-8	162043-9	162043-11	162043-13	162043-15
Your Reference	---------- -	BH9	BH10	BH11	BH12	BH13
Depth	----------	1.5	0.5	0.4	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	22/02/2017	22/02/2017	22/02/2017	22/02/2017	22/02/2017
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 25g	Approx. 45g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown sandy soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference:	UNITS	162043-17	162043-18	162043-19	162043-20
Your Reference	---------- -	BH14	BH15	BH16	MW4
Depth	----------	0.3	0.5	0.4	0.5
Date Sampled		15/02/2017	15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil	soil
Date analysed	-	22/02/2017	22/02/2017	22/02/2017	22/02/2017
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 35g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil				
Our Reference:	UNITS	162043-3	162043-14	162043-23
Your Reference	---------- -	BH7	BH12	MW4
Depth	----------	1.5	0.8	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017
pH 1:5 soil:water	pH Units	5.6	7.1	4.4
Electrical Conductivity 1:5 soil:water	µS/cm	42	75	62

CEC Our Reference: Your Reference	UNITS ---------- -	162043-3 BH7	162043-14 BH12	162043-23 MW4
Depth	----------	1.5	0.8	2.4
Date Sampled		15/02/2017	15/02/2017	15/02/2017
Type of sample		soil	soil	soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017
Exchangeable Ca	meq/100g	7.6	6.5	<0.1
Exchangeable K	meq/100g	0.3	0.2	0.2
Exchangeable Mg	meq/100g	2.3	7.1	0.76
Exchangeable Na	meq/100g	<0.1	0.13	<0.1
Cation Exchange Capacity	meq/100g	10	14	1.1

Method ID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			21/02/2017	162043-4	21/02/2017 || 21/02/2017	LCS-1	21/02/2017
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Chloromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Vinyl Chloride	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Bromomethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Chloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,1-dichloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	84%
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
bromochloromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
chloroform	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	103%
2,2-dichloropropane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2-dichloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	98%
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	80%
1,1-dichloropropene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Cyclohexane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
carbon tetrachloride	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Benzene	mg/kg	0.2	Org-014	<0.2	162043-4	<0.2 || <0.2	[NR]	[NR]
dibromomethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2-dichloropropane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
trichloroethene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	89%
bromodichloromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	107%
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Toluene	mg/kg	0.5	Org-014	<0.5	162043-4	<0.5 || <0.5	[NR]	[NR]
1,3-dichloropropane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
dibromochloromethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	111%
1,2-dibromoethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
tetrachloroethene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	LCS-1	102%
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
chlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Ethylbenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
bromoform	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
m+p-xylene	mg/kg	2	Org-014	<2	162043-4	<2 || <2	[NR]	[NR]
styrene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
o-Xylene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
isopropylbenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
bromobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
n-propyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
2-chlorotoluene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
4-chlorotoluene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
tert-butyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
sec-butyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
4-isopropyl toluene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
n-butyl benzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
hexachlorobutadiene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Surrogate Dibromofluorometha	%		Org-014	102	162043-4	102 || 101 || RPD: 1	LCS-1	101%
Surrogate aaa-Trifluorotoluene	%		Org-014	102	162043-4	106 || 103 || RPD: 3	LCS-1	109%
Surrogate Toluene-d_8	%		Org-014	98	162043-4	99 || 99 || RPD: 0	LCS-1	100%
Surrogate 4-Bromofluorobenzene	%		Org-014	101	162043-4	103 || 105 || RPD: 2	LCS-1	105%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			21/02/2017	162043-4	21/02/2017 || 21/02/2017	LCS-1	21/02/2017
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	162043-4	<25 || <25	LCS-1	109%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	162043-4	<25 || <25	LCS-1	109%
Benzene	mg/kg	0.2	Org-016	<0.2	162043-4	<0.2 || <0.2	LCS-1	92%
Toluene	mg/kg	0.5	Org-016	<0.5	162043-4	<0.5 || <0.5	LCS-1	103%
Ethylbenzene	mg/kg	1	Org-016	<1	162043-4	<1 || <1	LCS-1	117%
m+p-xylene	mg/kg	2	Org-016	<2	162043-4	<2 || <2	LCS-1	117%
o-Xylene	mg/kg	1	Org-016	<1	162043-4	<1 || <1	LCS-1	118%
naphthalene	mg/kg	1	Org-014	<1	162043-4	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	102	162043-4	106 || 103 || RPD: 3	LCS-1	109%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			18/02/2017	162043-4	18/02/2017 || 18/02/2017	LCS-1	18/02/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	162043-4	<50 || <50	LCS-1	113%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	162043-4	<100 || <100	LCS-1	107%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	162043-4	<100 || <100	LCS-1	106%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	162043-4	<50 || <50	LCS-1	113%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	162043-4	<100 || <100	LCS-1	107%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	162043-4	<100 || <100	LCS-1	106%
Surrogate o-Terphenyl	%		Org-003	86	162043-4	87 || 87 || RPD: 0	LCS-1	102%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	91%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	97%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	103%
Anthracene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	102%
Pyrene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	103%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	LCS-1	95%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012	<0.2	162043-4	<0.2 || <0.2	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	162043-4	<0.05 || <0.05	LCS-1	85%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	93	162043-4	87 || 84 || RPD: 4	LCS-1	113%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
HCB	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	102%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	124%
Heptachlor	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	111%
delta-BHC	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	106%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	109%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	118%
Dieldrin	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	117%
Endrin	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	107%
pp-DDD	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	116%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	LCS-1	110%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	98	162043-4	109 || 101 || RPD: 8	LCS-1	123%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	86%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	75%
Dimethoate	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	89%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	90%
Malathion	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	92%
Parathion	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	86%
Ronnel	mg/kg	0.1	Org-008	<0.1	162043-4	<0.1 || <0.1	LCS-1	81%
Surrogate TCMX	%		Org-008	98	162043-4	109 || 101 || RPD: 8	LCS-1	97%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	LCS-1	100%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	162043-4	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	98	162043-4	109 || 101 || RPD: 8	LCS-1	97%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			17/02/2017	162043-4	17/02/2017 || 17/02/2017	LCS-1	17/02/2017
Date analysed	-			20/02/2017	162043-4	20/02/2017 || 20/02/2017	LCS-1	20/02/2017
Arsenic	mg/kg	4	Metals-020	<4	162043-4	8 || 8 || RPD: 0	LCS-1	117%
Cadmium	mg/kg	0.4	Metals-020	<0.4	162043-4	2 || 5.9 || RPD: 99	LCS-1	102%
Chromium	mg/kg	1	Metals-020	<1	162043-4	60 || 49 || RPD: 20	LCS-1	113%
Copper	mg/kg	1	Metals-020	<1	162043-4	26 || 25 || RPD: 4	LCS-1	114%
Lead	mg/kg	1	Metals-020	<1	162043-4	67 || 70 || RPD: 4	LCS-1	107%
Mercury	mg/kg	0.1	Metals-021	<0.1	162043-4	0.1 || 0.1 || RPD: 0	LCS-1	96%
Nickel	mg/kg	1	Metals-020	<1	162043-4	5 || 7 || RPD: 33	LCS-1	103%
Zinc	mg/kg	1	Metals-020	<1	162043-4	55 || 70 || RPD: 24	LCS-1	105%

QUALITY CONTROL Misc Inorg - Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			20/02/2017	[NT]	[NT]	LCS-1	20/02/2017
Date analysed	-			20/02/2017	[NT]	[NT]	LCS-1	20/02/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	102%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-1	102%

QUALITY CONTROL CEC	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			20/02/2017	[NT]	[NT]	LCS-1	20/02/2017
Date analysed	-			20/02/2017	[NT]	[NT]	LCS-1	20/02/2017
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	107%
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	118%
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	111%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-17	17/02/2017 || 17/02/2017	LCS-2	17/02/2017
Date analysed	-	162043-17	20/02/2017 || 20/02/2017	LCS-2	20/02/2017
TRHC$_6$ - C$_9$	mg/kg	162043-17	<25 || <25	LCS-2	118%
TRHC$_6$ - C$_{10}$	mg/kg	162043-17	<25 || <25	LCS-2	118%
Benzene	mg/kg	162043-17	<0.2 || <0.2	LCS-2	104%
Toluene	mg/kg	162043-17	<0.5 || <0.5	LCS-2	116%
Ethylbenzene	mg/kg	162043-17	<1 || <1	LCS-2	122%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
m+p-xylene	mg/kg	162043-17	<2 || <2	LCS-2	124%
o-Xylene	mg/kg	162043-17	<1 || <1	LCS-2	125%
naphthalene	mg/kg	162043-17	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	162043-17	95 || 105 || RPD: 10	LCS-2	114%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-17	17/02/2017 || 17/02/2017	LCS-2	17/02/2017
Date analysed	-	162043-17	18/02/2017 || 18/02/2017	LCS-2	18/02/2017
TRH C_{10} - C_{14}	mg/kg	162043-17	<50 || <50	LCS-2	111%
TRH C_{15} - C_{28}	mg/kg	162043-17	<100 || <100	LCS-2	106%
TRH C_{29} - C_{36}	mg/kg	162043-17	<100 || <100	LCS-2	106%
TRH >C_{10}-C_{16}	mg/kg	162043-17	<50 || <50	LCS-2	111%
TRH >C_{16}-C_{34}	mg/kg	162043-17	<100 || <100	LCS-2	106%
TRH >C_{34}-C_{40}	mg/kg	162043-17	<100 || <100	LCS-2	106%
Surrogate o-Terphenyl	%	162043-17	85 || 84 || RPD: 1	LCS-2	100%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-17	17/02/2017 || 17/02/2017	LCS-2	17/02/2017
Date analysed	-	162043-17	17/02/2017 || 17/02/2017	LCS-2	17/02/2017
Naphthalene	mg/kg	162043-17	<0.1 || <0.1	LCS-2	92%
Acenaphthylene	mg/kg	162043-17	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Acenaphthene	mg/kg	162043-17	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	162043-17	<0.1 || <0.1	LCS-2	99%
Phenanthrene	mg/kg	162043-17	0.6 || 1.0 || RPD: 50	LCS-2	105%
Anthracene	mg/kg	162043-17	0.2 || 0.3 || RPD: 40	[NR]	[NR]
Fluoranthene	mg/kg	162043-17	1.1 || 1.6 || RPD: 37	LCS-2	106%
Pyrene	mg/kg	162043-17	1.1 || 1.5 || RPD: 31	LCS-2	107%
Benzo(a)anthracene	mg/kg	162043-17	0.5 || 0.6 || RPD: 18	[NR]	[NR]
Chrysene	mg/kg	162043-17	0.6 || 0.7 || RPD: 15	LCS-2	96%
Benzo(b,j+k)fluoranthene	mg/kg	162043-17	0.9 || 1 || RPD: 11	[NR]	[NR]
Benzo(a)pyrene	mg/kg	162043-17	0.5 || 0.57 || RPD: 13	LCS-2	80%
Indeno(1,2,3-c,d)pyrene	mg/kg	162043-17	0.3 || 0.3 || RPD: 0	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	162043-17	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	162043-17	0.3 || 0.3 || RPD: 0	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	162043-17	83 || 85 || RPD: 2	LCS-2	118%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	162043-17	17/02/2017 || 17/02/2017
Date analysed	-	162043-17	17/02/2017 || 17/02/2017
HCB	mg/kg	162043-17	<0.1 || <0.1
alpha-BHC	mg/kg	162043-17	<0.1 || <0.1
gamma-BHC	mg/kg	162043-17	<0.1 || <0.1
beta-BHC	mg/kg	162043-17	<0.1 || <0.1
Heptachlor	mg/kg	162043-17	<0.1 || <0.1
delta-BHC	mg/kg	162043-17	<0.1 || <0.1
Aldrin	mg/kg	162043-17	<0.1 || <0.1
Heptachlor Epoxide	mg/kg	162043-17	<0.1 || <0.1
gamma-Chlordane	mg/kg	162043-17	<0.1 || <0.1
alpha-chlordane	mg/kg	162043-17	<0.1 || <0.1
Endosulfan I	mg/kg	162043-17	<0.1 || <0.1
pp-DDE	mg/kg	162043-17	<0.1 || <0.1
Dieldrin	mg/kg	162043-17	<0.1 || <0.1
Endrin	mg/kg	162043-17	<0.1 || <0.1
pp-DDD	mg/kg	162043-17	<0.1 || <0.1
Endosulfan II	mg/kg	162043-17	<0.1 || <0.1
pp-DDT	mg/kg	162043-17	<0.1 || <0.1
Endrin Aldehyde	mg/kg	162043-17	<0.1 || <0.1
Endosulfan Sulphate	mg/kg	162043-17	<0.1 || <0.1
Methoxychlor	mg/kg	162043-17	<0.1 || <0.1
Surrogate TCMX	%	162043-17	97 || 96 || RPD: 1

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	162043-17	17/02/2017 || 17/02/2017
Date analysed	-	162043-17	17/02/2017 || 17/02/2017
Azinphos-methyl (Guthion)	mg/kg	162043-17	<0.1 || <0.1
Bromophos-ethyl	mg/kg	162043-17	<0.1 || <0.1
Chlorpyriphos	mg/kg	162043-17	<0.1 || <0.1
Chlorpyriphos-methyl	mg/kg	162043-17	<0.1 || <0.1
Diazinon	mg/kg	162043-17	<0.1 || <0.1
Dichlorvos	mg/kg	162043-17	<0.1 || <0.1
Dimethoate	mg/kg	162043-17	<0.1 || <0.1
Ethion	mg/kg	162043-17	<0.1 || <0.1
Fenitrothion	mg/kg	162043-17	<0.1 || <0.1
Malathion	mg/kg	162043-17	<0.1 || <0.1
Parathion	mg/kg	162043-17	<0.1 || <0.1
Ronnel	mg/kg	162043-17	<0.1 || <0.1
Surrogate TCMX	%	162043-17	97 || 96 || RPD: 1

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	162043-17	17/02/2017 || 17/02/2017
Date analysed	-	162043-17	17/02/2017 || 17/02/2017
Aroclor 1016	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1221	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1232	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1242	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1248	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1254	mg/kg	162043-17	<0.1 || <0.1
Aroclor 1260	mg/kg	162043-17	<0.1 || <0.1
Surrogate TCLMX	%	162043-17	97 || 96 || RPD: 1

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	162043-17	17/02/2017 || 17/02/2017	LCS-2	17/02/2017
Date analysed	-	162043-17	20/02/2017 || 20/02/2017	LCS-2	20/02/2017
Arsenic	mg/kg	162043-17	7 || 7 || RPD: 0	LCS-2	115%
Cadmium	mg/kg	162043-17	0.6 || 0.7 || RPD: 15	LCS-2	101%
Chromium	mg/kg	162043-17	27 || 24 || RPD: 12	LCS-2	111%
Copper	mg/kg	162043-17	60 || 61 || RPD: 2	LCS-2	113%
Lead	mg/kg	162043-17	200 || 240 || RPD: 18	LCS-2	105%
Mercury	mg/kg	162043-17	0.4 || 0.6 || RPD: 40	LCS-2	91%
Nickel	mg/kg	162043-17	7 || 7 || RPD: 0	LCS-2	102%
Zinc	mg/kg	162043-17	150 || 160 || RPD: 6	LCS-2	103%

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-6	17/02/2017
Date analysed	-	[NT]	[NT]	162043-6	21/02/2017
Dichlorodifluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Vinyl Chloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Chloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Trichlorofluoromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-Dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
trans-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1-dichloroethane	mg/kg	[NT]	[NT]	162043-6	76%
cis-1,2-dichloroethene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromochloromethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chloroform	mg/kg	[NT]	[NT]	162043-6	88%
2,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloroethane	mg/kg	[NT]	[NT]	162043-6	89%
1,1,1-trichloroethane	mg/kg	[NT]	[NT]	162043-6	80%
1,1-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
Cyclohexane	mg/kg	[NT]	[NT]	[NR]	[NR]
carbon tetrachloride	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromomethane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
trichloroethene	mg/kg	[NT]	[NT]	162043-6	81%
bromodichloromethane	mg/kg	[NT]	[NT]	162043-6	96%
trans-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
cis-1,3-dichloropropene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2-trichloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
Toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
dibromochloromethane	mg/kg	[NT]	[NT]	162043-6	99%
1,2-dibromoethane	mg/kg	[NT]	[NT]	[NR]	[NR]
tetrachloroethene	mg/kg	[NT]	[NT]	162043-6	92%
1,1,1,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
chlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromoform	mg/kg	[NT]	[NT]	[NR]	[NR]
m+p-xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
styrene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,1,2,2-tetrachloroethane	mg/kg	[NT]	[NT]	[NR]	[NR]
o-Xylene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL VOCs in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
isopropylbenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
bromobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-propyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
2-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-chlorotoluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3,5-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
tert-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trimethyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,3-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
sec-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,4-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
4-isopropyl toluene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
n-butyl benzene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2-dibromo-3-chloropropane	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,4-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
hexachlorobutadiene	mg/kg	[NT]	[NT]	[NR]	[NR]
1,2,3-trichlorobenzene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate Dibromofluorometha	%	[NT]	[NT]	162043-6	102%
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	162043-6	106%
Surrogate Toluene-d_8	%	[NT]	[NT]	162043-6	100%
Surrogate 4-Bromofluorobenzene	%	[NT]	[NT]	162043-6	103%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-22	17/02/2017 || 17/02/2017	162043-6	17/02/2017
Date analysed	-	162043-22	20/02/2017 || 20/02/2017	162043-6	21/02/2017
$TRHC_6$ - C_9	mg/kg	162043-22	<25 || <25	162043-6	98%
$TRHC_6$ - C_{10}	mg/kg	162043-22	<25 || <25	162043-6	98%
Benzene	mg/kg	162043-22	<0.2 || <0.2	162043-6	84%
Toluene	mg/kg	162043-22	<0.5 || <0.5	162043-6	92%
Ethylbenzene	mg/kg	162043-22	<1 || <1	162043-6	105%
m+p-xylene	mg/kg	162043-22	<2 || <2	162043-6	104%
o-Xylene	mg/kg	162043-22	<1 || <1	162043-6	106%
naphthalene	mg/kg	162043-22	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	162043-22	98 || 91 || RPD: 7	162043-6	106%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-22	17/02/2017 || 17/02/2017	162043-6	17/02/2017
Date analysed	-	162043-22	18/02/2017 || 18/02/2017	162043-6	18/02/2017
$TRHC_{10}$ - C_{14}	mg/kg	162043-22	<50 || <50	162043-6	111%
$TRHC_{15}$ - C_{28}	mg/kg	162043-22	<100 || <100	162043-6	107%
$TRHC_{29}$ - C_{36}	mg/kg	162043-22	<100 || <100	162043-6	94%
$TRH>C_{10}$-C_{16}	mg/kg	162043-22	<50 || <50	162043-6	111%
$TRH>C_{16}$-C_{34}	mg/kg	162043-22	<100 || <100	162043-6	107%
$TRH>C_{34}$-C_{40}	mg/kg	162043-22	<100 || <100	162043-6	94%
Surrogate o-Terphenyl	%	162043-22	84 || 84 || RPD: 0	162043-6	86%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-22	17/02/2017 || 17/02/2017	162043-6	17/02/2017
Date analysed	-	162043-22	17/02/2017 || 17/02/2017	162043-6	17/02/2017
Naphthalene	mg/kg	162043-22	<0.1 || <0.1	162043-6	89%
Acenaphthylene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	162043-22	<0.1 || <0.1	162043-6	92%
Phenanthrene	mg/kg	162043-22	<0.1 || <0.1	162043-6	90%
Anthracene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	162043-22	<0.1 || <0.1	162043-6	89%
Pyrene	mg/kg	162043-22	<0.1 || <0.1	162043-6	95%
Benzo(a)anthracene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	162043-22	<0.1 || <0.1	162043-6	87%
Benzo(b,j+k)fluoranthene	mg/kg	162043-22	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	162043-22	<0.05 || <0.05	162043-6	75%
Indeno(1,2,3-c,d)pyrene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	162043-22	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	162043-22	79 || 82 || RPD: 4	162043-6	110%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-6	17/02/2017
Date analysed	-	[NT]	[NT]	162043-6	17/02/2017
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	162043-6	118%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	162043-6	129%
Heptachlor	mg/kg	[NT]	[NT]	162043-6	113%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	162043-6	109%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	162043-6	112%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	162043-6	118%
Dieldrin	mg/kg	[NT]	[NT]	162043-6	110%
Endrin	mg/kg	[NT]	[NT]	162043-6	95%
pp-DDD	mg/kg	[NT]	[NT]	162043-6	116%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	162043-6	106%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	162043-6	128%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-6	17/02/2017
Date analysed	-	[NT]	[NT]	162043-6	17/02/2017
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	162043-6	84%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	162043-6	81%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	162043-6	81%
Fenitrothion	mg/kg	[NT]	[NT]	162043-6	87%
Malathion	mg/kg	[NT]	[NT]	162043-6	78%
Parathion	mg/kg	[NT]	[NT]	162043-6	73%
Ronnel	mg/kg	[NT]	[NT]	162043-6	79%
Surrogate TCMX	%	[NT]	[NT]	162043-6	98%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-6	17/02/2017
Date analysed	-	[NT]	[NT]	162043-6	17/02/2017
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	162043-6	101%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	162043-6	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	162043-22	17/02/2017 || 17/02/2017	162043-6	17/02/2017
Date analysed	-	162043-22	20/02/2017 || 20/02/2017	162043-6	20/02/2017
Arsenic	mg/kg	162043-22	11 || 11 || RPD: 0	162043-6	88%
Cadmium	mg/kg	162043-22	<0.4 || <0.4	162043-6	84%
Chromium	mg/kg	162043-22	61 || 63 || RPD: 3	162043-6	89%
Copper	mg/kg	162043-22	<1 || <1	162043-6	100%
Lead	mg/kg	162043-22	17 || 18 || RPD: 6	162043-6	121%
Mercury	mg/kg	162043-22	0.1 || 0.1 || RPD: 0	162043-6	83%
Nickel	mg/kg	162043-22	<1 || 1	162043-6	83%
Zinc	mg/kg	162043-22	8 || 11 || RPD: 32	162043-6	82%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-23	17/02/2017
Date analysed	-	[NT]	[NT]	162043-23	20/02/2017
TRHC6 - C9	mg/kg	[NT]	[NT]	162043-23	84%
TRHC6 - C10	mg/kg	[NT]	[NT]	162043-23	84%
Benzene	mg/kg	[NT]	[NT]	162043-23	73%
Toluene	mg/kg	[NT]	[NT]	162043-23	82%
Ethylbenzene	mg/kg	[NT]	[NT]	162043-23	87%
m+p-xylene	mg/kg	[NT]	[NT]	162043-23	90%
o-Xylene	mg/kg	[NT]	[NT]	162043-23	91%
naphthalene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	162043-23	86%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162043-23	17/02/2017
Date analysed	-	[NT]	[NT]	162043-23	18/02/2017
TRHC10 - C14	mg/kg	[NT]	[NT]	162043-23	115%
TRHC15 - C28	mg/kg	[NT]	[NT]	162043-23	106%
TRHC29 - C36	mg/kg	[NT]	[NT]	162043-23	104%
TRH>C10-C16	mg/kg	[NT]	[NT]	162043-23	115%
TRH>C16-C34	mg/kg	[NT]	[NT]	162043-23	106%
TRH>C34-C40	mg/kg	[NT]	[NT]	162043-23	104%
Surrogate o-Terphenyl	%	[NT]	[NT]	162043-23	83%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	162043-1	17/02/2017 || 17/02/2017	162043-23	17/02/2017
Date analysed	-	162043-1	17/02/2017 || 17/02/2017	162043-23	17/02/2017
Naphthalene	mg/kg	162043-1	<0.1 || <0.1	162043-23	89%
Acenaphthylene	mg/kg	162043-1	0.3 || 0.2 || RPD: 40	[NR]	[NR]
Acenaphthene	mg/kg	162043-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	162043-1	<0.1 || <0.1	162043-23	92%
Phenanthrene	mg/kg	162043-1	1.4 || 1.5 || RPD: 7	162043-23	93%
Anthracene	mg/kg	162043-1	0.5 || 0.5 || RPD: 0	[NR]	[NR]
Fluoranthene	mg/kg	162043-1	2.3 || 2.5 || RPD: 8	162043-23	93%
Pyrene	mg/kg	162043-1	2.0 || 2.4 || RPD: 18	162043-23	98%
Benzo(a)anthracene	mg/kg	162043-1	1.0 || 1.2 || RPD: 18	[NR]	[NR]
Chrysene	mg/kg	162043-1	0.9 || 0.9 || RPD: 0	162043-23	89%
Benzo(b,j+k)fluoranthene	mg/kg	162043-1	1 || 2 || RPD: 67	[NR]	[NR]
Benzo(a)pyrene	mg/kg	162043-1	0.78 || 0.91 || RPD: 15	162043-23	70%
Indeno(1,2,3-c,d)pyrene	mg/kg	162043-1	0.4 || 0.6 || RPD: 40	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	162043-1	0.1 || 0.2 || RPD: 67	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	162043-1	0.4 || 0.5 || RPD: 22	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	162043-1	85 || 96 || RPD: 12	162043-23	111%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	162043-23	17/02/2017
Date analysed	-	[NT]	[NT]	162043-23	20/02/2017
Arsenic	mg/kg	[NT]	[NT]	162043-23	103%
Cadmium	mg/kg	[NT]	[NT]	162043-23	92%
Chromium	mg/kg	[NT]	[NT]	162043-23	121%
Copper	mg/kg	[NT]	[NT]	162043-23	111%
Lead	mg/kg	[NT]	[NT]	162043-23	98%
Mercury	mg/kg	[NT]	[NT]	162043-23	103%
Nickel	mg/kg	[NT]	[NT]	162043-23	97%
Zinc	mg/kg	[NT]	[NT]	162043-23	96%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	162043-2	17/02/2017 || 17/02/2017
Date analysed	-	162043-2	17/02/2017 || 17/02/2017
Naphthalene	mg/kg	162043-2	0.2 || 0.3 || RPD: 40
Acenaphthylene	mg/kg	162043-2	1.8 || 1.0 || RPD: 57
Acenaphthene	mg/kg	162043-2	0.1 || 0.1 || RPD: 0
Fluorene	mg/kg	162043-2	1.1 || 0.6 || RPD: 59
Phenanthrene	mg/kg	162043-2	12 || 9.2 || RPD: 26
Anthracene	mg/kg	162043-2	3.4 || 2.5 || RPD: 31
Fluoranthene	mg/kg	162043-2	15 || 11 || RPD: 31
Pyrene	mg/kg	162043-2	13 || 9.8 || RPD: 28
Benzo(a)anthracene	mg/kg	162043-2	6.2 || 5.4 || RPD: 14
Chrysene	mg/kg	162043-2	5.1 || 3.8 || RPD: 29
Benzo(b,j+k)fluoranthene	mg/kg	162043-2	7.5 || 6.2 || RPD: 19
Benzo(a)pyrene	mg/kg	162043-2	4.4 || 3.7 || RPD: 17
Indeno(1,2,3-c,d)pyrene	mg/kg	162043-2	2.0 || 2.1 || RPD: 5
Dibenzo(a,h)anthracene	mg/kg	162043-2	0.6 || 0.9 || RPD: 40
Benzo(g,h,i)perylene	mg/kg	162043-2	2.1 || 1.8 || RPD: 15
Surrogate p-Terphenyl-d14	%	162043-2	79 || 95 || RPD: 18

QUALITY CONTROL CEC	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date prepared	-	162043-14	20/02/2017 || 20/02/2017
Date analysed	-	162043-14	20/02/2017 || 20/02/2017
Exchangeable Ca	meq/100 g	162043-14	6.5 || 6.5 || RPD: 0
Exchangeable K	meq/100 g	162043-14	0.2 || 0.2 || RPD: 0
Exchangeable Mg	meq/100 g	162043-14	7.1 || 7.1 || RPD: 0
Exchangeable Na	meq/100 g	162043-14	0.13 || 0.14 || RPD: 7

Report Comments:

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

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 162043-4 for Cd. Therefore a triplicate result has been issued as laboratory sample number 162043-24.

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

INS: Insufficient sample for this test
NR: Test not required
<: Less than
PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than
NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Combo1=TRH/BTEX/Pb
Combo2=TRH/BTEX/PAH/Pb
Combo3=TRH/BTEX/PAH/Met
Combo4=TRH/BTEX/PAH/Met/Phen
Combo5=TRH/BTEX/PAH/OC/PCB/Met
Combo6=TRH/BTEX/PAH/OC/OP/PCB/Met
Combo7=TRH/BTEX/PAH/OC/PCB/Met/Phen
Combo8=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen
Combo9=TRH/BTEX/PAH/OC/PCB/Met/Phen/CN
Combo10=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen/CN
Combo11=TRH/BTEX/PAH/OC/PCB/2met/Phen/CN
Combo12=TRH/BTEX/PAH/OC/PCB/Met/TCLP-PAH ,6 Met
Combo13=TRH/BTEX/PAH/OC/OP/PCB/Met/TCLP-PAH ,6Met

A Combo with an `A' indicates Asbestos is also needed.

Client: DLA
Contact Person: Matthew Jungkarrow
Project Mgr: Richard Colton
Sampler: Matthew Jungkarrow
Address: Unit 3/38 Leighton Place, Hornsby
Phone: **Mob:**
Email: Sydney@dlaenvironmental.com.au

Client Project Name / Number / Site etc (ie report title): DL 39159 – Hurstville
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Report format: esdat / equis /
Lab Comments:

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 6A	Combo 3	VOC	PH/EC/Cec	Comments
1	BH7-0.5	0.5	15.2.17	Soil	X				
2	117-0.5A	0.5	↓	↓	X				
3	117-1.5	1.5				X		X	
4	118-0.4	0.4			X		X		
5	118-2.0	2.0			X		X		
6	119-0.4	0.4			X		X		
7	119-0.8	0.8			X		X		
8	119-1.5	1.5			X		X		
9	1110-0.5	0.5			X		X		
10	1110-1.0	1.0				X			
11	1111-0.4	0.4			X		X		
12	1111-0.8	0.8				X			
13	1112-0.4	0.4			X				
14	1112-0.8	0.8				X		X	
15	1113-0.5	0.5			X				

Provide as much information about the sample as you can

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 162043
Date Received: 16/2
Time Received: 16:30
Received by: JM
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (Company): DLA
Print Name: Matthew Jungkarrow
Date & Time: 16-2-17
Signature:

Received by (Company): ELS
Print Name: James
Date & Time: 16/2 16:30
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Combo1=TRH/BTEX/Pb
Combo2=TRH/BTEX/PAH/Pb
Combo3=TRH/BTEX/PAH/Met
Combo4=TRH/BTEX/PAH/Met/Phen
Combo5=TRH/BTEX/PAH/OC/PCB/Met
Combo6=TRH/BTEX/PAH/OC/OP/PCB/Met
Combo7=TRH/BTEX/PAH/OC/PCB/Met/Phen
Combo8=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen
Combo9=TRH/BTEX/PAH/OC/PCB/Met/Phen/CN
Combo10=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen/CN
Combo11=TRH/BTEX/PAH/OC/PCB/12met/Phen/CN
Combo12=TRH/BTEX/PAH/OC/PCB/Met/TCLP-PAH ,6 Met
Combo13=TRH/BTEX/PAH/OC/OP/PCB/Met/TCLP-PAH ,6Met

A Combo with an `A' indicates Asbestos is also needed.

Client: DLA	**Client Project Name / Number / Site etc (ie report title):** DL 3959 – Harsti'lle
Contact Person: Matthew Junghans	**PO No.:**
Project Mgr: Richard Botton	**Envirolab Quote No. :**
Sampler: Matthew Junghans	**Date results required:**
Address: Unit 3/38 Leighton Place, Hornsby	**Or choose:** standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: **Mob:**	**Report format:** esdat / equis /
Email: Sydney@dlaenvironmental.com.au	**Lab Comments:**

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 6A	Combo 3	VOC	PHE/FLUE												Provide as much information about the sample as you can
162043																				
16	BH13 – 0.7	0.7	16-2-17	Soil		X	X													
17	" 14 – 0.3	0.3	↓	↓	X															
18	" 15 – 0.5	0.5			X															
19	" 16 – 0.4	0.4			X															
20	MW4 – 0.5	0.5			X															
21	" – 2.0	2.0				X														
22	" – 2.0A	2.0				X														
23	" – 2.4	2.4				X		X												

Relinquished by (Company):	DLA	**Received by (Company):**	ELS
Print Name:	Matthew Junghans	**Print Name:**	James
Date & Time:	16-2-17	**Date & Time:**	16.2 16:30
Signature:		**Signature:**	

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 162418

Client:

DLA Environmental Services Pty Ltd
Unit 3, 38 Leighton Pl
Hornsby
NSW 2077

Attention: Richard Bolton

Sample log in details:

Your Reference:	**DL3959, Hurstville**		
No. of samples:	4 waters		
Date samples received / completed instructions received	23/02/17	/	23/02/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	28/02/17	/	28/02/17
Date of Preliminary Report:	Not Issued		

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

Results Approved By:

David Springer
General Manager

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	162418-1 MW1 23/02/2017 Water	162418-2 MW1_A 23/02/2017 Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017
Dichlorodifluoromethane	µg/L	<10	<10
Chloromethane	µg/L	<10	<10
Vinyl Chloride	µg/L	<10	<10
Bromomethane	µg/L	<10	<10
Chloroethane	µg/L	<10	<10
Trichlorofluoromethane	µg/L	<10	<10
1,1-Dichloroethene	µg/L	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1
1,1-dichloroethane	µg/L	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1
Bromochloromethane	µg/L	<1	<1
Chloroform	µg/L	<1	<1
2,2-dichloropropane	µg/L	<1	<1
1,2-dichloroethane	µg/L	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1
1,1-dichloropropene	µg/L	<1	<1
Cyclohexane	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Benzene	µg/L	<1	<1
Dibromomethane	µg/L	<1	<1
1,2-dichloropropane	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Bromodichloromethane	µg/L	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1
Toluene	µg/L	1	2
1,3-dichloropropane	µg/L	<1	<1
Dibromochloromethane	µg/L	<1	<1
1,2-dibromoethane	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1
Chlorobenzene	µg/L	<1	<1
Ethylbenzene	µg/L	2	2
Bromoform	µg/L	<1	<1
m+p-xylene	µg/L	7	8
Styrene	µg/L	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1
o-xylene	µg/L	4	5

VOCs in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	162418-1 MW1 23/02/2017 Water	162418-2 MW1_A 23/02/2017 Water
1,2,3-trichloropropane	µg/L	<1	<1
Isopropylbenzene	µg/L	<1	<1
Bromobenzene	µg/L	<1	<1
n-propyl benzene	µg/L	<1	1
2-chlorotoluene	µg/L	<1	<1
4-chlorotoluene	µg/L	<1	<1
1,3,5-trimethyl benzene	µg/L	2	3
Tert-butyl benzene	µg/L	<1	<1
1,2,4-trimethyl benzene	µg/L	9	11
1,3-dichlorobenzene	µg/L	<1	<1
Sec-butyl benzene	µg/L	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1
4-isopropyl toluene	µg/L	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1
n-butyl benzene	µg/L	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1
Hexachlorobutadiene	µg/L	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	110	110
Surrogate toluene-d8	%	96	96
Surrogate 4-BFB	%	103	103

vTRH(C6-C10)/BTEXN in Water					
Our Reference:	UNITS	162418-1	162418-2	162418-3	162418-4
Your Reference	---------- -	MW1	MW1_A	TS	TB
Date Sampled	----------	23/02/2017	23/02/2017	23/02/2017	23/02/2017
Type of sample		Water	Water	Water	Water
Date extracted	-	24/02/2017	24/02/2017	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017	27/02/2017	27/02/2017
TRHC$_6$ - C$_9$	µg/L	20	22	[NA]	[NA]
TRHC$_6$ - C$_{10}$	µg/L	57	66	[NA]	[NA]
TRHC$_6$ - C$_{10}$ less BTEX (F1)	µg/L	43	49	[NA]	[NA]
Benzene	µg/L	<1	<1	72%	<1
Toluene	µg/L	1	2	86%	<1
Ethylbenzene	µg/L	2	2	94%	<1
m+p-xylene	µg/L	7	8	96%	<2
o-xylene	µg/L	4	5	100%	<1
Naphthalene	µg/L	<1	<1	[NA]	[NA]
Surrogate Dibromofluoromethane	%	110	110	103	105
Surrogate toluene-d8	%	96	96	99	98
Surrogate 4-BFB	%	103	103	109	101

svTRH (C10-C40) in Water			
Our Reference:	UNITS	162418-1	162418-2
Your Reference	----------	MW1	MW1_A
	-		
Date Sampled	----------	23/02/2017	23/02/2017
Type of sample		Water	Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017
$TRHC_{10}$ - C_{14}	µg/L	<50	<50
$TRHC_{15}$ - C_{28}	µg/L	<100	<100
$TRHC_{29}$ - C_{36}	µg/L	<100	<100
$TRH{>}C_{10}$ - C_{16}	µg/L	<50	<50
$TRH{>}C_{10}$ - C_{16} less Naphthalene (F2)	µg/L	<50	<50
$TRH{>}C_{16}$ - C_{34}	µg/L	<100	<100
$TRH{>}C_{34}$ - C_{40}	µg/L	<100	<100
Surrogate o-Terphenyl	%	76	81

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	 162418-1 MW1 23/02/2017 Water	 162418-2 MW1_A 23/02/2017 Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	27/02/2017	27/02/2017
Naphthalene	µg/L	<1	<1
Acenaphthylene	µg/L	<1	<1
Acenaphthene	µg/L	<1	<1
Fluorene	µg/L	<1	<1
Phenanthrene	µg/L	<1	<1
Anthracene	µg/L	<1	<1
Fluoranthene	µg/L	<1	<1
Pyrene	µg/L	<1	<1
Benzo(a)anthracene	µg/L	<1	<1
Chrysene	µg/L	<1	<1
Benzo(b,j+k)fluoranthene	µg/L	<2	<2
Benzo(a)pyrene	µg/L	<1	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1	<1
Dibenzo(a,h)anthracene	µg/L	<1	<1
Benzo(g,h,i)perylene	µg/L	<1	<1
Benzo(a)pyrene TEQ	µg/L	<5	<5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	80	88

OCP in water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	162418-1 MW1 23/02/2017 Water	162418-2 MW1_A 23/02/2017 Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017
HCB	µg/L	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2
Surrogate TCMX	%	112	114

OP Pesticides in water			
Our Reference:	UNITS	162418-1	162418-2
Your Reference	----------	MW1	MW1_A
	-		
Date Sampled	----------	23/02/2017	23/02/2017
Type of sample		Water	Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2
Dichlorovos	µg/L	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2
Surrogate TCMX	%	112	114

PCBs in Water			
Our Reference:	UNITS	162418-1	162418-2
Your Reference	----------	MW1	MW1_A
	-		
Date Sampled	----------	23/02/2017	23/02/2017
Type of sample		Water	Water
Date extracted	-	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017
Aroclor 1016	µg/L	<2	<2
Aroclor 1221	µg/L	<2	<2
Aroclor 1232	µg/L	<2	<2
Aroclor 1242	µg/L	<2	<2
Aroclor 1248	µg/L	<2	<2
Aroclor 1254	µg/L	<2	<2
Aroclor 1260	µg/L	<2	<2
Surrogate TCLMX	%	112	114

HM in water - dissolved			
Our Reference:	UNITS	162418-1	162418-2
Your Reference	----------	MW1	MW1_A
	-		
Date Sampled	----------	23/02/2017	23/02/2017
Type of sample		Water	Water
Date prepared	-	24/02/2017	24/02/2017
Date analysed	-	24/02/2017	24/02/2017
Arsenic-Dissolved	µg/L	1	1
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	3	3
Lead-Dissolved	µg/L	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05
Nickel-Dissolved	µg/L	3	3
Zinc-Dissolved	µg/L	43	46

Method ID	Methodology Summary
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-022	Determination of various metals by ICP-MS.
Metals-021	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	162418-1	24/02/2017 || 24/02/2017	LCS-W1	24/02/2017
Date analysed	-			27/02/2017	162418-1	27/02/2017 || 27/02/2017	LCS-W1	27/02/2017
Dichlorodifluoromethane	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
Chloromethane	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
Vinyl Chloride	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
Bromomethane	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
Chloroethane	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
Trichlorofluoromethane	µg/L	10	Org-013	<10	162418-1	<10 || <10	[NR]	[NR]
1,1-Dichloroethene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,1-dichloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	94%
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Bromochloromethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Chloroform	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	97%
2,2-dichloropropane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2-dichloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	97%
1,1,1-trichloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	97%
1,1-dichloropropene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Cyclohexane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Carbon tetrachloride	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Benzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Dibromomethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2-dichloropropane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Trichloroethene	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	92%
Bromodichloromethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	95%
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Toluene	µg/L	1	Org-013	<1	162418-1	1 || 1 || RPD: 0	[NR]	[NR]
1,3-dichloropropane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Dibromochloromethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	94%
1,2-dibromoethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Tetrachloroethene	µg/L	1	Org-013	<1	162418-1	<1 || <1	LCS-W1	101%
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Chlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Ethylbenzene	µg/L	1	Org-013	<1	162418-1	2 || 1 || RPD: 67	[NR]	[NR]
Bromoform	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
m+p-xylene	µg/L	2	Org-013	<2	162418-1	7 || 7 || RPD: 0	[NR]	[NR]
Styrene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
o-xylene	µg/L	1	Org-013	<1	162418-1	4 || 4 || RPD: 0	[NR]	[NR]

QUALITY CONTROL VOCs in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
1,2,3-trichloropropane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Isopropylbenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Bromobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
n-propyl benzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
2-chlorotoluene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
4-chlorotoluene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	162418-1	2 || 2 || RPD: 0	[NR]	[NR]
Tert-butyl benzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	162418-1	9 || 8 || RPD: 12	[NR]	[NR]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Sec-butyl benzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
4-isopropyl toluene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
n-butyl benzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Hexachlorobutadiene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-013	109	162418-1	110 || 109 || RPD: 1	LCS-W1	105%
Surrogate toluene-d8	%		Org-013	98	162418-1	96 || 96 || RPD: 0	LCS-W1	97%
Surrogate 4-BFB	%		Org-013	103	162418-1	103 || 103 || RPD: 0	LCS-W1	106%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	162418-1	24/02/2017 || 24/02/2017	LCS-W1	24/02/2017
Date analysed	-			27/02/2017	162418-1	27/02/2017 || 27/02/2017	LCS-W1	27/02/2017
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	162418-1	20 || 22 || RPD: 10	LCS-W1	98%
TRHC$_6$ - C$_{10}$	µg/L	10	Org-016	<10	162418-1	57 || 55 || RPD: 4	LCS-W1	98%
Benzene	µg/L	1	Org-016	<1	162418-1	<1 || <1	LCS-W1	97%
Toluene	µg/L	1	Org-016	<1	162418-1	1 || 1 || RPD: 0	LCS-W1	98%
Ethylbenzene	µg/L	1	Org-016	<1	162418-1	2 || 1 || RPD: 67	LCS-W1	96%
m+p-xylene	µg/L	2	Org-016	<2	162418-1	7 || 7 || RPD: 0	LCS-W1	99%
o-xylene	µg/L	1	Org-016	<1	162418-1	4 || 4 || RPD: 0	LCS-W1	100%
Naphthalene	µg/L	1	Org-013	<1	162418-1	<1 || <1	[NR]	[NR]
Surrogate Dibromofluoromethane	%		Org-016	104	162418-1	110 || 109 || RPD: 1	LCS-W1	102%
Surrogate toluene-d8	%		Org-016	97	162418-1	96 || 96 || RPD: 0	LCS-W1	102%
Surrogate 4-BFB	%		Org-016	87	162418-1	103 || 103 || RPD: 0	LCS-W1	108%

QUALITY CONTROL svTRH (C10-C40) in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	118%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	110%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	115%
TRH>C$_{10}$ - C$_{16}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	118%
TRH>C$_{16}$ - C$_{34}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	110%
TRH>C$_{34}$ - C$_{40}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	115%
Surrogate o-Terphenyl	%		Org-003	77	[NT]	[NT]	LCS-W1	102%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W2	24/02/2017
Date analysed	-			27/02/2017	[NT]	[NT]	LCS-W2	27/02/2017
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	100%
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	116%
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	122%
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	114%
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	116%
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	104%
Benzo(b,j +k)fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	LCS-W2	98%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	70	[NT]	[NT]	LCS-W2	108%
QUALITY CONTROL OCP in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	83%
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	94%
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	89%
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	85%
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	90%
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	87%
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	96%
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	113%
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	129%
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	LCS-W1	103%
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	98	[NT]	[NT]	LCS-W1	124%

QUALITY CONTROL OP Pesticides in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	71%
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Diazinon	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Dichlorovos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	73%
Dimethoate	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NR]	[NR]
Ethion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	112%
Fenitrothion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	84%
Malathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	77%
Parathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	81%
Ronnel	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	LCS-W1	73%
Surrogate TCMX	%		Org-008	98	[NT]	[NT]	LCS-W1	110%

QUALITY CONTROL PCBs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Aroclor 1016	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	µg/L	2	Org-006	<2	[NT]	[NT]	LCS-W1	79%
Aroclor 1260	µg/L	2	Org-006	<2	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	98	[NT]	[NT]	LCS-W1	110%

Client Reference: DL3959, Hurstville

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Date analysed	-			24/02/2017	[NT]	[NT]	LCS-W1	24/02/2017
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	106%
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	LCS-W1	102%
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	105%
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	105%
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	104%
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	LCS-W1	101%
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	104%
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	LCS-W1	104%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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

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

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Combo1=TRH/BTEX/Pb
Combo2=TRH/BTEX/PAH/Pb
Combo3=TRH/BTEX/PAH/Met
Combo4=TRH/BTEX/PAH/Met/Phen
Combo5=TRH/BTEX/PAH/OC/PCB/Met
Combo6=TRH/BTEX/PAH/OC/OP/PCB/Met
Combo7=TRH/BTEX/PAH/OC/PCB/Met/Phen
Combo8=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen
Combo9=TRH/BTEX/PAH/OC/PCB/Met/Phen/CN
Combo10=TRH/BTEX/PAH/OC/OP/PCB/Met/Phen/CN
Combo11=TRH/BTEX/PAH/OC/PCB/12met/Phen/CN
Combo12=TRH/BTEX/PAH/OC/PCB/Met/TCLP-PAH ,6 Met
Combo13=TRH/BTEX/PAH/OC/OP/PCB/Met/TCLP-PAH ,6Met

A Combo with an `A' indicates Asbestos is also needed.

Client: DLA
Contact Person: Richard Bolton
Project Mgr:
Sampler:
Address: Unit 3/38 Leighton Place, Hornsby
Phone: **Mob:**
Email:

Client Project Name / Number / Site etc (ie report title): Merrylville DC3959
PO No.:
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / (3 day)
Note: Inform lab in advance if urgent turnaround is required surcharges apply
Report format: esdat / equis /
Lab Comments:

Sample information					Tests Required				Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 6	VOC	BTEX		Provide as much information about the sample as you can
1	MW1		23.2.17	water	X	X			
2	MW1-A		23.2.17	"	X	X			
3,4	TS/TB					X	X		

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

Job No: 162418
Date Received: 23/2
Time Received: 13:30
Received by: JAC
Temp: (Cool)/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (Company): DLA
Print Name: Loretta
Date & Time: 23.2.17
Signature:

Received by (Company): ES
Print Name: James
Date & Time: 23/2 13:30
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

White - Lab copy / Blue - Client copy / Pink - Retain in Book

APPENDIX E – QUALITY CONTROL / QUALITY ASSURANCE

APPENDIX E1 – FIELD QUALITY CONTROL

During the assessment of contaminated sites, the integrity of data collected is considered paramount. With the assessment of the Site, a number of measures were taken to ensure the quality of the data. These included:

Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared and supplied glass jars with Teflon lid inserts for soil, and laboratory prepared and supplied plastic and glass bottles for groundwater. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

Decontamination

All equipment used in the sampling program was decontaminated prior to use and between samples to minimise the potential for prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90; and
- Rinsing in clean demineralised water then wiping with clean lint free cloths.

Sample Tracking, Identification and Holding Times

Soil and groundwater samples were forwarded to Envirolab Services Pty Ltd, a NATA registered laboratory located in Chatswood, under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. Samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

Sample Transport

Soil and groundwater samples were packed into a chilled cooler from the time of collection. These were transported under chain of custody from the site to Envirolab. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes. Samples were kept below 4°C at all times.

Trip Spike and Trip Blank

Trip spikes are used to assess whether volatile contaminants in samples may have been lost during transport. Trip blanks are used to assess whether volatile contamination may have been introduced to a sample during shipping and handling.

Although trip spikes and blanks were not collected during the soil investigation program, the results of the laboratory analysis suggest that there is a low likelihood for the loss or transfer of volatile contaminants from the samples collected from the Site. This is based on the fact that widespread volatile hydrocarbon contamination was not identified within the soil underlying the Site as evidenced by the absence of detectable TRH, BTEX and VOC concentrations reported in all areas of the Site except in the vicinity of boreholes BH8 and BH9.

The absence of trip spike and trip blank sample data during the soil investigation program is not considered to affect the precision or accuracy of the laboratory data, or the conclusions of the overall assessment.

One trip spike and one trip blank were collected as part of the groundwater investigation program. The results are presented below.

SAMPLE ID	TS	TB
Benzene	72%	<1
Toluene	86%	<1
Ethylbenzene	94%	<1
m+p-xylene	96%	<2
o-xylene	100%	<1

These results are considered acceptable for the purpose of this investigation.

Field Duplicate Samples

Field duplicate samples for soil were prepared through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication;
- The sample is placed in a decontaminated stainless bowl and mixed as thoroughly as practicable before being divided into equal parts;
- Two portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample; and,

- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Duplicate samples were prepared on the basis of sample numbers recovered during the field work. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment. The duplicate sample frequencies are shown below:

SOIL SAMPLES	**21 primary samples**	2 intra-laboratory duplicates	10%
GROUNDWATER SAMPLES	**1 primary sample**	1 intra-laboratory duplicate	100%

An intra-laboratory duplicate rate of approximately 10% was achieved for soil samples, which is equivalent to that required by the Field Quality Plan. No inter-laboratory duplicate soil samples were collected.

An intra-laboratory duplicate rate of approximately 100% was achieved for groundwater samples. No inter-laboratory duplicate groundwater samples were collected.

Comparisons were made of the laboratory test results for the duplicate samples with the original samples and the Relative Percentage Difference (RPD) calculated as difference / average in order to assess the accuracy of the sampling and laboratory test procedures. The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- Less than 30% for inorganics and 50% for organics;
- Less than five times the Laboratory LOR; and
- The difference between concentrations is less than 5% of the relevant SAC.

Tables 3 and **4** in **Appendix C** give details of intra-laboratory chemical duplicates.

Field duplicates provide an indication of the whole validation process, including the sampling process, sample preparation and analysis.

Soil

Two RPD exceedances were reported for organics (benzo(a)pyrene and Total PAH), while five exceedances were reported for inorganics (heavy metals). The differences in concentrations of the

following intra-laboratory duplicate pairs were for reported concentrations of less than five times the LOR:

- BH7_0.5 / BH7A_0.5 for cadmium, nickel and benzo(a)pyrene
- MW4_2.0 / MW4A_2.0 for arsenic

Intra-laboratory duplicate pair BH7_0.5 / BH7A_0.5 reported RPDs above the acceptable range and contaminant concentrations less than, or equivalent to, 5% of the relevant HIL in at least one of the samples for cadmium, chromium, nickel, zinc and Total PAH.

The reported outliers are expected to be due to the heterogeneous nature of the fill material comprising the samples, rather than poor field techniques. Overall, the field and laboratory data obtained is considered acceptable for the purposes of this assessment.

Although no inter-laboratory duplicate samples were collected, the RPD calculations suggest that results outside the acceptable range would likely be reported for heavy metals due to the heterogeneity of the sample matrix.

Groundwater

RPD calculations for field duplicate groundwater samples reported results within the acceptable range with the exception of toluene with a RPD of 67%. The primary and duplicate concentrations were reported to be close to the laboratory LOR which exaggerates the results of the RPD calculation. This result is considered acceptable.

APPENDIX E2 – LABORATORY ANALYTICAL AND QUALITY PLAN

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by DLA are based upon techniques published by the USEPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM (NEPC, 2013). Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Blanks

Blanks were used for the identification of false positive data. Laboratory blank samples were analysed. No cross contamination of samples is said to have occurred as a result of laboratory techniques provided all blanks show concentrations below the levels of detection.

Contaminant concentrations were reported to be less than the laboratory LOR for each blank sample.

Spikes and Control Samples

Control sample spikes were utilised for determination of matrix recovery analysis. This involves analysis of spiked control samples and their duplicates, spiked with a known concentration of relative analyte. Accuracy was assessed by calculation of the percent recovery (%R). The duplicate sample spikes were used to assess the precision of the methods used.

All matrix spike recovery and blank determinations were reported to be within acceptable limits.

Duplicates

Laboratory duplicates are tested to ensure the results meet the requirements of QA/QC.

RPD calculations for laboratory duplicate samples reported results within the acceptable range with the exception of the following:

<u>Soil (laboratory report 162043)</u>

- Cadmium with a RPD of 99%
- Mercury with a RPD of 40%
- Nickel with a RPD of 33%
- Zinc with a RPD of 32%
- PAH-based compounds with RPDs between 31% and 67%

These outliers are expected to be due to the heterogeneous nature of the fill material comprising the samples, rather than poor laboratory techniques.

Groundwater (laboratory report 162418)

- Ethylbenzene with a RPD of 67%

The primary and duplicate concentrations were reported to be close to the laboratory LOR which exaggerates the results of the RPD calculation. This result is considered acceptable.

Surrogates

To assess the performance of individual organic analysis the laboratory used surrogates. Recoveries were calculated for each surrogate providing an indication of analytical accuracy.

Surrogate recoveries for soil samples were reported to be within the recommended control limits, indicating that there was an acceptable degree of accuracy in analysing for organic compounds.

Laboratory Detection Limits

Laboratory detection limits for soil and water analyses by Envirolab are outlined in **Table E1** and **Table E2**.

Table E1 – Method of Soil Analysis: Envirolab

ANALYTE	METHOD	LIMIT OF REPORTING mg/kg	
PAH	Org-012	Individual analytes	0.1
Metals	Metals-020 Metals-021	As	4
		Cd	0.4
		Cr, Cu, Pb, Ni, Zn	1
		Hg	0.1
Pesticides	Org-005	OCP	0.1
	Org-008	OPP	0.1
PCB	Org-006	Individual analytes	0.1
BTEX	Org-016	Benzene	1
		Toluene	1
		Ethylbenzene	1
		Total Xylene	3
TRH	Org-016 Org-003	C6-C10 (F1)	25
		>C10-C16 (F2)	50

ANALYTE	METHOD	LIMIT OF REPORTING mg/kg	
		>C16-C34 (F3)	100
		>C36-C40 (F4)	100
VOC	Org-014	Individual analytes	1

Table E2 – Method of Groundwater Analysis: Envirolab

ANALYTE	METHOD	LIMIT OF REPORTING ug/L	
PAH	Org-012	Individual analytes	1
Metals	Metals-021 ICP-MS Metals-022 ICP-MS	As, Cr, Cu, Pb, Ni, Zn	1
		Cd	0.1
		Hg	0.05
Pesticides	Org-005	OCP	0.1
	Org-008	OPP	0.1
PCB	Org-006	Individual analytes	0.1
BTEX	Org-016	Benzene	1
		Toluene	1
		Ethylbenzene	1
		Total Xylene	3
TRH	Org-016 Org-003	C6-C10 (F1)	10
		>C10-C16 (F2)	50
		>C16-C34 (F3)	100
		>C36-C40 (F4)	100
VOC	Org-013	Individual analytes	1 - 10