



Supplementary Site Investigation

Ivanhoe Estate
Corner Herring Road and Epping Road
Macquarie Road NSW 2113

Frasers Property Australia

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ABBREVIATIONS

A list of the common abbreviations used throughout environmental reports is provided below:

ABC	Ambient Background Concentration
ACL	Added Contaminant Limit
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
CEC	Cation Exchange Capacity
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation of the Environment
DLA	DLA Environmental Services
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EIL	Ecological Investigation Level
EPA	Environment Protection Authority (NSW)
ESL	Ecological Screening Level
HIL	Health-Based Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
ML	Management Limit
NA	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NL	Not Limiting
NSW	New South Wales
OC/OP	Organochlorine / Organophosphorus Pesticides
OEH	Office of Environmental and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percentage Difference
SEPP	State Environmental Planning Policy
TEQ	Toxicity Equivalence Quotient
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit

EXECUTIVE SUMMARY

DLA Environmental Services was engaged by Frasers Property Australia to undertake a Supplementary Investigation of the area identified as 'Ivanhoe Estate', located on the corner of Herring Road and Epping Road, Macquarie Park NSW 2113 ('the Site').

A Detailed Site Investigation was previously carried out to assess the contamination status of the Site (JBS&G, 2016), however data gaps were identified in some areas of the Site. Consequently, this Supplementary Investigation report provides environmental characterisation of soil across the remaining areas of the Site that were identified as data gaps and assesses the suitability of these areas for proposed future residential land use.

The investigation included the collection of soil samples collected from nine targeted boreholes. The samples were submitted for laboratory analysis for a suite of typical contaminants of potential concern. soil samples collected from borehole BH8 reported petroleum hydrocarbons at concentrations exceeding the health and ecological screening levels. All other soil samples reported contaminant concentrations below the adopted investigation and screening levels. In addition, asbestos was not detected in any of the samples submitted for analysis.

Based on the results of the current investigation data, DLA concludes that the area of the Site in the vicinity of borehole BH8 is not currently considered suitable for the proposed redevelopment from a contamination perspective due to the presence of hydrocarbons in soil.

Although the Site is not considered suitable for the proposed land use in its current condition, DLA considers that the Site can be made suitable with further assessment and the implementation of an appropriate remediation strategy.

Further investigation and remediation of the Site would include:

1. Delineation soil sampling and laboratory analysis;
2. Preparation of a Remediation Action Plan for the Site;
3. Remediation of the Site which would include the excavation and appropriate off-site disposal of TRH contaminated soils;
4. Validation sampling of the Site; and
5. Preparation of a Site Validation Report.

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1.0 INTRODUCTION

1.1 General

DLA Environmental Services (DLA) was engaged by Frasers Property Australia (the Client) to undertake a Supplementary Investigation of the following area:

'Ivanhoe Estate'
Corner Herring Road and Epping Road, Macquarie Park NSW 2113 ('the Site')

A Detailed Site Investigation (DSI) was previously carried out to assess the contamination status of the Site (JBS&G, 2016), however data gaps were identified in areas of the Site previously subject to earthworks (cut and fill activities). The results of the investigation were presented in the following report:

- *Detailed Site Investigation – Ivanhoe Estate, Herring Road, Macquarie Park NSW* (JBS&G, dated 30 September 2016, reference: 52047/104956 (Rev A)).

This Supplementary Investigation report provides environmental characterisation of soil via intrusive investigation across the remaining areas of the Site that were identified as data gaps within the DSI. In addition, this report considers the suitability of these areas of the Site for proposed future residential land use.

This report has been prepared utilising information from current investigation works, previous investigation reports, and from experience, knowledge, and current industry practice in the investigation of similar sites.

This Supplementary Investigation report should be read in conjunction with the DSI report (JBS&G, 2016).

1.2 Objectives

The objectives of this Supplementary Investigation are to supplement the results presented in the DSI report (JBS&G, 2016) and satisfy the general requirements of State Environmental Planning Policy No.55 (SEPP 55) in accordance with *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011).

Specifically, this Supplementary Investigation will consider the potential for suspected historical activities to have caused contamination in areas of the Site not previously assessed, and provide conclusions regarding the suitability of the Site for future use consistent with 'Residential A' as described by the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1) ('NEPM', NEPC, 2013).

1.3 Scope of Works

To achieve these objectives, DLA carried out the following works:

- Targeted intrusive investigations comprising the collection of soil samples from nine boreholes;
- Data assessment and reporting, including comparison with relevant New South Wales (NSW) Environment Protection Authority (EPA) made or endorsed investigation and screening levels;
- Assessment of whether the area of the Site subject to the current investigation is suitable for the proposed land use from a contamination perspective;
- Consideration of potential Site contamination management requirements, if any; and
- Preparation of this Supplementary Investigation report.

2.0 SITE DESCRIPTION

2.1 Site Identification

Based on the Site inspection carried out by DLA on the XXX 2017, and a review of published records, the Site identification details are summarised in Table 1.

Table 1: Site Identification Summary

ITEMS	DETAILS
Site Name	'Ivanhoe Estate'
Address	Corner Herring Road and Epping Road, Macquarie Park, NSW 2113
Lot and Deposited Plan	Lots 6 to 17 and 18 to 20 in Deposited Plan 861433 Lot 1 in DP 859537 Lot 100 in Deposited Plan 1223787 Part Lot 5 in Deposited Plan 740753
Local Government Authority	City of Ryde
Site Zoning	B4 – Mixed Use under the Ryde Local Environmental Plan 2014
Current Use	Residential (Department of Housing)
Total Site Area (approx.)	8.2 hectares
Locality Map	Refer to Figure 1 – Site Location
Site Survey	Refer to Figure 2 – Site Layout and Supplementary Sample Locations

2.2 Proposed Development

The proposed development scenario is expected to include a combination of low and high-density residential land use. For the purposes of this investigation, the most conservative land use scenario has been adopted, which is consistent with the definition of 'Residential with gardens and accessible soil' provided in Schedule B7 of the NEPM (NEPC, 2013).

2.3 Boundaries and Surrounding Land Use

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

Table 2: Boundaries and Surrounding Land Use

DIRECTION	DETAILS
North-west	Herring Road with high-density residential premises and Macquarie University beyond
North-east	Medium to high-density residential premises
South-west	Epping Road with low-density residential premises beyond
South-east	Commercial (offices) premises

2.4 Environmental Setting

The landscape and environmental setting of the Site is summarised in Table 3.

Table 3: Environmental Setting

DIRECTION	DETAILS
Topography	The Site lies at gradients between approximately 47m Australian Height Datum (AHD) in the southern-most corner and 75m AHD along the north-western boundary. The Site exhibits an overall gradient from the north-western boundary down towards the south / south-east.
Geology	The 1:100,000 Sydney Geological Series Sheet (9130) indicates that the Site lies on the boundary of Triassic-aged Ashfield Shale of the Wianamatta Group and Hawkesbury Sandstone. Ashfield Shale comprises black and dark grey shale and laminite derived from lacustrine environments. Hawkesbury Sandstone comprises medium to coarse grained quartz sandstone with very minor shale and laminite lenses derived from braided alluvial channel fill.
Acid Sulfate Soils	The 1:25,000 Prospect / Parramatta River Acid Sulfate Soil Risk Map indicates that there are no known occurrences of acid sulfate soil in the vicinity of the Site.
Hydrology	Shrimpton Creek runs along the south-eastern boundary of the Site. Shrimpton Creek flows in a broadly northerly direction, ultimately discharging to the Lane Cove River which is located approximately 1.35 km to the north-east of the Site. The surface of the Site comprises both sealed and unsealed surfaces. In areas of the Site where unsealed surfaces are present (i.e. lawns and garden beds), it is expected that surface water (rainfall) would infiltrate into the subsurface. In areas of the Site where impervious pavements are present (i.e. roadways), or where the subsurface becomes waterlogged following periods of prolonged or heavy rainfall, runoff water would form overland flow and follow the gradient of the land.
Hydrogeology	Review of the NSE Office of Water groundwater data indicates that there are no registered bores within a 500m radius of the Site. The closest registered bore to the Site is located approximately 650m to the north / north-east and is registered for use for monitoring purposes. No details regarding the depth to groundwater are available for the nearby registered bores, however it is expected that regional groundwater would be present at depth within the underlying bedrock. Based on the hydrology of the local area, it is expected that groundwater underlying the Site would flow in a north-easterly direction towards the Lane Cove River.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

3.1 Detailed Site Investigation

Detailed Site Investigation – Ivanhoe Estate, Herring Road, Macquarie Park NSW (JBS&G, dated 30 September 2016, reference: 52047/104956 (Rev A)).

The DSI comprised a review of previous investigations, historical information and intrusive sampling which included 26 grid-based and targeted borehole locations.

The results of the soil sampling and laboratory analysis reported contaminants of potential concern at concentrations less than the investigation criteria, with the exception of benzo(a)pyrene which exceeded the adopted ecological criteria at one sample location. This ecological exceedance was not considered to present an unacceptable ecological risk due to its limited effects on plant uptake.

The report concluded that the soils underlying the Site do not present an unacceptable risk to human health or the environment and do not preclude redevelopment of the Site for its intended land use.

3.2 Summary of In-Ground Contamination

Summary of In-Ground Contamination – Ivanhoe Estate, Cnr Herring and Epping Roads, Macquarie Park NSW 2113 (DLA, dated 11 October 2016, reference: DL3951_S005491).

The document was prepared in response to a review of the DSI report (JBS&G, 2016) which indicated that historical cut and fill activities were undertaken on-site to facilitate the construction of larger developments in the estate.

Based on a review of the available historical and investigation data, DLA concluded that there was a low likelihood of unacceptable contamination to be present on the Site as a result of past and present land use activities, however data gaps existed for the cut and fill areas.

DLA recommended that additional visual inspections and limited sampling be performed across the cut and fill areas with the aim of addressing the identified data gaps with regards to the presence of subsurface contamination associated with fill material.

4.0 SAMPLING, ANALYSIS AND QUALITY PLAN

4.1 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 potentially 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 4.

Table 4: Summary of DQOs

1	State the Problem	This Supplementary Investigations aims to address the question of whether previous land uses have affected the suitability of the Site for future land use consistent with 'Residential A' as defined by the NEPM (NEPC, 2013).
2	Identify the Decisions	Decisions include: <ul style="list-style-type: none"> - Do contaminant concentrations in soil comply with the investigation criteria? - Have the previous land uses affected the environmental quality of the land? - Do residual soils pose an unacceptable risk to human health or the environment?
3	Identify Inputs to Decisions	Inputs to the decision include: <ul style="list-style-type: none"> - Previous environmental data. - Relevant NSW EPA produced or endorsed criteria. - Field observations. - The results of judgemental soil sampling and laboratory analysis.
4	Define Study Boundaries	<ul style="list-style-type: none"> - Spatial Boundaries – the physical study will focus on soil within the confines of the lot boundaries as defined in Table 1. - Temporal Boundaries – as the data from the previous investigations will be relied upon for the purposes of the investigation then the temporal boundary of the Supplementary Investigation will be from 2016 to the date of the current investigation.

5	Develop Decision Rule	<p>The Site will be considered suitable for its intended land use if concentrations of soils comply with the investigation criteria, as determined by the following decision rules being applied to the data:</p> <ul style="list-style-type: none"> - The 95% Upper Confidence Limit (UCL) of the arithmetic mean for each contaminant of concern must comply with the respective investigation criteria; - The individual contaminant concentration should not exceed the investigation criteria by more than 250%, and; - The standard deviation of individual contaminants should not exceed 50% of the investigation criteria. <p>The Site will be deemed to contain contamination “hotspots” if any of the above criteria are unfulfilled.</p>
6	Specify Limits on Decision Errors	<p>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 5.</p> <p>A Site under investigation is assumed to be contaminated until statistically proven otherwise (eg: H_0= Analyte 95% UCL exceeds the Assessment Criteria), therefore two types of error are possible:</p> <ul style="list-style-type: none"> - 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. <p>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.</p>
7	Optimise Design for Obtaining Data	<ul style="list-style-type: none"> - 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.

Table 5: 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)
Adequate Laboratory Performance	>5 x LOR: 50% (laboratory)
	<5 x LOR: No Limit (laboratory)
Based on acceptance criteria of laboratory as specified on certificate of analysis, includes: blank samples, 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.
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.
	Test methods comparable between primary and secondary laboratory
	Acceptable RPD's between original samples and field duplicates and inter-laboratory duplicate samples.

4.2 Field Investigation Procedure

Field investigation carried out as part of the Supplementary Investigation comprised the collection of 14 primary soil samples from nine hand auger boreholes (BH1 to BH4, BH5/1, BH5/2, BH6 to BH8). Sampling was performed on a targeted basis in areas of the Site that were not previously subject to intrusive investigation.

For a site covering an area of approximately 8 hectares, the NSW EPA (1995) *Sampling Design Guidelines* recommend a minimum of 95 test locations be targeted for assessment. Given the fact that the site comprises an existing residential subdivision and is occupied by multiple dwellings, it was not possible to achieve the recommended sampling density. However, based on the known current and historical use of the Site, and the results from the DSI (JBS&G, 2016), it is considered that widespread contamination of the subsurface is unlikely, therefore the reduced sampling density is considered adequate for the purposes of the combined investigations.

The justification of the sampling point regime for the investigation was based on the investigator's knowledge, operational requirements and experience.

Refer to **Figure 2** – Site Layout and Supplementary Sample Locations.

4.2.1 Sample Collection

Boreholes were drilled using a hand auger to depths between 0.4m and 0.8m below ground level (bgl). Soil samples were obtained directly off the auger and immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis, zip-lock plastic bags for asbestos). Job number; sample identification number; sampler's initials and date of sampling were recorded on sample labels affixed to the sample containers.

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

Soil samples were not screened in the field for the presence of volatile organic compounds using a Photoionization Detection as all samples collected were submitted for analysis for volatile contaminants of concern.

Samples were collected by DLA staff who are specifically trained in hazardous waste field investigation techniques and health and safety procedures. Field sampling techniques used are specified in DLA Field Manual for Contaminated Sites, which are based on methods specified in the NEPM (NEPC, 2013).

4.3 Analytical Strategy

Soil samples were analysed for the contaminants of potential concern COPC presented in Table 6.

Table 6: Analytical Schedule

SOIL SAMPLES	NO. OF PRIMARY SAMPLES
Total Recoverable Hydrocarbons (TRH)	14
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)	14
Polycyclic Aromatic Hydrocarbons (PAH)	14
Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	14
Organochlorine / Organophosphorus Pesticides (OC/OP)	8
Polychlorinated Biphenyls (PCBs)	8
Asbestos (presence / absence)	8

4.4 Investigation Criteria

The investigation criteria have been derived from NEPM (NEPC, 2013) and are specific to the proposed development scenario for the Site.

The investigation criteria are not clean up criteria, but are indicative of a level of contamination above which there is a potentially unacceptable risk which may require further assessment, management or remediation.

4.4.1 Health Investigation Levels

The Health Investigation Levels (HILs) are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst case scenario for four generic land use scenarios. Considering the proposed land use, the following HIL has been adopted:

- HIL A – Residential with gardens and accessible soil.

The adopted HILs from Table 1A(1) and Table 7, Schedule B1 of NEPM (NEPC, 2013) are shown in Table 7.

Table 7: Health Investigation Levels for Soils

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		
PCB		1
Pesticides		
DDT+DDE+DDD		240
Aldrin and Dieldrin		6
Chlordane		50
Endosulfan		270
Endrin		10
Heptachlor		6
HCB		10
Methoxychlor		300
Mirex		10
Toxaphene		20
Asbestos		
Asbestos		Not Detected

Health Investigation Levels sourced 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.

4.4.2 Health Screening Levels

Health Screening Levels (HSLs) are used to assess selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact with affected soils. The HSLs were developed by the Co-operative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) and were derived through the consideration of health effects only, with particular emphasis on the vapour exposure pathway. Other considerations such as ecological risk, aesthetics, the presence of free phase product and explosive / fire risk are not addressed by the HSLs.

In order to determine whether the HSLs tabulated in Schedule B1 of NEPC (2013) are applicable or whether a site-specific determination is required, CRC CARE provide an application checklist which should be completed prior to using the HSLs. The following parameters were considered in completing the checklist:

- **Potential Contaminants** – Petroleum Hydrocarbons;
- **Land use** – HSL A;
- **Potential Pathways** – soil vapour intrusion, direct contact;
- **Media** – soil;
- **Soil Types** – clay is the dominant sub-surface profile; and
- **Depth to Contamination** – all data will be compared with the HSLs.

On the basis of these considerations, the following HSL has been adopted:

- HIL A & HSL B – Low – high density residential for ‘clay’ (or ‘fine’).

The adopted soil HSLs for vapour intrusion from Table 1A(3), Schedule B1 of NEPM (NEPC, 2013) are shown in Table 8.

Table 8: Health Screening Levels for Soils (Clay)

ANALYTES	HSL-A (Clay) 0 to 1.0m	Direct Contact HSL-A
Benzene	0.7	100
Toluene	480	14,000
Ethylbenzene	NL	4,500
Xylenes	110	12,000
Naphthalene	5	1,400
F1: C₆-C₁₀	50	4,400
F2: C₁₀-C₁₆	280	3,300
F3: C₁₆-C₃₄	NA	4,500
F4: C₃₄-C₄₀	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 – Soil Health Screening Levels for Direct Contact*.

4.4.3 Management Limits

In addition to appropriate consideration and application of the HSLs, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

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

Management Limits (ML) to avoid or minimise these potential effects have been adopted in NEPM (NEPC, 2013) as interim Tier 1 guidance.

The adopted management limits from Table 1B(7), Schedule B1 of NEPM (NEPC, 2013) are shown in Table 9.

Table 9: Management Limits for Soils (Fine)

ANALYTES	ML (Fine) Urban Residential and Public Open Space
F1: C ₆ -C ₁₀	800
F2: C ₁₀ -C ₁₆	1,000
F3: C ₁₆ -C ₃₄	3,500
F4: C ₃₄ -C ₄₀	10,000

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

4.4.4 Ecological Investigation Levels

According to NEPM (NEPC, 2013), Schedule B (5a) – *Guideline on Ecological Risk Assessment*, factors that may influence a Risk Management Decision (and therefore determine Ecological Risk Assessment outcomes) are generally based on economic, ecological or societal considerations.

Examples include:

- The size of the site, land value, cost of remediation (economic);
- The type of contaminants present, current and potential site land use, surrounding land use (societal); and
- The ecological significance (e.g. a rare and endangered species or a species that supports a valued ecological process or a sensitive introduced species of low ecological significance) of the values identified in the Receptor Identification component of Ecological Risk Assessment to be protected.

EILs have been implemented to environmentally manage the effect of contaminants on terrestrial ecosystems and species sensitivity. The EILs referenced in this report have been developed for the generic land use setting of urban residential areas and public open space. It is important to note that the contamination is assumed to be aged (>2 years), as fresh contamination associated with current industrial / agricultural activity and chemical spills are not likely present on-site. EILs have been derived for: Arsenic (As), Copper (Cu), Chromium (CrIII), DDT, naphthalene, Nickel (Ni), Lead (Pb) and Zinc (Zn).

Ambient Background Concentration (ABC)

For Ni, CrIII, Zn and Pb (aged contamination), the EILs are the sum of Added Contaminant Limits (ACLs) and Ambient Background Concentrations (ABCs). To establish the ABC of a contaminant, the recommended method is to measure the ABC at an appropriate unpolluted reference site. Sample

BH5/2 was determined to be the most appropriate unpolluted reference location for the purposes of ABCs. The sample was collected from reworked natural sandy clay at a depth of 0.5-0.8m bgl and the soils at this location are therefore considered characteristic of natural clays in the region.

For As, DDT and Naphthalene (aged contamination), the EILs are generically obtained (i.e. not dependent on soil type).

Added Contaminant Limit (ACL)

The Added Contaminant Limit (ACL) is the added contamination (in excess of the ABC). ACLs are applicable to Cr III, Cu, Ni and Zn and are based on soils properties of pH, Cation Exchange Capacity (CEC) and the clay content.

The soil type at BH5/2 was identified to be reworked natural sandy clay, allowing for a clay content percentage in excess of 90%. The pH for the soils was analysed by the laboratory to be 6.1 (rounded down to 6.0 for the purposes of deriving the ACLs). A conservative CEC of 25cmol_c/kg has been adopted in the determination of the ACLs below.

The respective soil EILs are provided in Table 10.

Table 10: Ecological Investigation Levels

ANALYTES	ABC	ACL	EIL
Arsenic	--	--	100 ¹
Chromium (III)	10	400 ²	410
Copper	2	215 ³	217
Lead	9	1,100 ⁴	1,109
Nickel	2	310 ⁵	312
Zinc	7	400 ⁶	407
DDT	--	--	180 ⁷
Naphthalene	--	--	170 ⁸

1. NEPM (NEPC, 2013) Schedule B1 Table 1B(5).
2. NEPM (NEPC, 2013) Schedule B1 Table 1B(3).
3. NEPM (NEPC, 2013) Schedule B1 Table 1B(2). CEC has been used for this calculation.
4. NEPM (NEPC, 2013) Schedule B1 Table 1B(4).
5. NEPM (NEPC, 2013) Schedule B1 Table 1B(3).
6. NEPM (NEPC, 2013) Schedule B1 Table 1B(1).
7. NEPM (NEPC, 2013) Schedule B1 Table 1B(5).
8. NEPM (NEPC, 2013) Schedule B1 Table 1B(5).

4.4.5 Ecological Screening Levels

Ecological screening levels (ESLs) have been developed for selected petroleum hydrocarbon compounds and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse and fine-grained soils and various land uses. They are generally applicable to the top 2 m of soil.

The adopted ESLs from Table 1B(6), Schedule B1 of NEPM (NEPC, 2013) are shown in Table 11.

Table 11: Ecological Screening Levels (Fine)

ANALYTES	ESL (Fine) Urban Residential and Public Open Space
Benzene	65
Toluene	105
Ethylbenzene	125
Xylenes	45
Benzo(a)Pyrene	0.7
F1: C ₆ -C ₁₀	180
F2: C ₁₀ -C ₁₆	120
F3: C ₁₆ -C ₃₄	1,300
F4: C ₃₄ -C ₄₀	5,600

Ecological Screening Levels sourced from NEPM (NEPC, 2013) *Table 1 B(6)*.

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

5.1 Field Quality Assurance / Quality Control

5.1.1 Sampling Team

Soil sampling was undertaken by Matthew Junghans, an experienced environmental consultant from DLA.

5.1.2 Field Procedures

The following field procedures were implemented as part of field quality assurance / quality control (QA/QC):

- **Sample Containers:** soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts, and zip-lock plastic bags. 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 cross contamination. Decontamination of equipment involved:
 - o Cleaning equipment in potable water to remove gross contamination;
 - o Cleaning in a solution of Decon 90; and
 - o Rinsing in clean demineralised water.
- **Chain of Custody:** samples were recorded on a chain of custody form. The chain of custody form accompanied samples upon dispatch to the NATA registered laboratories for analysis. Copies of the chain of custody forms, signed by laboratory, that acknowledged sample receipt date and time, samples received in good condition and properly chilled and documentation received in proper order, are provided in **Appendix B**;
- **Photoionisation Detector:** given that volatile contaminants were not considered a primary contaminant of concern as part of either the DSI or supplementary investigation, screening of the samples using a photoionisation detector was not considered necessary. Regardless, all soil samples collected as part of the supplementary investigations were submitted for laboratory analysis for TRH and BTEX.
- **Trip Spike / 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. Given the absence of potential sources of hydrocarbon-based contamination identified on-site at

the time of fieldwork, hydrocarbons were not considered a primary contaminant of concern. Consequently, the collection of trip spikes and trip blanks was not considered necessary. The absence of detectable volatile hydrocarbon concentrations in soil samples suggests that the loss or transfer of volatile contamination from and between soil samples is unlikely. The absence of trip spike and trip blank sample data is not considered to affect the precision or accuracy of the laboratory data, or the conclusions of the overall assessment.

- **Rinsate Blanks:** Rinsate blanks are used to assess the effectiveness of field decontamination techniques in minimising cross-contamination of samples. Rinsate blanks were not collected during fieldwork. All care was taken to remove soil adhered to the hand auger between each sampling interval, and sampling equipment was decontaminated between each borehole location. As such, the potential for cross contamination was considered minimal. The absence of rinsate blank sample data is not considered to affect the precision or accuracy of the laboratory data, or the conclusions of the overall assessment.

5.1.3 Field QA/QC Duplicate Analysis

Field duplicate samples for soil were prepared in the field 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 cooler.

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	14 Samples	2 intra-laboratory duplicate	14%
---------------------	-------------------	------------------------------	-----

An intra-laboratory duplicate rate of 14% was achieved which is greater than that recommended by the Field Quality Plan. No inter-laboratory duplicate samples were collected for analysis. Given the limited number of primary samples collected overall, the field duplicate sampling ratio is considered sufficient for the purposes of this investigation to assess the precision of the project laboratory.

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 HIL concentration.

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

Two intra-laboratory duplicate exceeded the DQO of 30% for two heavy metal concentrations. The differences in concentrations of the following intra-laboratory duplicate pair reported concentrations of less than five times the LOR:

- BH7_0.2-0.7 / BH7_0.2-0.7A for nickel (100%).

The differences in concentrations of the following intra-laboratory duplicate pairs were for reported concentrations of less than 5% of the relevant HIL concentration:

- BH7_0.2-0.7 / BH7_0.2-0.7A for nickel (100%); and
- BH7_0.2-0.7 / BH7_0.2-0.7A for zinc (44%).

It is to be noted that for samples with concentrations of less than the LOR, the concentration has been modified to half the LOR value to assist in statistical RPD calculations and data quality assessment.

RPD results are tabulated in **Appendix A** – Data Summary Tables.

5.2 Laboratory QA/QC

5.2.1 Selected Laboratory

The laboratory for used for the analysis of primary soil samples and intra-laboratory duplicate samples was Envirolab Services Pty Ltd located at Chatswood in Sydney. The analytical methods and procedures used by the laboratory are NATA certified and meet requirements of NEPM (NEPC, 2013).

5.2.2 Laboratory Control Measures

The project laboratory adopted a quality program that comprises of reagent/method blanks, matrix spikes, surrogate spikes, laboratory duplicates and laboratory control samples at or in excess of current NEPM and Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines.

5.2.3 Laboratory QA/QC Results

Soil samples were received at the laboratory in good order, with the correct documentation and were adequately chilled. All samples were analysed within the recommended holding times. The signed sample receipt advice is included on the chain of custody forms.

A laboratory quality control summary and full laboratory QA/QC checklist is included on the laboratory reports presented in **Appendix B**. Laboratory QA/QC procedures to determine the accuracy and precision of the analyses comprised the following:

- No target analytes were detected in any of the method blanks, indicating that the analytical method was satisfactory and no contamination occurred;
- Matrix spike samples were within the accepted range indicating low matrix interference;
- Surrogate spikes were within the accepted range indicating no gross errors have occurred in the analysis procedure leading to significant analyte loss;
- Laboratory control samples were within the accepted range confirming primary calibration; and
- RPDs for the duplicate control samples were found to be within the acceptable limit.

5.3 QA/QC Assessment

Based on the QA/QC results, DLA considers the field measurement data and laboratory analytical results obtained are valid and meet the data quality objectives set for this Supplementary Investigation. DLA concludes that the field and laboratory data presented herein is representative of the overall Site condition at the time of fieldwork.

6.0 RESULTS

6.1 Fieldwork Observations

Subsurface conditions are presented in detail in the borehole logs presented in **Appendix C**. The subsurface typically consisted of sandy loam topsoil to depths between 0.1m and 0.5m bgl, overlying reworked excavated siltstone / claystone bedrock.

No visual or olfactory evidence of contamination (i.e. staining or odours) was recorded during fieldwork. No anthropogenic material, including fragments of fibre cement sheeting, was observed.

6.2 Analytical Results

The results of the soil sampling are summarised below.

Refer to **Appendix A** – Data Summary Table and **Appendix B** – NATA Certified Analytical Results.

6.2.1 Total Recoverable Hydrocarbons and Monocyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported TRH and BTEX in soil at concentrations less than the adopted investigation criteria with the exception of the following:

- Sample BH8_0.0-0.4 reported TRH F2 (>C₁₀-C₁₆) at a concentration of 250mg/kg which exceeds the adopted HSL and the ESL; and
- Sample BH8_0.1-0.4 reported TRH F2 (>C₁₀-C₁₆) at a concentration of 120mg/kg which exceeds the adopted ESL.

6.2.2 Polycyclic Aromatic Hydrocarbons

The results of the laboratory analysis reported PAHs in soil at concentrations less than the laboratory LOR and the adopted investigation criteria.

6.2.3 Pesticides and Polychlorinated Biphenyls

The results of the laboratory analysis reported pesticides and PCBs in soil at concentrations less than the laboratory LOR and the adopted investigation criteria.

6.2.4 Heavy Metals

The results of the laboratory analysis reported heavy metals in soil at concentrations less than the adopted investigation criteria.

6.2.5 Asbestos

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

7.0 DISCUSSION

7.1 Soil Contamination

The objective of this Supplementary Investigation was to assess the suitability of the areas of the Site no previously subject to investigation for future residential land use from a contamination perspective.

Intrusive investigations indicated that the subsurface of the Site comprises sandy loam topsoil overlying reworked excavated siltstone / claystone bedrock.

Soil samples were collected from nine boreholes and comprised both topsoil material and reworked natural soils and bedrock. The samples were submitted for laboratory analysis for a suite of typical contaminants of potential concern.

Soil samples from borehole BH8 reported TRH F2 (>C₁₀-C₁₆) at concentrations exceeding the HSL and ESL. Hydrocarbon concentrations exceeding the HSL have the potential to pose a risk to human health through ingestion of soil, dermal contact with soil, and inhalation of vapours due to the volatile nature of the identified contamination. Vegetation in the vicinity of the impacted soil may also be affected. The vertical extent of the TRH impact was not delineated as part of the current investigation. No visual source of petroleum hydrocarbon contamination was observed during fieldwork, therefore it is considered likely that this impact is a result of a localised spillage or leakage of fuel.

Given that borehole BH8 was drilled in an area of the Site separate from the other boreholes, application of statistical analysis to further assess the risk to human health was not considered appropriate.

All other soil samples reported contaminant concentrations below the adopted investigation and screening levels. In addition, asbestos was not detected in any of the samples submitted for analysis.

7.2 Preliminary Waste Classification

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, if required. 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 that both the topsoil and underlying reworked natural material are classified as General Solid Waste, non-putrescible.

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

8.0 CONCLUSIONS AND RECOMMENDATIONS

The sampling regime and subsequent assessment undertaken as part of this Supplementary Investigation are considered to be adequate for providing supplementary data pertaining to the Site, which is to be considered in conjunction with the previously prepared DSI report (JBS&G, 2016).

The combined data presented in the DSI and this Supplementary Investigation report is considered sufficient to allow assessment of the suitability of the Site for future land use in accordance with the general requirements of SEPP 55. Reporting has been undertaken in accordance with the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011) and the *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd ed., 2006).

Based on the results of the current investigation data, DLA concludes that the area of the Site in the vicinity of borehole BH8 is not currently considered suitable for the proposed redevelopment from a contamination perspective due to the presence of TRH in soil.

Although the Site is not considered suitable for the proposed land use in its current condition, DLA considers that the Site can be made suitable with further assessment and the implementation of an appropriate remediation strategy.

Further investigation and remediation of the Site would include:

1. Delineation soil sampling and laboratory analysis;
2. Preparation of a Remediation Action Plan for the Site;
3. Remediation of the Site which would include the excavation and appropriate off-site disposal of TRH contaminated soils;
4. Validation sampling of the Site; and
5. Preparation of a Site Validation Report.

9.0 REFERENCES

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). *Summary of In-Ground Contamination – Ivanhoe Estate, Cnr Herring and Epping Roads, Macquarie Park NSW 2113*. DLA Environmental Services.

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.

JBS&G (2016). *Detailed Site Investigation – Ivanhoe Estate, Herring Road, Macquarie Park NSW*. JBS&G Pty Ltd.

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.

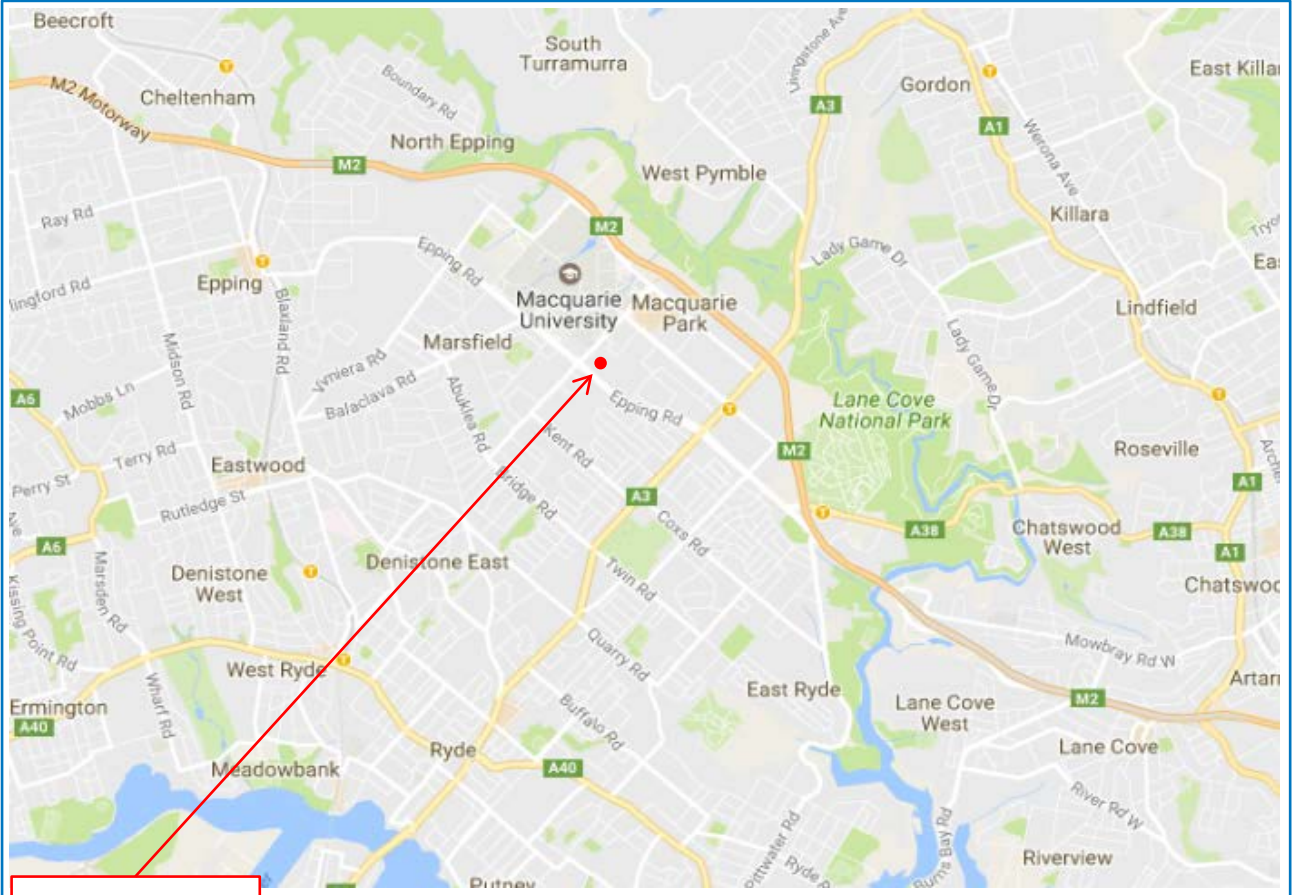
NSW EPA (1995). *Contaminated Sites: Sampling Design Guidelines*. New South Wales Environment Protection Authority.

NSW EPA (2014). *Waste Classification Guidelines, Part 1: Classifying Waste*. New South Wales Environment Protection Authority.

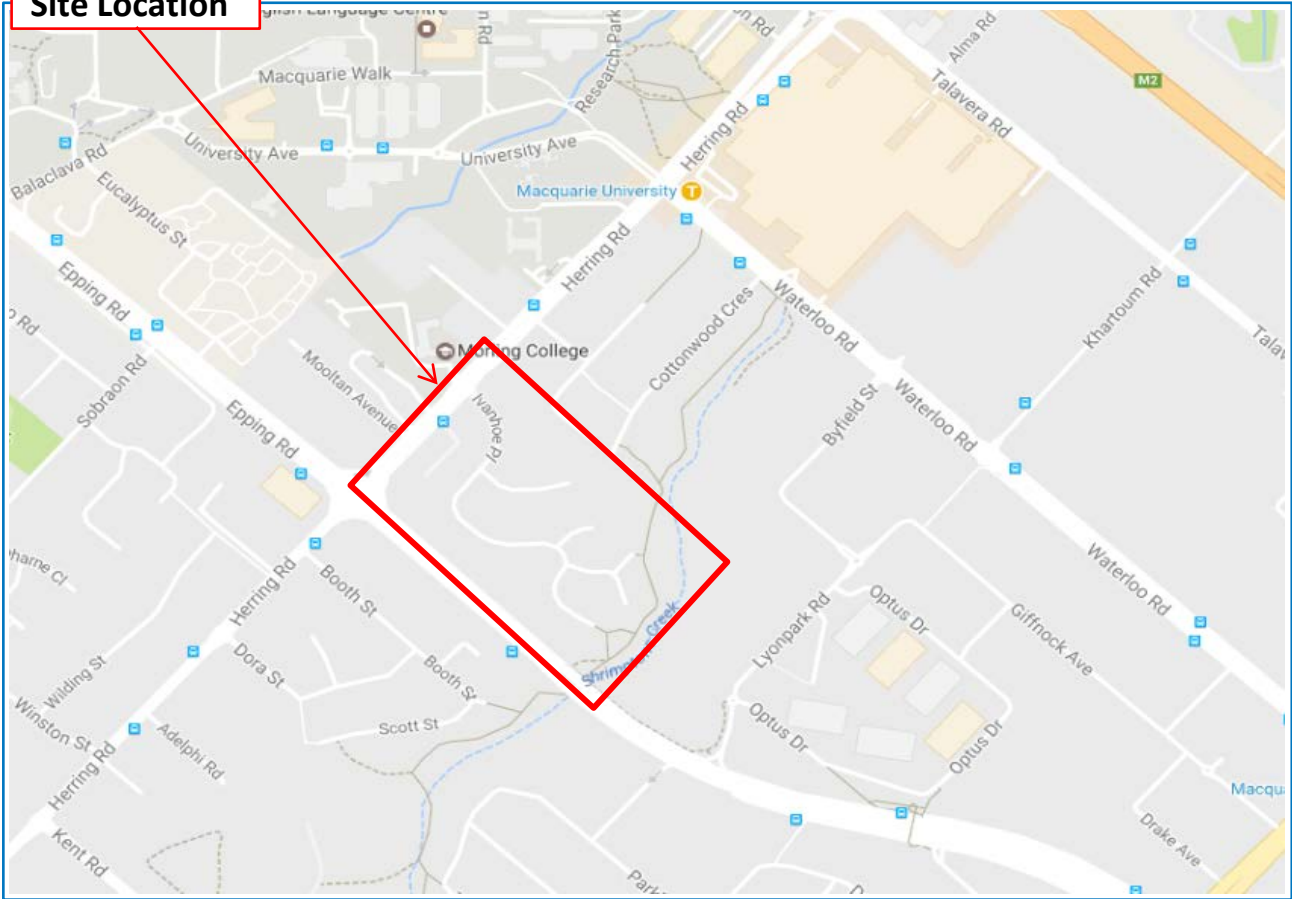
NSW OEH (2011). *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*. New South Wales Office of Environment and Heritage.

FIGURE 1

SITE LOCATION



Site Location



DESIGNED:
DLA
COMPILED:
SK
PROJ. No.
DL3953

FIGURE TITLE:
PROJECT TITLE:
CLIENT:

SITE LOCATION
Ivanhoe Estate, Macquarie Park NSW
Frasers Property Australia

DATE:
02/06/2017
FIGURE:
1

FIGURE 2

SITE LAYOUT AND SUPPLEMENTARY SAMPLE LOCATIONS



Legend

- Site Boundary
- Sample Locations (approximate)
- Altered Topography Areas



Approximate Scale



Figure Title

Additional Investigation Locations

Project Title

Ivanhoe Estate, Macquarie Park

Client

Frasers Property Australia

Project No.

DL 3953

Date

15/02/2018

Scale

As Shown

Figure No.

1


Revision

Version 1.1

APPENDIX A

DATA SUMMARY TABLES

**Table 1 - Soil Analytical Results
Supplementary Investigation
'Ivanhoe Estate'
Macquarie Park NSW**

																										
Sample ID	Depth (m)	Date	Chemical Report	Asbestos	BTEX				Naphthalene	TRH				PAH		Pesticides		PCB	Heavy Metals							
					Benzene	Toluene	Ethylbenzene	Xylene		F1	F2	F3	F4	BaP TEQ	Total PAH	OCP	OPP		As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
SITE ASSESSMENT CRITERIA																										
HIL A Residential (NEPC, 2013)				ND	-	-	-	-	-	-	-	-	-	3	300	-	-	-	100	20	100	6000	300	40	400	7400
HSL A Residential, 0-<1m, sand (NEPM, 2013)				-	0.5	160	55	40	3	45	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HSL A Direct Contact (Friebel, et al, 2011)				-	400	14000	4500	12000	1400	4400	3300	4500	6300	-	-	-	-	-	-	-	-	-	-	-	-	-
Management Limits, Urban Residential, fine (NEPC, 2013)				-	-	-	-	-	-	700	1000	2500	10000	-	-	-	-	-	-	-	-	-	-	-	-	-
EIL Urban Residential / Public Open Space (NEPC, 2013)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	410	217	1109	-	312	407
ESL Urban Residential / Public Open Space, coarse (NEPM, 2013)				-	50	85	70	45	-	180	120	300	2800	0.7	-	-	-	-	-	-	-	-	-	-	-	-
PRIMARY SAMPLES																										
BH1	0.1-0.2	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	7	<0.4	20	21	25	<0.1	8	31
BH1	0.2-0.5	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	17	18	32	<0.1	7	29
BH2	0.1-0.4	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	5	<0.4	45	17	11	<0.1	36	25
BH2	0.5-0.6	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	14	12	16	<0.1	3	7
BH3	0.0-0.1	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	8	<0.4	23	8	22	<0.1	4	16
BH3	0.1-0.8	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	7	<0.4	14	17	22	<0.1	2	16
BH4	0.1-0.2	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	8	<0.4	9	5	6	<0.1	7	17
BH4	0.2-0.4	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	5	<0.4	18	18	14	<0.1	14	33
BH5/1	0.1-0.5	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	6	8	8	<0.1	5	32
BH5/2	0.5-0.8	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	-	-	-	<4	<0.4	10	2	9	<0.1	2	7
BH6	0.1-0.5	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	8	2	8	<0.1	1	4
BH7	0.2-0.7	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	10	3	8	<0.1	1	7
BH8	0.0-0.1	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	250	650	170	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	14	8	14	<0.1	3	22
BH8	0.1-0.4	24-May-17	167858	-	<0.2	<0.5	<1	<1	<1	<25	120	180	<100	<0.5	<0.05	-	-	-	<4	<0.4	12	5	12	<0.1	2	13
INTRA-LABORATORY DUPLICATE																										
BH2	0.1-0.4A	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	4	<0.4	44	20	11	<0.1	42	29
BH7	0.2-0.7A	24-May-17	167858	ND	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05	<0.1	<0.1	<0.1	<4	<0.4	10	4	8	<0.1	3	11
STATISTICAL ANALYSIS																										
Min	MiMin				0	0	0	0	0	0	120	140	170	0	0	0	0	0	5	0	6	2	6	0	1	4
Max	MaMax				0	0	0	0	0	0	250	650	170	0	0	0	0	0	8	0	45	21	32	0	36	33
Avg	AvAvg				-	-	-	-	-	-	185	323	170	-	-	-	-	-	7	-	16	10	15	-	7	19
Stdev					-	-	-	-	-	-	92	284	-	-	-	-	-	-	1	-	10	7	8	-	9	10

Reported in mg/kg unless stated otherwise

* Depth relates to Depth Below Surface Level


nd = not detected above laboratory LOR


NL = Not Limiting

RED = Exceeds HIL Criteria

YELLOW = Exceeds EIL Criteria

**Table 2 - RPD Results
Supplementary Investigation
'Ivanhoe Estate'
Macquarie Park NSW**

													
Sample ID	Date	Report	BTEX				Naphthalene	TRH				PAH	
			Benzene	Toluene	EthylBenzene	Xylene		F1	F2	F3	F4	B(a)P TEQ	Total
INTRA-LABORATORY													
BH2_0.1-0.4	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
BH2_0.1-0.4A	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05
RPD			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7_0.2-0.7	24-May-17	167858	<0.2	<0.5	<1	<1	<1	<25	<50	<100	<100	<0.5	<0.05
BH7_0.2-0.7A	24-May-17	167858.0	<0.2	<0.5	<1	<1	<1	<25	<50	140	<100	<0.5	<0.05
RPD			NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

										
Sample ID	Date	Report	Heavy Metals							
			As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
INTRA-LABORATORY										
BH2_0.1-0.4	24-May-17	167858	5	<0.4	45	17	11	<0.1	36	25
BH2_0.1-0.4A	24-May-17	167858	4	<0.4	44	20	11	<0.1	42	29
RPD			22%	NA	2%	16%	0%	NA	15%	15%
BH7_0.2-0.7	24-May-17	167858	<4	<0.4	10	3	8	<0.1	1	7
BH7_0.2-0.7A	24-May-17	167858	<4	<0.4	10	4	8	<0.1	3	11
RPD			NA	NA	0%	29%	0%	NA	100%	44%

APPENDIX B

NATA CERTIFIED ANALYTICAL DATA



CERTIFICATE OF ANALYSIS

167858

Client:

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

Attention: Matthew Junghans

Sample log in details:

Your Reference:	DL3953 - Maq Parts
No. of samples:	16 soils
Date samples received / completed instructions received	25/05/17 / 25/05/17

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: 1/06/17 / 30/05/17
Date of Preliminary Report: Not Issued

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Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-2 BH1	167858-3 BH2	167858-4 BH2	167858-5 BH2
Depth	-----	0.1-0.2	0.2-0.5	0.1-0.4	0.1-0.4A	0.6
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	90	101	106	94	93

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	167858-6 BH3	167858-7 BH3	167858-8 BH4	167858-9 BH4	167858-10 BH5/1
Depth	-----	0.1-0.1	0.1-0.8	0.1-0.2	0.2-0.4	0.1-0.5
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	105	94	89	106	93

Client Reference: DL3953 - Maq Parts

vTRH(C6-C10)/BTEX in Soil Our Reference: Your Reference	UNITS ----- -	167858-11 BH5/2	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth	-----	0.5-0.8	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	27/05/2017	27/05/2017	27/05/2017	27/05/2017	27/05/2017
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	%	101	97	103	98	94

vTRH(C6-C10)/BTEX in Soil Our Reference: Your Reference	UNITS ----- -	167858-16 BH8
Depth	-----	0.1-0.4
Date Sampled		24/05/2017
Type of sample		Soil
Date extracted	-	26/05/2017
Date analysed	-	27/05/2017
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	88

Client Reference: DL3953 - Maq Parts

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-2 BH1	167858-3 BH2	167858-4 BH2	167858-5 BH2
Depth	-----	0.1-0.2	0.2-0.5	0.1-0.4	0.1-0.4A	0.6
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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 (>C ₁₀ -C ₄₀)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	89	87	89	89	87

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	167858-6 BH3	167858-7 BH3	167858-8 BH4	167858-9 BH4	167858-10 BH5/1
Depth	-----	0.1-0.1	0.1-0.8	0.1-0.2	0.2-0.4	0.1-0.5
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	110	<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	140	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C ₁₀ -C ₄₀)	mg/kg	140	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	90	88	89	87

Client Reference: DL3953 - Maq Parts

svTRH (C10-C40) in Soil	UNITS	167858-11	167858-12	167858-13	167858-14	167858-15
Our Reference:	-----	BH5/2	BH6	BH7	BH7	BH8
Your Reference	-					
Depth	-----	0.5-0.8	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	470
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	440
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	250
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	250
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	650
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	170
Total +ve TRH (>C ₁₀ -C ₄₀)	mg/kg	<50	<50	<50	<50	1,100
Surrogate o-Terphenyl	%	88	90	88	89	105

svTRH (C10-C40) in Soil	UNITS	167858-16
Our Reference:	-----	BH8
Your Reference	-	
Depth	-----	0.1-0.4
Date Sampled		24/05/2017
Type of sample		Soil
Date extracted	-	26/05/2017
Date analysed	-	26/05/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	170
TRHC ₂₉ - C ₃₆	mg/kg	140
TRH>C ₁₀ -C ₁₆	mg/kg	120
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	120
TRH>C ₁₆ -C ₃₄	mg/kg	180
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C ₁₀ -C ₄₀)	mg/kg	300
Surrogate o-Terphenyl	%	103

Client Reference: DL3953 - Maq Parts

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-2 BH1	167858-3 BH2	167858-4 BH2	167858-5 BH2
Depth	-----	0.1-0.2	0.2-0.5	0.1-0.4	0.1-0.4A	0.6
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
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	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ 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	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	117	118	113	115	114

Client Reference: DL3953 - Maq Parts

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	167858-6 BH3	167858-7 BH3	167858-8 BH4	167858-9 BH4	167858-10 BH5/1
Depth	-----	0.1-0.1	0.1-0.8	0.1-0.2	0.2-0.4	0.1-0.5
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
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	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ 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	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	122	117	115	117	115

Client Reference: DL3953 - Maq Parts

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	167858-11 BH5/2	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth	-----	0.5-0.8	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
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	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ 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	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	114	115	118	115	122

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	167858-16 BH8
Depth Date Sampled Type of sample	----- ----- -----	0.1-0.4 24/05/2017 Soil
Date extracted	-	26/05/2017
Date analysed	-	29/05/2017
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Total +ve PAH's	mg/kg	<0.05
Surrogate <i>p</i> -Terphenyl-d14	%	128

Organochlorine Pesticides in soil		167858-1	167858-3	167858-4	167858-6	167858-8
Our Reference:	UNITS	BH1	BH2	BH2	BH3	BH4
Your Reference	-----					
Depth	-	0.1-0.2	0.1-0.4	0.1-0.4A	0.1-0.1	0.1-0.2
Date Sampled	-----	24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	89	97	91	88	90

Organochlorine Pesticides in soil	UNITS	167858-10	167858-12	167858-13	167858-14	167858-15
Our Reference:	-----	BH5/1	BH6	BH7	BH7	BH8
Your Reference	-					
Depth	-----	0.1-0.5	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	91	89	90	90	88

Client Reference: DL3953 - Maq Parts

Organophosphorus Pesticides	UNITS	167858-1	167858-3	167858-4	167858-6	167858-8
Our Reference:	-----	BH1	BH2	BH2	BH3	BH4
Your Reference	-					
Depth	-----	0.1-0.2	0.1-0.4	0.1-0.4A	0.1-0.1	0.1-0.2
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	89	97	91	88	90

Organophosphorus Pesticides	UNITS	167858-10	167858-12	167858-13	167858-14	167858-15
Our Reference:	-----	BH5/1	BH6	BH7	BH7	BH8
Your Reference	-					
Depth	-----	0.1-0.5	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	91	89	90	90	88

Client Reference: DL3953 - Maq Parts

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-3 BH2	167858-4 BH2	167858-6 BH3	167858-8 BH4
Depth	-----	0.1-0.2	0.1-0.4	0.1-0.4A	0.1-0.1	0.1-0.2
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	89	97	91	88	90

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	167858-10 BH5/1	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth	-----	0.1-0.5	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
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	%	91	89	90	90	88

Client Reference: DL3953 - Maq Parts

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-2 BH1	167858-3 BH2	167858-4 BH2	167858-5 BH2
Depth	-----	0.1-0.2	0.2-0.5	0.1-0.4	0.1-0.4A	0.6
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Arsenic	mg/kg	7	7	5	4	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	20	17	45	44	14
Copper	mg/kg	21	18	17	20	12
Lead	mg/kg	25	32	11	11	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	7	36	42	3
Zinc	mg/kg	31	29	25	29	7

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	167858-6 BH3	167858-7 BH3	167858-8 BH4	167858-9 BH4	167858-10 BH5/1
Depth	-----	0.1-0.1	0.1-0.8	0.1-0.2	0.2-0.4	0.1-0.5
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Arsenic	mg/kg	8	7	8	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	23	14	9	18	6
Copper	mg/kg	8	17	5	18	8
Lead	mg/kg	22	22	6	14	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	2	7	14	5
Zinc	mg/kg	16	16	17	33	32

Client Reference: DL3953 - Maq Parts

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	167858-11 BH5/2	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth	-----	0.5-0.8	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled		24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	8	10	10	14
Copper	mg/kg	2	2	3	4	8
Lead	mg/kg	9	8	8	8	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	1	1	3	3
Zinc	mg/kg	7	4	7	11	22

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	167858-16 BH8
Depth	-----	0.1-0.4
Date Sampled		24/05/2017
Type of sample		Soil
Date prepared	-	26/05/2017
Date analysed	-	26/05/2017
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	12
Copper	mg/kg	5
Lead	mg/kg	12
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	13

Misc Inorg - Soil Our Reference: Your Reference	UNITS ----- -	167858-12 BH6
Depth Date Sampled Type of sample	-----	0.1-0.5 24/05/2017 Soil
Date prepared	-	29/05/2017
Date analysed	-	29/05/2017
pH 1:5 soil:water	pH Units	6.1
Electrical Conductivity 1:5 soil:water	µS/cm	48

Client Reference: DL3953 - Maq Parts

Moisture Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-2 BH1	167858-3 BH2	167858-4 BH2	167858-5 BH2
Depth Date Sampled Type of sample	----- ----- -----	0.1-0.2 24/05/2017 Soil	0.2-0.5 24/05/2017 Soil	0.1-0.4 24/05/2017 Soil	0.1-0.4A 24/05/2017 Soil	0.6 24/05/2017 Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
Moisture	%	10	8.5	7.9	9.9	11

Moisture Our Reference: Your Reference	UNITS ----- -	167858-6 BH3	167858-7 BH3	167858-8 BH4	167858-9 BH4	167858-10 BH5/1
Depth Date Sampled Type of sample	----- ----- -----	0.1-0.1 24/05/2017 Soil	0.1-0.8 24/05/2017 Soil	0.1-0.2 24/05/2017 Soil	0.2-0.4 24/05/2017 Soil	0.1-0.5 24/05/2017 Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
Moisture	%	14	9.7	7.9	9.0	8.6

Moisture Our Reference: Your Reference	UNITS ----- -	167858-11 BH5/2	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth Date Sampled Type of sample	----- ----- -----	0.5-0.8 24/05/2017 Soil	0.1-0.5 24/05/2017 Soil	0.2-0.7 24/05/2017 Soil	0.2-0.7A 24/05/2017 Soil	0.1-0.1 24/05/2017 Soil
Date prepared	-	26/05/2017	26/05/2017	26/05/2017	26/05/2017	26/05/2017
Date analysed	-	29/05/2017	29/05/2017	29/05/2017	29/05/2017	29/05/2017
Moisture	%	9.5	6.3	8.9	8.6	15

Moisture Our Reference: Your Reference	UNITS ----- -	167858-16 BH8
Depth Date Sampled Type of sample	----- ----- -----	0.1-0.4 24/05/2017 Soil
Date prepared	-	26/05/2017
Date analysed	-	29/05/2017
Moisture	%	7.0

Client Reference: DL3953 - Maq Parts

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	167858-1 BH1	167858-3 BH2	167858-4 BH2	167858-6 BH3	167858-8 BH4
Depth	----- -	0.1-0.2	0.1-0.4	0.1-0.4A	0.1-0.1	0.1-0.2
Date Sampled	24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample	Soil	Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/05/2017	30/05/2017	30/05/2017	30/05/2017	30/05/2017
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 45g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown sandy soil
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: Your Reference	UNITS ----- -	167858-10 BH5/1	167858-12 BH6	167858-13 BH7	167858-14 BH7	167858-15 BH8
Depth	----- -	0.1-0.5	0.1-0.5	0.2-0.7	0.2-0.7A	0.1-0.1
Date Sampled	24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017	24/05/2017
Type of sample	Soil	Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/05/2017	30/05/2017	30/05/2017	30/05/2017	30/05/2017
Sample mass tested	g	Approx. 40g	Approx. 45g	Approx. 35g	Approx. 35g	Approx. 35g
Sample Description	-	Brown sandy soil	Brown sandy soil	Brown sandy soil	Brown sandy soil	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

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-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.

MethodID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
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.
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.

Client Reference: DL3953 - Maq Parts

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	167858-1	<25 <25	LCS-9	102%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	167858-1	<25 <25	LCS-9	102%
Benzene	mg/kg	0.2	Org-016	<0.2	167858-1	<0.2 <0.2	LCS-9	107%
Toluene	mg/kg	0.5	Org-016	<0.5	167858-1	<0.5 <0.5	LCS-9	101%
Ethylbenzene	mg/kg	1	Org-016	<1	167858-1	<1 <1	LCS-9	96%
m+p-xylene	mg/kg	2	Org-016	<2	167858-1	<2 <2	LCS-9	103%
o-Xylene	mg/kg	1	Org-016	<1	167858-1	<1 <1	LCS-9	98%
naphthalene	mg/kg	1	Org-014	<1	167858-1	<1 <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	101	167858-1	90 96 RPD: 6	LCS-9	104%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	167858-1	<50 <50	LCS-9	96%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	167858-1	<100 <100	LCS-9	98%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	167858-1	<100 <100	LCS-9	87%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	167858-1	<50 <50	LCS-9	96%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	167858-1	<100 <100	LCS-9	98%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	167858-1	<100 <100	LCS-9	87%
Surrogate o-Terphenyl	%		Org-003	103	167858-1	89 91 RPD: 2	LCS-9	119%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			29/05/2017	167858-1	29/05/2017 29/05/2017	LCS-9	29/05/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	107%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	92%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	114%
Anthracene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	116%
Pyrene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	121%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	LCS-9	110%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	167858-1	<0.2 <0.2	[NR]	[NR]

Client Reference: DL3953 - Maq Parts

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	167858-1	<0.05 <0.05	LCS-9	117%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	123	167858-1	117 122 RPD: 4	LCS-9	112%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
HCB	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	108%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	99%
Heptachlor	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	109%
delta-BHC	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	95%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	107%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	120%
Dieldrin	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	111%
Endrin	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	110%
pp-DDD	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	114%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	LCS-9	109%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	98	167858-1	89 90 RPD: 1	LCS-9	116%

Client Reference: DL3953 - Maq Parts

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base Duplicate %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	81%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	84%
Dimethoate	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	88%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	82%
Malathion	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	77%
Parathion	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	83%
Ronnel	mg/kg	0.1	Org-008	<0.1	167858-1	<0.1 <0.1	LCS-9	87%
Surrogate TCMX	%		Org-008	98	167858-1	89 90 RPD: 1	LCS-9	91%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base Duplicate %RPD		
Date extracted	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	LCS-9	100%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	167858-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	98	167858-1	89 90 RPD: 1	LCS-9	91%

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base Duplicate %RPD		
Date prepared	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Date analysed	-			26/05/2017	167858-1	26/05/2017 26/05/2017	LCS-9	26/05/2017
Arsenic	mg/kg	4	Metals-020	<4	167858-1	7 7 RPD: 0	LCS-9	115%
Cadmium	mg/kg	0.4	Metals-020	<0.4	167858-1	<0.4 <0.4	LCS-9	98%
Chromium	mg/kg	1	Metals-020	<1	167858-1	20 19 RPD: 5	LCS-9	107%
Copper	mg/kg	1	Metals-020	<1	167858-1	21 17 RPD: 21	LCS-9	110%
Lead	mg/kg	1	Metals-020	<1	167858-1	25 28 RPD: 11	LCS-9	102%
Mercury	mg/kg	0.1	Metals-021	<0.1	167858-1	<0.1 <0.1	LCS-9	97%
Nickel	mg/kg	1	Metals-020	<1	167858-1	8 6 RPD: 29	LCS-9	98%
Zinc	mg/kg	1	Metals-020	<1	167858-1	31 32 RPD: 3	LCS-9	101%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Inorg - Soil						Base Duplicate %RPD		
Date prepared	-			29/05/2017	[NT]	[NT]	LCS-9	29/05/2017
Date analysed	-			29/05/2017	[NT]	[NT]	LCS-9	29/05/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-9	102%
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-9	100%
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD		Spike Sm#	Spike % Recovery	
vTRH(C6-C10)/BTEXN in Soil								
Date extracted	-	167858-10		26/05/2017 26/05/2017		167858-3	26/05/2017	
Date analysed	-	167858-10		26/05/2017 26/05/2017		167858-3	26/05/2017	
TRHC ₆ - C ₉	mg/kg	167858-10		<25 <25		167858-3	81%	
TRHC ₆ - C ₁₀	mg/kg	167858-10		<25 <25		167858-3	81%	
Benzene	mg/kg	167858-10		<0.2 <0.2		167858-3	82%	
Toluene	mg/kg	167858-10		<0.5 <0.5		167858-3	81%	
Ethylbenzene	mg/kg	167858-10		<1 <1		167858-3	74%	
m+p-xylene	mg/kg	167858-10		<2 <2		167858-3	83%	
o-Xylene	mg/kg	167858-10		<1 <1		167858-3	75%	
naphthalene	mg/kg	167858-10		<1 <1		[NR]	[NR]	
Surrogate aaa-Trifluorotoluene	%	167858-10		93 101 RPD: 8		167858-3	107%	

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QUALITYCONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
TRHC ₁₀ - C ₁₄	mg/kg	167858-10	<50 <50	167858-3	103%
TRHC ₁₅ - C ₂₃	mg/kg	167858-10	<100 <100	167858-3	107%
TRHC ₂₃ - C ₃₆	mg/kg	167858-10	<100 <100	167858-3	113%
TRH>C ₁₀ -C ₁₆	mg/kg	167858-10	<50 <50	167858-3	103%
TRH>C ₁₆ -C ₃₄	mg/kg	167858-10	<100 <100	167858-3	107%
TRH>C ₃₄ -C ₄₀	mg/kg	167858-10	<100 <100	167858-3	113%
Surrogate o-Terphenyl	%	167858-10	87 89 RPD: 2	167858-3	89%
QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	29/05/2017 29/05/2017	167858-3	29/05/2017
Naphthalene	mg/kg	167858-10	<0.1 <0.1	167858-3	107%
Acenaphthylene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	167858-10	<0.1 <0.1	167858-3	89%
Phenanthrene	mg/kg	167858-10	<0.1 <0.1	167858-3	103%
Anthracene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	167858-10	<0.1 <0.1	167858-3	110%
Pyrene	mg/kg	167858-10	<0.1 <0.1	167858-3	121%
Benzo(a)anthracene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	167858-10	<0.1 <0.1	167858-3	102%
Benzo(b,j+k)fluoranthene	mg/kg	167858-10	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	167858-10	<0.05 <0.05	167858-3	114%
Indeno(1,2,3-c,d)pyrene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	167858-10	115 118 RPD: 3	167858-3	116%

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QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
HCB	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	167858-10	<0.1 <0.1	167858-3	105%
gamma-BHC	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	167858-10	<0.1 <0.1	167858-3	98%
Heptachlor	mg/kg	167858-10	<0.1 <0.1	167858-3	106%
delta-BHC	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	167858-10	<0.1 <0.1	167858-3	92%
Heptachlor Epoxide	mg/kg	167858-10	<0.1 <0.1	167858-3	103%
gamma-Chlordane	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	167858-10	<0.1 <0.1	167858-3	117%
Dieldrin	mg/kg	167858-10	<0.1 <0.1	167858-3	108%
Endrin	mg/kg	167858-10	<0.1 <0.1	167858-3	106%
pp-DDD	mg/kg	167858-10	<0.1 <0.1	167858-3	111%
Endosulfan II	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	167858-10	<0.1 <0.1	167858-3	104%
Methoxychlor	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	167858-10	91 90 RPD: 1	167858-3	114%

Client Reference: DL3953 - Maq Parts

QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Azinphos-methyl (Guthion)	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	167858-10	<0.1 <0.1	167858-3	83%
Chlorpyriphos-methyl	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	167858-10	<0.1 <0.1	167858-3	89%
Dimethoate	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	167858-10	<0.1 <0.1	167858-3	92%
Fenitrothion	mg/kg	167858-10	<0.1 <0.1	167858-3	104%
Malathion	mg/kg	167858-10	<0.1 <0.1	167858-3	78%
Parathion	mg/kg	167858-10	<0.1 <0.1	167858-3	83%
Ronnel	mg/kg	167858-10	<0.1 <0.1	167858-3	88%
Surrogate TCMX	%	167858-10	91 90 RPD: 1	167858-3	91%
QUALITYCONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Aroclor 1016	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	167858-10	<0.1 <0.1	167858-3	100%
Aroclor 1260	mg/kg	167858-10	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	167858-10	91 90 RPD: 1	167858-3	91%
QUALITYCONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Date analysed	-	167858-10	26/05/2017 26/05/2017	167858-3	26/05/2017
Arsenic	mg/kg	167858-10	<4 <4	167858-3	91%
Cadmium	mg/kg	167858-10	<0.4 <0.4	167858-3	80%
Chromium	mg/kg	167858-10	6 6 RPD: 0	167858-3	123%
Copper	mg/kg	167858-10	8 10 RPD: 22	167858-3	121%
Lead	mg/kg	167858-10	8 9 RPD: 12	167858-3	81%
Mercury	mg/kg	167858-10	<0.1 <0.1	167858-3	98%
Nickel	mg/kg	167858-10	5 5 RPD: 0	167858-3	119%
Zinc	mg/kg	167858-10	32 38 RPD: 17	167858-3	93%

Report Comments:

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

Note: Samples 167858-1, 3, 4, 6, 8, 10, 12 to 15 were sub-sampled from jars provided by the client.

Asbestos ID was analysed by Approved Identifier: Lucy Zhu
Asbestos ID was authorised by Approved Signatory: Lulu Scott

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/PCB/Met/Phen
- 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

Client: DLA
Contact Person: Matthew Joughans
Project Mgr: 11
Sampler: 11
Address: Unit 3/38 Leighton Place
Hornsby
Mob:
Phone:
Email: Sydney@dlaenvironmental.com.au

Client Project Name / Number / Site etc (ie report title):
DL 30153 - Myg Pits
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 -
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	1	2	3	4	5	6	7	8		9	10	11	12	13	14	15	16				
1	BH1 - 0.1-20.2		24.5.17	Soil	X																				
2	11 - 0.2-20.5																								
3	BH2 - 0.1-70.4																								
4	11 11 11 A																								
5	11 - 0.6																								
6	BH3 - 0.1-70.1																								
7	11 - 0.1-70.8																								
8	BH4 - 0.1-70.2																								
9	11 - 0.2-70.4																								
10	BH51 - 0.1-70.5																								
11	11/2 - 0.5-70.8																								
12	BH6 - 0.1-70.5																								
13	BH7 - 0.2-70.7																								
14	11 - 11 11 A																								
15	BH8 - 0.1-70.1																								
16	11 - 0.1-70.4																								

Envirolab Services:
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 167858
Date Received: 25/5
Time Received: 14:15
Received by: [Signature]
Temp: Ambient
Cooling: Ice/No Cool
Security: Intact/Broken/None

Relinquished by (Company): DLA
Print Name: Matthew Joughans
Date & Time: 25.5.17
Signature: [Signature]
Received by (Company): ELS
Print Name: DW
Date & Time: 25/5/17
Signature: [Signature]

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 6.5 (if applicable)
Transported by: Hand delivered / courier
 White - Lab copy / Blue - Client copy / Pink - Retain in Book Page No:

APPENDIX C

BOREHOLE LOGS



Borelog

Location BH1

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, pale brown, sandstone fragments and siltstone / claystone fragments			BH1_0.1-0.2	
	0.2			Reworked natural: siltstone / claystone, weathered, with sandstone fragments			BH1_0.2-0.5	
	0.3							
	0.4							
	0.5							
	0.6			Borehole BH1 terminated at 0.5m depth on extremely compacted material				
	0.7							
	0.8							
	0.9							
	1.0							

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
HA - Hand Auger	Friable - Fb				



Borelog

Location **BH2**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH2_0.1-0.4 (BH2_0.1-0.4A)	
	0.2							
	0.3							
	0.4							
	0.5			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH2_0.5-0.6	
	0.6							
	0.7			Borehole BH2 terminated at 0.6m depth on sandstone interface				
	0.8							
	0.9							
	1.0							

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location BH3

Client: Frasers Property Australia	Job Type: Supplementary Investigation
Project No: DL3953	Address: Ivanhoe Estate, Macquarie Park NSW
Date: 24/05/2017	Logged By: MJ
Contractor: -	Method: Hand auger
Hole Size: 100mm diameter	Co-ordinates: Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH3_0.0-0.1	
	0.2			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH3_0.1-0.8	
	0.3							
	0.4							
	0.5							
	0.6							
	0.7							
	0.8							
	0.9			Borehole BH3 terminated at 0.8m depth on extremely compacted material				
	1.0							

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location BH4

Client: Frasers Property Australia	Job Type: Supplementary Investigation
Project No: DL3953	Address: Ivanhoe Estate, Macquarie Park NSW
Date: 24/05/2017	Logged By: MJ
Contractor: -	Method: Hand auger
Hole Size: 100mm diameter	Co-ordinates: Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments	
HA	0.0 - 0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel					
	0.1 - 0.2			FILL: sand, yellow			BH4_0.1-0.2		
	0.2 - 0.4			Reworked natural: sandy silty clay, fine to coarse grained, brown to pale brown, with grey orange siltstone / claystone fragments				BH4_0.2-0.4	
	0.4 - 0.6			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone					
	0.6 - 1.0			Borehole BH4 terminated at 0.6m depth on extremely compacted material					

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location **BH5 / 1**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2 0.3 0.4 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH5/1_0.1-0.5	
	0.6 0.7 0.8			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone				
	0.9 1.0			Borehole BH5/1 terminated at 0.8m depth on extremely compacted material				

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location **BH5 / 2**

Client:	Frasers Property Australia	Job Type:	Supplementary Investigation
Project No:	DL3953	Address:	Ivanhoe Estate, Macquarie Park NSW
Date:	24/05/2017	Logged By:	MJ
Contractor:	-	Method:	Hand auger
Hole Size	100mm diameter	Co-ordinates:	Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2 0.3 0.4 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel				
	0.6 0.7 0.8			Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH5/2_0.5-0.8	
	0.9 1.0			Borehole BH5/2 terminated at 0.8m depth on extremely compacted material				

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location BH6

Client: Frasers Property Australia	Job Type: Supplementary Investigation
Project No: DL3953	Address: Ivanhoe Estate, Macquarie Park NSW
Date: 24/05/2017	Logged By: MJ
Contractor: -	Method: Hand auger
Hole Size: 100mm diameter	Co-ordinates: Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1 0.2 0.3 0.4 0.5			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH6_0.1-0.5	
	0.6 0.7 0.8 0.9 1.0			Borehole BH6 terminated at 0.5m depth on underground services				

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location BH7

Client: Frasers Property Australia	Job Type: Supplementary Investigation
Project No: DL3953	Address: Ivanhoe Estate, Macquarie Park NSW
Date: 24/05/2017	Logged By: MJ
Contractor: -	Method: Hand auger
Hole Size: 100mm diameter	Co-ordinates: Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1	[Hatched pattern]		TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel				
	0.2	[Hatched pattern]		Reworked natural: sandy clay, pale brown, fine to coarse sandstone gravel and crushed sandstone			BH7_0.2-0.7 (BH7_0.2-0.7A)	
	0.3	[Hatched pattern]						
	0.4	[Hatched pattern]						
	0.5	[Hatched pattern]						
	0.6	[Hatched pattern]						
	0.7	[Hatched pattern]		Borehole BH7 terminated at 0.7m depth on extremely compacted material				
	0.8	[Hatched pattern]						
	0.9	[Hatched pattern]						
	1.0	[Hatched pattern]						

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				



Borelog

Location BH8

Client: Frasers Property Australia	Job Type: Supplementary Investigation
Project No: DL3953	Address: Ivanhoe Estate, Macquarie Park NSW
Date: 24/05/2017	Logged By: MJ
Contractor: -	Method: Hand auger
Hole Size: 100mm diameter	Co-ordinates: Not surveyed

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Density / Stiffness	Sampling	Comments
HA	0.1			TOPSOIL: sandy loam, brown to pale brown, with roadbase and fine to coarse gravel			BH8_0.0-0.1	
	0.2			Reworked natural: siltstone / claystone, weathered, with sandstone fragments			BH8_0.1-0.4	
	0.3							
	0.4							
	0.5			Borehole BH8 terminated at 0.4m depth on extremely compacted material				
	0.6							
	0.7							
	0.8							
	0.9							
	1.0							

Notes:					Sheet 1 of 1
Method:	Consistency	Plasticity	Moisture	Density	
SS - Solid Flight Auger	VS - Very Soft	HP - HighlyPlastic	D - Dry	VL - Very Loose	
HS - Hollow Flight Auger	S - Soft	MP - Medium Plasticity	M - Moist	L - Loose	
CC - Concrete Core	F - Firm	LP - Low Plasticity	W - Wet	MD - Medium Density	
PT - Push Tube	VS - Very Stiff			D - Dense	
RC - Rock Coring	H - Hard			VD - Very Dense	
	Friable - Fb				