NSW Land and Housing Corporation
Department of Family and Housing Services

Detailed Site Investigation

Ivanhoe Estate
Herring Road, Macquarie Park, NSW

30 September 2016

52047/104956 (Rev A)

JBS&G

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Abbreviations

Term	Definition
ACM	Asbestos Containing Materials
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
B(a)P	Benzo(a)pyrene
CoPC	Contaminant of Potential Concern
DECCW	NSW Department of Environment, Climate Change and Water
DP	Deposited Plan
DQIs	Data Quality Indicators
DQOs	Data Quality Objectives
EPA	NSW Environment Protection Authority
HIL	Health Investigation Level
HSL	Health Screening Level
LEP	Local Environmental Plan
LOR	Limit of Reporting
NEPC	National Environment Protection Council
OCP	Organochlorine pesticide
OEH	NSW Office of Environment and Heritage (includes EPA)
PAHs	Polycyclic Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photo-ionisation Detector
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
UCL	Upper Confidence Limit
TRH	Total Recoverable Hydrocarbons
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by New South Wales Land and Housing Corporation - Department of Family and Community Services (LAHC, the client) for the provision of environmental consulting services associated with the Ivanhoe Estate, located off Herring Road, Macquarie Park, NSW (the site).

The site is legally identified as Lots 6 to 20 in Deposited Plan (DP) 861433 and Lot 5 in DP 740753, occupying a combined total area of approximately 8 hectares (ha). The site currently comprises 259 social housing dwellings, and the primary land use at the time of the investigation was residential with several supporting local access roads and landscaping/public open space. A child care centre is located in the central portion of the site. Current land zoning includes B4 – Mixed Use and RE1 – Public Recreation. JBS&G understand that the client intends to redevelop the estate in keeping with the mixed land use and public recreation areas.

JBS&G completed a due diligence environmental site assessment, otherwise referred to as a preliminary site investigation (PSI), for the site in April 2016. The PSI identified areas of environmental concern (AEC) relating to historical agricultural/market garden activities, application and storage of herbicides/pesticides and heavy metals, areas of historical filling, creek bed sediments and surficial drainage lines possibly impacted by accumulated contaminants in surface water and sediments, electrical transformers, hazardous building materials associated with existing and former site structures, and accumulation and incineration of waste. The client requires a DSI to assess the extent of potential contamination prior to development.

The objectives of the DSI are to characterise potential contamination at the site, to draw conclusions regarding the potential suitability of the site for proposed land uses, and, if required, make recommendations for further investigation and/or management to make the site suitable for the proposed land uses.

To achieve the objectives of the DSI, the following work was completed. Review of PSI report (JBS&G, 2016) and other relevant documentation provided for the site; detailed intrusive site investigations to enable collection and analysis of representative soil samples; analysis of selected soil samples for contaminants of potential concern (COPCs); assessment of environmental data collected, including comparison of field and analytical data against appropriate EPA-made or endorsed investigation / screening levels for the proposed land uses; and, preparation of a DSI report in accordance with EPA guidelines and State Environmental Planning Policy 55 – Remediation of Land (SEPP 55).

Soil sampling was completed at 32 grid-based and targeted locations using hand-augers. The depth of the boreholes ranged from 0.15-0.6 m bgs. Samples were collected of surface materials (0.0-0.1 m bgs), and subsurface materials (0.2-0.3 and 0.4-0.5 mbgs). Selected samples were submitted for analysis for the identified COPCs at a NATA accredited laboratory.

All COPCs were reported within site criteria with the exception of benzo(a)pyrene which exceeded the adopted ecological criteria at one sample location. However, based on NEPC (2013) guidance, the exceedance is not considered to present an unacceptable ecological risk due to the limited potential for plant uptake of this contaminant due to its tendency to bind to soils, and lack of evidence of stressed grass or other vegetation at this location.

Based on the scope of work completed for this assessment and subject to the limitations in **Section 11**, it was concluded that no health risks to future site users or workers have been identified at the site; no ecological risks to ecological receptors were identified at the site; and the site is suitable for the proposed land uses.

1. Introduction

JBS&G Australia Pty Ltd (JBS&G) was engaged by New South Wales Land and Housing Corporation - Department of Family and Community Services (LAHC, the client) for the provision of environmental consulting services associated with the Ivanhoe Estate, located off Herring Road, Macquarie Park, NSW (the site) as shown in **Figures 1** and **2**.

The site is legally identified as Lots 6 to 20 in Deposited Plan (DP) 861433 and Lot 5 in DP 740753, occupying a combined total area of approximately 8 hectares (ha). The site currently comprises 259 social housing dwellings, and the primary land use at the time of the investigation was residential with several supporting local access roads and landscaping/public open space. A child care centre is located in the central portion of the site.

Current land zoning includes B4 – Mixed Use and an area of RE1 – Public Recreation (**Figure 3**). JBS&G understand that the client intends to redevelop the estate in keeping with the mixed land use and public recreation areas.

JBS&G completed a due diligence environmental site assessment, otherwise referred to as a preliminary site investigation (PSI), for the site in April 2016. The PSI identified areas of environmental concern (AEC) (**Figure 4**) relating to historical agricultural/market garden activities, application and storage of herbicides/pesticides and heavy metals, areas of historical filling, creek bed sediments and surficial drainage lines possibly impacted by accumulated contaminants in surface water and sediments, electrical transformers, hazardous building materials associated with existing and former site structures, and accumulation and incineration of waste.

The client requires a DSI to assess the extent of potential contamination prior to development.

This investigation has been developed in accordance with guidelines made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards.

1.1 Objectives

The objectives of the DSI are to characterise potential contamination at the site, to draw conclusions regarding the potential suitability of the site for proposed land uses, and, if required, make recommendations for further investigation and/or management to make the site suitable for the proposed land uses.

1.2 Scope of Works

To achieve the objectives of the DSI, the following work was completed:

- Review of PSI report (JBS&G, 2016) and other relevant documentation provided for the site;
- Detailed intrusive site investigations to enable collection and analysis of representative soil samples;
- Analysis of selected soil samples for heavy metals, polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), herbicides, asbestos, pH, iron, and cation exchange capacity (CEC);
- Assessment of environmental data collected, including comparison of field and analytical data against appropriate EPA-made or endorsed investigation / screening levels for the proposed land use(s); and,
- Preparation of a DSI report in accordance with EPA guidelines and State Environmental Planning Policy 55 – Remediation of Land (SEPP 55).

2. Site Condition and Surrounding Environment

All environmental data has been summarised from PSI (April 2016).

2.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figures 2** and **3**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1 Summary Site Details

Lot/DP	Lots 6-20 in DP 861433 and Lot 5 in DP740753
Address	Ivanhoe Estate, off Herring Road, Macquarie Park, NSW 2113
Local Government Authority	City of Ryde
Approximate MGA Coordinates (MGA 56)	Approximate Coordinates for the corners of the site are provided below and displayed graphically on **Figure 2** 1: E325499 N6260619 2: E325456 N6260570 3: E325484 N6260545 4: E325391 N6260439 5: E325658 N6260199 6: E325674 N6260210 7: E325714 N6260216 8: E625743 N6260245 9: E325746 N6260287 10: E325778 N6260297 11: E325785 N6260323 12: E625785 N6260373
Site Zoning	B4 Mixed Use; RE2 Public Recreation Ryde LEP 2014 (**Figure 3**)
Current Use	Residential/commercial/childcare
Previous Use	Residential/commercial/childcare
Proposed Use	Mixed Use / Public Recreation
Site Area	Approximately 8 ha

2.2 Site Description

Detailed site inspections were conducted by JBS&G's trained and experienced environmental consultants as part of the PSI (JBS&G, 2016) on 14 April 2016, and as part of the DSI on 5-6 September 2016. Observations made during the two site inspections area included in **Sections 2.2.1** and **2.2.2**, below. The site layout is shown in **Figure 2**, land zoning is shown on **Figure 3** and sample locations and AECs are shown in **Figure 4**.

The site encompasses sixteen allotments comprising a generally irregular shaped parcel of land located southeast of Herring Road and to the north of Epping Road. Access to the site was via Ivanhoe Place off Herring Road at the northwest site extent. The southeast, southwest and northwest boundaries of the site were not fenced but were bounded by thick vegetation, bushland and Shrimptons Creek respectively. The northwest site extent was bound by wood paling and metal fences.

2.2.1 PSI Observations

The site comprised a moderately undulating parcel of land sloping towards the southeast, the ground surface of which was largely covered by building footprints and concrete, paving and asphalt hardstands. Historical cut and fill activities undertaken to facilitate the construction of larger developments in the estate were apparent.

The buildings comprised primarily two storey brick and tile townhouses and multistorey apartment blocks. A single storey, standalone child care centre development also existed within the centre of the estate. The buildings were estimated to have been constructed between 1980 and 1990.

No indications of gross or widespread contamination was observed at the site. A number of aesthetic issues were observed which are discussed further in the subsequent sections. No significant chemical storage, underground storage tanks (USTs) or above ground storage tanks (ASTs) were observed on the site. No odours indicative of contamination were noted and no groundwater monitoring wells were observed. An organic odour was noted associated with stagnant water within Shrimptons Creek to the southeast of the site, noting that the creek is beyond the site boundary.

A summary of observed land uses and pertinent site features is provided in the subsequent sections.

Parkland and Reserves: Lots 6, 7, 8, 9, 10 and 11 in DP861433

The southeast section of the site (Lot 9 DP861433) comprised parkland area, bound to the southeast by Shrimptons Creek and an approximately 10 m wide strip of trees and shrubs. The parkland area was generally in good condition, with little to no bare soil and no signs of vegetative stress. The lot contained a disused recreational barbeque area, a skate park and was dissected by a shared path (pedestrian and cyclist). Several fire scars were observed on concrete hardstands and infrequent small collections of rubbish were noted around ground surfaces within the area.

Shrimptons Creek was observed to be stagnant at the time of the inspection. Surface waters consisted of green to brown, mildly turbid waters which emitted an organic odour. Several stormwater outlets contributed to the creek along its alignment which were constructed with gross pollutant traps.

The southwest of the site comprised an allotment (Lot 8 DP861433) which was entirely covered by thick vegetation, which prevented detailed inspection of the site surfaces at the time of the investigation.

Three reserves for pedestrian access existed within the site, joining Herring Road to Ivanhoe Place (within Lot 11 DP861433), Wilcannia Way to Nyngan Way (within Lot 6 DP861433) and Nyngan Way to Narromine Way (within Lot 7 DP861433). The reserves were primarily covered in grass and were observed to grade towards stormwater pits. An electrical transformer situated on a concrete foundation was located on the southern border of Lot 6 DP861433. No staining of the ground surface or odours associated with the transformer were observed.

KU Macquarie Park Child Care Centre and Townhouses: Lot 5 in DP740753 and Lots 14, 15 and 16 in DP861433

A single standalone structure existed within Lot 5 in DP740749, which was utilised as a child care centre at the time of the investigation. Access to the property was not available during the inspection, preventing detailed inspection of the site surfaces and surrounds in this area. The building appeared to be in good condition and did not show any significant signs of deterioration.

Approximately half of the residential land on site comprised townhouse structures with front and backyards. Residential structures appeared to be in a state of good repair, not exhibiting any significant deterioration or paint flaking. No suspected ACM was observed within any of the structures or on any of the surrounding ground surfaces in accessible areas. However, at the time the investigation a detailed inspection of the individual residences, including fences portions of the properties was unable to be undertaken due to access restrictions.

A transformer existed on the northwest boundary of Lot 16 DP861433, situated on a concrete foundation. No staining or odours associated with the transformer were observed. Additionally, an unnatural undulation in topography was observed on the southwest corner of the lot, potentially associated with cut and fill activities required to meet construction requirements during development of the land.

Fly tipping was observed at two locations on the site, assumed to be the result of dumping of residential waste. The tipped materials were general waste and not considered to pose a likely contamination risk.

Multi-storey Apartment Buildings: Lot 12, 13 and 17 DP861433

Multi-storey apartment buildings occupied the remainder of the residential land on site. The buildings were surrounded by both sealed hardstands (paths, driveways, etc.) and areas of grass/landscaping. Significant alteration of the ground surfaces appeared to have taken place during construction, potentially being achieved from the importation of fill materials or utilisation of building and demolition waste mixed with site won soils. Cut/fill activities appear to have been localised to the northern section of Lot 12 DP861433 and Lot 17 DP861433. The buildings appeared to be in good condition and did not show any significant signs of deterioration.

Ivanhoe Place and Local Road Reserves: Lot 18, 19 and 20 DP861433

Three allotments within the estate have been utilised for small access roads comprising Wilcannia Way, Nyngan Way and Narromine Way. The roads were surfaced by a combination of brick pavers, asphalt and concrete hardstands. All hardstands appeared to be in good condition and did not exhibit any significant staining.

2.2.2 DSI Observations

Site conditions were broadly consistent with the observations made in the PSI. One notable exception was the fire scars on concrete surfaces, which appeared to have been removed.

2.3 Surrounding Land use

The current land use of adjacent properties or properties across adjacent roads is summarised below.

- North – the site is bound to the northwest by Herring Road and to the northeast by several medium density housing estates. Within the medium density housing estates lie Elouera Reserve, Quandong Reserve and Wilga Park and recreational parklands. Further north, across Herring Road, are some commercial premises including Trinity Chapel Macquarie and Dunmore Lang College then Kikkiya Creek followed by Macquarie University. To the northeast is the Macquarie Centre, a large commercial and retail development.
- East – immediately east and southwest of the site lies Shrimptons Creek. Further east were several commercial office and retail spaces followed by the Optus Business centre.
- South – the site is bound to the southwest by Epping Road and to the southeast by Shrimptons Creek. The land across Epping Road was observed to comprise standalone residences. Further south were a number of recreational parks and sporting fields comprising the Ryde Community Sports Centre; and
- West – the site is bound to the northwest by Herring Road and to the southwest by Epping Road. Adjacent to the Ivanhoe Estate, across Herring Road, were several commercial premises comprising Morling College and Morling Church as well as a large property redevelopment being undertaken at the time of the investigation. Further west, the land use appeared to be primarily low to medium density residential with recreational parkland interspersed between premises.

Review of current site uses for the surrounding lands did not identify any potential off-site AECs with the potential to cause contamination at the site.

2.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer (LPI 2015[1]) regional topographic map indicated that site has an elevation of approximately 50 m

[1] *Spatial Information Exchange Viewer*, NSW Land and Property Information, accessed 08 February 2016, https://maps.six.nsw.gov.au/

Australian Height Datum (AHD) undulating generally downwards to the southeast. Regional topography sloped down to the northeast.

Site inspection confirmed that the grounds on site generally undulate with overall falls towards Shrimptons Creek beyond the southeast site boundary. Localised variations in ground level were apparent as discussed in the Site Observations section above, associated with cut to fill works for the current development layout.

2.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Sydney (DMR 1983[2]) indicates that the site is underlain by Hawkesbury sandstone of the Wianamatta Group. The geology originated in the Middle Triassic period of the Mesozoic Era. The geology is largely characterised by medium to coarse-grained quartz sandstone, very minor shale and laminate lenses and generally exists within braided alluvial channels.

Reference to the 1:100 000 Soil Landscape Series Sheet for Sydney (DMR 1983[3]) indicates that the site is within the vicinity of two soil landscapes: Glenmore and Lucas Heights.

The Glenorie landscape is characterised by undulating to rolling low hills on Wianamatta Group shales, local relief is generally 50-80 m with slopes of 5-20 %, narrow ridges, hillcrests and valleys. Landscapes are generally extensively cleared tall open rainforest. The soil landscape is characterised by shallow to moderately deep Red Podzolic Soils on crests, moderately deep red and brown Podzolic Soils, deep Yellow Podzolic Soils on lower slopes and Humic Gleys, yellow Podzolic Soils and Gleyed Podzolic Soils along drainage lines. The limitations of the Glenorie comprise high soil erosion hazard, localised impermeable highly plastic subsoil and it is moderately reactive.

The Lucas Heights landscape is characterised by undulating to crests and ridges on plateau surfaces of the Mittagong Formation, local relief is generally 30 m with slopes of less than 10 % and an absence of rock outcrops. Landscapes are generally extensively or completely cleared dry low forest and woodland. The soil landscape is characterised by moderately deep hard setting Yellow Podzolic Soils and Yellow Soloths, and Yellow Earths on the outer edges of crests. The limitations of Lucas Heights soils comprise stony soil, low soil fertility and low available water capacity.

The site appeared to have been subject to previous cut and fill activities to facilitate the installation of site structures or create existing ground surface levels. The detailed site inspection has identified the potential for backfill to be used in the vicinity of larger site structures and within the footprint of apartment complexes.

2.6 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map for Prospect/Parramatta[4] indicates that the subject site is located within an area of 'no known occurrence of Acid Sulfate Soils'. Acid sulfate soils (ASS) are not known or expected to occur in areas having this classification.

Review of council documentation indicated that the site is not affected by a policy adopted by council or any other public authority notified to council restricting development of the land due to ASS.

On this basis, no further consideration of the potential risks associated with disturbance of acid sulfate soil are required and no acid sulfate soil management plan would be required prior to future development works.

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2 *Sydney 1:100 000 Geological Series Sheet 9130 (Edition 1).* Department of Mineral Resources, 1983 (DMR 1983)

3 *Sydney 1:100 000 Geological Series Sheet 9130 (Edition 1).* Department of Mineral Resources, 1983 (DMR 1983)

4 *'Acid Sulfate Soil Risk Map – Prospect/Parramatta, Edition 2'*, 1997 1:25 000 Ref: 9130N3. (NSW DLWC)

2.7 Hydrology

As discussed above, the site is bound to the east by Shrimptons Creek with a generally northeast to southwest alignment. Stagnant water was observed within the drainage channel. The creek continues northeast beyond the site extent before discharging into Lane Cove River located approximately 1.3 km northeast of the site. Lane Cove River eventually discharges into Parramatta River 8.6 km southeast of the site.

Shrimptons Creek has an urban catchment area which is known to be subject to localised flooding impacts in significant rainfall events (Ryde 2012[5]). Water quality is understood to have been impacted by urbanisation of the area; the creek is characterised by discolouration, turbidity, and aquatic weeds and odours. Increased densification of the urban environment surrounding Shrimptons Creek has resulted in localised flooding during heavy rainfall periods (Ryde 2012).

As discussed in **Section 2.2**, the site is largely surfaced with hardstand concrete or asphalt paving or covered by building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system via stormwater pits and road reserve catch points and then discharge into Shrimptons Creek. Surface soil infiltration is anticipated to be relatively low and would occur at a rate a rate reflective to the site's geology / lithology (**Section 2.5**).

2.8 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools (NSW DPI 2016[6]). A review of the registered bore information indicated that there were four bores within a 1.5 km radius of the site. The registered bore searches are summarised in **Table 2.2**.

Table 2.2 Registered Groundwater Bore Search

Bore ID	Use	Property	Standing Water Level (m bgs)	Well Depth (m)	Approximate Distance / Direction from Site
GW011296	Irrigation	N/A	4.50	67.00	800 m / North
GW016863	Irrigation	N/A	6.00	45.70	800 m / North
GW108110	Test Bore	Curzon Hall	7.30	81.00	1200 m / West
GW109610	Monitoring Bore	Macquarie Uni Station Site 43	-	-	1150 m / East
GW109611	Monitoring Bore	Macquarie Uni Station Site 43	-	-	1150 m / East
GW109612	Monitoring Bore	Macquarie Uni Station Site 43	-	-	1150 m / East
GW109613	Monitoring Bore	Macquarie Uni Station Site 43	-	-	1150 m / East
GW109694	Monitoring Bore	Macquarie Uni Station Site 43	-	-	700 m / North
GW109695	Monitoring Bore	Macquarie Uni Station Site 43	-	-	700 m / North
GW109696	Monitoring Bore	Macquarie Uni Station Site 43	-	-	700 m / North
GW109837	Monitoring Bore	Parramatta Rail Link Intersection at Lane Cove Rd & Waterloo Rd	-	36.60	1150 m / East
GW110169	Monitoring Bore	43 Waterloo Rd	-	6.50	1150 m / East
GW110170	Monitoring Bore	43 Waterloo Rd	-	43.00	1150 m / East
GW110171	Monitoring Bore	43 Waterloo Rd	-	36.10	1150 m / East

[5] *'Shrimptons Creek Parklands Plan of Management'*, City of Ryde, 13 November 2012, (Ryde 2012)

[6] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 08 February 2016.

Bore ID	Use	Property	Standing Water Level (m bgs)	Well Depth (m)	Approximate Distance / Direction from Site
GW110172	Monitoring Bore	43 Waterloo Rd	-	36.00	1150 m / East
GW112640	Monitoring Bore	Woolworths Petrol Division	-	8.00	850 m / Northwest
GW112641	Monitoring Bore	Woolworths Petrol Division	-	8.00	850 m / Northwest
GW112642	Monitoring Bore	Woolworths Petrol Division	-	8.00	850 / Northwest

Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in an easterly direction, towards the Shrimptons Creek located along the south-eastern site boundary. Groundwater is expected to be encountered in fluvial sediments, as perched groundwater, and more permeable horizons within the bedrock.

Registered groundwater bores located within a 1.5 km radius of the site are used for a monitoring purposes; historical irrigation licences were all expired at the time of the investigation. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is considered to be a moderate probability of additional undocumented monitoring/irrigation bores in the vicinity of the site.

2.9 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Riverview[7]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 6.4^{o}C in July to 17.7^{o}C in January;
- Average maximum temperatures vary from 16.8^{o}C in July to 26.7^{o}C in January;
- The average annual rainfall is approximately 1129.9 mm with rainfall greater than 1 mm occurring on an average of 98 days per year; and
- Monthly rainfall varies from 61.6 mm in September to 126.7 mm in March with the wettest periods occurring on average in January to June.

[7] http://www.bom.gov.au/climate/averages/tables/cw_066131.shtml. Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 6 April 2016 and accessed by JBS&G on 6 April 2016

3. Previous Investigations

JBS&G was engaged by the client to complete a PSI at the property. The investigation included a desktop review of site conditions and historical land use, as well as a detailed site inspection.

The desktop historical review identified the site has been used for market gardening, with a small number of historical structures, up until development of the site for its current land use as government housing.

Areas of environmental concern (AECs) were identified at the site relating to historical agricultural/market garden activities, application and storage of herbicides/pesticides and heavy metals, areas of historical filling, creek bed sediments and surficial drainage lines possibly impacted by accumulated contaminants in surface water and sediments, electrical transformers, hazardous building materials associated with existing and former site structures, and accumulation and incineration of waste.

The report concluded that no gross or widespread contamination indicators were apparent during the site inspection which may prevent the site from being made suitable for potential redevelopment.

A DSI was recommended for the site, including soil, surface water and groundwater sampling targeting AECs and contaminants of potential concern (COPC). Additionally, hazardous building material audits were recommended for existing structures proposed for demolition.

4. Conceptual Site Model

The National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1) (NEPC 2013) identifies a conceptual site model (CSM) as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, vapours etc.);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

Based on the desktop review and observations from the site inspection outlined in the PSI, the following conceptual site model (CSM) has been developed for the site.

4.1 Potential Areas of Environmental Concern

Based on the findings of the PSI for the site (JBS&G, 2016) and subsequent review current AECs are presented in **Table 4.1**.

Not all AECs identified in the PSI (JBS&G, 2012) were investigated. Shrimptons Creek was identified as an AEC but is not within the site boundaries and therefore is not within the scope of the current investigation. Additionally, review of aerial photos confirmed the transformers identified were constructed between 1982 and 1991 and are therefore highly unlikely to contain PCBs, the principal COPC associated with transformers. Further, fly tipping and potential burning of waste identified at the site appear to have only occurred at a small scale and involving general household waste.

Table 4.1: Areas of Environmental Concern and Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Concern (COC)
Fill materials of unknown origin observed to be present as a result of site development activities.	Heavy metals, polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRH) / benzene, toluene, ethylbenzene and xylenes (BTEX), organochlorine pesticides (OCPs) / polychlorinated biphenyls (PCB) and asbestos.
Hazardous building materials associated with existing / former site structures.	Asbestos, PCBs and lead.
Former agricultural/market garden site activities.	OCPs, organophosphorus pesticides (OPPs) and heavy metals.

4.2 Potentially Contaminated Media

The AECs and corresponding COPCs identified in **Table 4.1** have the potential to result in impact to soil and groundwater underlying the site (with the exception of asbestos). Contaminants including TRH and BTEX as associated with a number of AECs also have the potential, where soil and/or groundwater impact occurs to result in soil vapour impacts.

Where COPCs are detected, it is anticipated the greatest level of impact will be to surface or shallow soils. This is a consequence of the likelihood of surface application being the source of impact, generally comprising solids (waste, ash, asbestos, etc.) or liquids (fuels, pesticides/herbicides, lubricants, etc.). If impact is found in surface soils, it may be found to have leached and migrated deeper into the soil profile.

Where fill materials are present, soils have been disturbed, or waste material buried, there is a potential that environmental impact may also be present at depth, consistent with the depth of the disturbance. Anthropogenic materials are commonly present in impacted fill materials and can be used as an indication of the depth of disturbance. Where fill materials impacted with chemical contaminants are identified, there is potential for the contaminants to migrate laterally and vertically below the fill material via leaching.

Natural soils at depth and bedrock at the site are not considered likely to have been impacted by site activities given that the PSI did not identify indications of significant contaminating activities (fuel/oil storage, industrial activities, etc.). Given the anticipated limited extent of contamination impact depth below current ground levels and the absence of indicators of natural soil/rock impact, the potential for impacts to groundwater directly related to use of the site is considered to be low.

4.3 Potential Exposure Pathways

Potential human receptors at the site include current residents, visitors and construction or maintenance contractors engaged to work at the site, who may potentially be exposed to COPCs through inhalation of soil vapour, or direct contact with impacted soils.

Potential pathways in the future may include:

- Potential dermal contact with and ingestion of impacted soils / groundwater as present at shallow depths and/or accessible by future excavations by site workers and/or occupants; and/or
- Potential Inhalation of vapours migrating upwards and laterally from fill and/or natural soil.

The site is largely surfaced with hardstand pavements and building footprints. Onsite ecological receptors are therefore limited to grassed areas, garden beds and other vegetated areas. The primary off-site ecological receptor is Shrimptons Creek, although migration via groundwater is considered unlikely given the lack of any significant contaminating activities.

4.4 Potential for Migration

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

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

The potential contaminants of concern identified as part of the site history review and site inspection are generally in solid (e.g. asbestos and metals) and/or liquid (e.g. TPH, PAH, BTEX, OCPs, OPPs and PCBs) form.

The ground surfaces surrounding AECs are a mixture of grassed/vegetated portions of land exposed to atmospheric conditions such as wind and rain, and hardstand pavements. As such, there is limited potential for contaminants to migrate from the site via windblown dust. There is potential for rainwater infiltration through vegetated areas to migrate into groundwater, however this is considered unlikely given the lack of significant contaminating activities and anticipated depth to groundwater. Given the presence of either vegetated or sealed surfaces, there is limited potential for contaminants in soil to migrate via overground flow into municipal stormwater.

4.5 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gasses.

Man-made preferential pathways are likely present throughout the site, generally associated with areas of previously disturbed fill material, alluvial soil channels, fill materials present beneath existing ground surface, and at near surface depths over the remainder of the site. Fill materials, including those surrounding subsurface infrastructure, disturbed natural soil and alluvial (as opposed to residual) soils, are anticipated to have a higher permeability than the underlying natural soil and/or bedrock.

5. Sampling Analysis and Quality Plan

5.1 Data Quality Objectives

Data Quality Objectives (DQOs) have been developed to facilitate the design of the site assessments, as discussed in the following sections.

5.1.1 State the Problem

A PSI (JBS&G, 2016) previously completed for the Ivanhoe Estate identified potential soil contamination relating to fill material, hazardous building materials, and agricultural/market garden activities.

5.1.2 Identify the Decision

To meet the specific project objectives, the following decisions must be made:

- Are there any additional unacceptable risks to future site users or the environment from soil contamination?
- Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?
- Are there any impacts of chemical mixtures?
- Are there any odours or aesthetic issues?
- Is there any evidence of, or potential for, migration of contaminants from the site?
- Is a site management strategy required?

5.1.3 Identify the Inputs to the Decision

Inputs to the decision are:

- Identified areas of concern and contaminants of potential concern at the site;
- Previous site contamination information including physical observations;
- Soil environmental data consisting of assessment for identified COPC in soil;
- Development of appropriate assessment criteria for evaluation of soil impacts;
- Assessment criteria to be achieved on the site as based on the intended land use and project objectives, as defined by assessment criteria nominated in **Section 6**;
- Confirmation that data generated by sampling and analysis are of an acceptable quality to allow reliable comparison to assessment criteria as undertaken by assessment of quality assurance / quality control (QA/QC) as per the data quality indicators (DQIs) established in **Section 5.2**.

5.1.4 Define the Study Boundaries

For the purposes of the proposed investigation the boundaries of the study area are defined by the site boundaries as listed in **Table 2.1**, which includes Lots 6-20 in DP 861433 and Lot 5 in DP740753. The site boundary and site layout is shown in **Figure 2**. The vertical depth of the investigation extended to 0.15-0.6 m bgs, the depth of hand-augers at the site.

Due to the project objectives, seasonality was not assessed as part of this investigation. Data will therefore be representative of the timing and duration of the current investigation.

5.1.5 Develop a Decision Rule

The decision rules adopted to answer the decisions identified in **Section 5.1.2** are summarised in **Table 6.1**.

Table 5.1 Summary of Decision Rules

Decision Required to be made	Decision Rule
1. Are there any unacceptable health risks to onsite future receptors?	Soil and groundwater analytical data were compared against adopted EPA endorsed criteria. Statistical analyses in accordance with relevant guidance documents were undertaken, if appropriate, to facilitate the decisions. The following statistical criteria were adopted with respect to soils: Either: the reported concentrations were all below the site criteria; Or: the average site concentration for each analyte was below the adopted site criterion; no single analyte concentration exceeded 250% of the adopted site criterion; and the standard deviation of the results was less than 50% of the site criteria. And: the 95% upper confidence limit (UCL) of the average concentration for each analyte was below the adopted site criterion. Were contaminants present at concentrations exceeding the published groundwater guidelines? If the statistical criteria stated above were satisfied, the decision
2. Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?	If the 95% UCL of surface soils exceed published background concentrations (NEPC 1999), the decision was Yes. Otherwise, the decision was No.
3. Are there any impacts of chemical mixtures?	Were there more than one group of contaminants present which increase the risk of harm? If there was, the decision was Yes. Otherwise, the decision was No.
4. Are there any soil staining, odours or aesthetic issues?	If there were any ACM fragments on the ground surface, any unacceptable odours or soil discolouration, the decision was Yes. Otherwise, the decision was No.
5. Is there evidence of, or potential for, migration of contaminants from the site?	Consideration will be given to whether there are any elevated contaminant concentrations in soil or groundwater in proximity to or at site boundaries and where site conditions may lead to the potential to migrate off site. If yes, the decision was Yes. Otherwise, the decision was No.
6. Is a site management strategy required?	Was the answer to any of the above decisions YES? If yes, a site management strategy is required. If no, a site management strategy is not required.

Statistical analyses of the data will be undertaken, if required, in accordance with relevant guidance documents. The following statistical criteria shall be adopted:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte concentration shall exceed 250% of the adopted criterion; and
- The standard deviation of the results must be less than 50% of the criterion.

5.1.6 Specify Limits of Decision Error

This step establishes the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NEPC (2013), ANZECC/ARMCANZ (2000), DEC (2007), appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

5.2 Quality Assurance / Quality Control

An assessment of quality assurance / quality control (QA/QC) shall be undertaken by calculation of data quality indicators (DQIs).

To assess the usability of the data prior to making decisions, the data is to be assessed against pre-determined DQIs established for the pilot trial as discussed below in relation to precision, accuracy, representativeness, comparability and completeness and sensitivity (PARCCS parameters), and are shown in **Table 5.2**.

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD)[8] of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 5.2: Summary of Quality Assurance / Quality Control Program

Data Quality Indicator	Frequency	Performance Target(s)
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<30% RPD[1]
Split duplicates (inter laboratory)	1 / 20 samples	<30% RPD[1]
Laboratory duplicates	1 / 20 samples	<30% RPD[1]
Accuracy		
Surrogate spike (organic analytes)	All samples	70-130%
Matrix spikes	1 per lab batch or 20 samples	70-130%
Laboratory control samples	1 per lab batch or 20 samples	70-130%

[8] $$RPD\,(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where C0 is the analyte concentration of the original sample
Cd is the analyte concentration of the duplicate sample

Data Quality Indicator	Frequency	Performance Target(s)
Trip spikes (for volatiles)	1 per sampling event	70-130%
Trip blank	1 per sampling event	70-130%
Representativeness		
Sampling appropriate for media and analytes		-
Laboratory blanks	1 per lab batch	<LOR
Samples extracted and analysed within holding times.	-	Organics – 14 days Inorganics – 6 months
Comparability		
Standard operating procedures for sample collection & handling	All samples	All samples
Standard analytical methods used for all analyses	All samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All samples	All samples
Completeness		
Soil description and COCs complete and appropriate	All samples	All samples
Appropriate documentation	All samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitiveness		
Limits of reporting appropriate and consistent	All samples	All samples

1. If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

5.3 Optimise the Design for Obtaining Data

Various strategies for developing a statistically based sampling plan are identified in EPA (1995), including judgemental, random, systematic and stratified sampling patterns. The guidelines however do not include recommendations for minimum sampling densities on sites greater than 5 ha. For these sites, the guidelines recommend dividing the site into areas to enable a combination of systematic and targeted sampling based on historical land use and potentially contaminating activities, and identified AECs. Based on the limited evidence of historical contaminating activities at the site, it was not considered necessary to divide the site into smaller areas. A combination of systematic and targeted sampling was considered appropriate for the whole site area. Systematic sampling was therefore completed at 26 grid base hand-auger locations, with selected sample locations skewed to target the identified AECs at the site.

5.3.1 Soil Sampling Methodology

Hand tools (150mm hand auger) were used to collect soil samples from depths between 0.0 to 0.60 m below ground surface (bgs), including surface samples (0.0-0.1 m bgs), subsurface samples (0.20-0.30 m bgs) and deeper samples (0.40-0.50 m bgs). During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted.

Collected samples were immediately transferred to laboratory supplied sample jars and 500g zip-locked bags. The samples were then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory. Based upon field observations, samples were analysed in accordance with the laboratory schedule (**Table 5.3**).

Not all samples collected were analysed. All samples will remain at the primary laboratory for a period of two months for possible future analysis (subject to holding times) if required following the receipt of sample results

Prior to the commencement of sampling activities, any non-disposable sampling equipment, including sampling shovel and hand-auger was cleaned with a water/detergent spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no soil, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works.

Sampling equipment was subsequently decontaminated using the above process between each sampling location.

5.4 Laboratory Analysis

JBS&G contracted Eurofins | MGT (Eurofins) as the primary laboratory for all of the required analyses. Eurofins were also contracted for analysis of inter-laboratory duplicate samples. Envirolab Services (Envirolab) was contracted for analysis of intra-laboratory triplicate samples. Both Eurofins and Envirolab are NATA accredited for the required analyses.

A Trip spike/blank and rinsate sample accompanied the samples. In addition, the laboratories were required to meet JBS&G's internal QA/QC requirements. Laboratory analysis of samples were conducted as summarised in **Table 5.3**.

Table 5.3 Proposed Sampling and Analytical Program

Area	Sample Type	No. of Sampling Locations	Analyses (exc. QA/QC)
Mixed Use Area	Soil (Bag and Jar)	29 Sampling Locations (HA01-HA29)	Heavy metals – 34 samples PAHs - 30 samples Asbestos – 30 samples TRH/BTEX – 12 samples PCBs – 19 samples OCPs – 19 samples Herbicides – 7 samples OC, CEC, Fe, pH, – 2 samples ASLP/TCLP (metals) – 1 sample TRHs with Silica Gel Clean-up – 1 sample
Public Recreation Area	Soil (Bag and Jar)	3 Sampling Locations (HA30 – HA32)	Heavy metals – 6 samples PAHs - 2 samples Asbestos – 2 samples TRH/BTEX – 2 samples PCBs – 1 samples OCPs – 1 samples Herbicides – 1 samples TRHs with Silica Gel Clean-up – 1 sample

6. Assessment Criteria

6.1 Regulatory Guidelines

The investigation was undertaken with consideration to aspects of the following guidelines, as relevant:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended 2013, National Environment Protection Council (NEPC 2013);
- *Contaminated Sites: Sampling Design Guidelines.* NSW EPA, 1995 (EPA 1995);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* NSW OEH, 2011 (OEH 2011);
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition.* NSW EPA, 2006 (DEC 2006); and
- *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009*. Western Australia Department of Health 2009 (DOH 2009)

6.2 Soil Criteria

Soil criteria were selected based on the zoning of the land as B4 Mixed Use and RE1 Public Recreation, and the potential for redevelopment of the site to include high density housing, commercial premises, and child care facilities.

Correspondence with the client indicates that if the site is redeveloped, the primary land use is likely to be high density residential, with an area at the east of the site used for public recreation. As such, concentrations of contaminants in soil will be compared primarily against NEPC (2013) published levels sourced from the National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM) as follows:

- Health based investigation/screening levels for residential land use with minimal opportunities for soil access (HIL/HSL-B);
- Health based investigation/screening levels for developed open space or recreational areas (HIL/HSL-C);
- Ecological screening levels for urban/residential land use (coarse soil) (ESLs); and
- Ecological investigation levels for urban/residential land use (EILs).

Commercial premises have also been identified as a potential future land use at the site. As such secondary NEPC (2013) ASC NEPM criteria adopted for the site are as follows;

- Health based investigation/screening levels for commercial/industrial land use (HIL/HSL-D);
- ESLs for commercial/industrial land use (coarse soil);

Additionally, there is potential for redevelopment of the site to include a child care centre. As such, tertiary criteria for the site are:

- Health based investigation/screening levels for low density residential land use (includes child care centres) (HIL/HSL-A);

Consideration will also be given to aesthetic impacts, consistent with DEC 2006 and NEPC 2013 guidance.

Site derived EILs were calculated based on pH, CEC and TOC data for three soil samples at the site, as detailed below:

- CEC 12 meq/100g, pH 5.6 and TOC 2.5 mg/kg in HA03 (0.0-0.1);
- CEC 11 meq/100g, pH 6.3 and TOC 2.3 mg/kg in QC20160906-01 (duplicate of HA03_0.0-0.1); and
- CEC 10 meq/100g, pH 8.5 and TOC 2.9 mg/kg in HA27 (0.0-0.1).

EIL calculations are included as **Appendix D**.

7. Quality Assurance/Quality Control

7.1 QA/QC Results

The QA/QC result for soil and surface water samples collected at the site are summarised in **Table 7.1** and discussed in **Section 7.2**. Detailed QA/QC results are included in the laboratory reports in **Appendix E**, and in the Quality Assurance/Control in **Appendix G.**

Table 7.1 QA/QC Results Summary

Data Quality Indicator	Results	DQI met?
Precision		
Blind duplicates (intra laboratory)	0-149% RPD Intra laboratory samples were analysed at a rate of 1 in 20 samples or greater for project	Partial[1]
Blind triplicates (inter laboratory)	0-151% RPD – Not applicable Intra laboratory samples were analysed at a rate of 1 in 20 samples or greater for project	Partial[1]
Soil Laboratory duplicates	<1-31% RPD	Partial[1]
Accuracy		
Surrogate spikes	67-141% Recovery Surrogate spikes were completed for all organic samples	Partial[1]
Laboratory Control Samples	75-127% Recovery Laboratory control samples were completed for all organic and metals samples	Yes
Matrix spikes	70- 130% Recovery Matrix spikes were completed for all organic and metals samples	Yes
Representativeness		
Sampling appropriate for media and analytes	All sampling conducted in accordance with JBS&G procedures	Yes
Laboratory blanks	<LOR	Yes
Samples extracted and analysed within holding times.	All samples were extracted and analysed within holding times.	Yes
Trip spike	72-91% Trip spikes were analysed at rate of 1 per primary laboratory batch.	Yes
Trip blank	<LOR Trip blanks were analysed at rate of 1 per primary laboratory batch.	Yes
Rinsate blank	Nil	Partially[1]
Comparability		
Standard operating procedures used for sample collection & handling	Two trained JBS&G field scientists used standard operating procedures throughout works	Yes
Standard analytical methods used	Standard analytical methods used as listed in **Table 6.1.**	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by two field staff member using standard operating procedures in the same conditions throughout the works. The laboratories remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate.	Yes
Completeness		
Soil description & COCs completed	All field logs and COCs were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation processes were undertaken. Borehole logs and Calibration/ Decontamination records are included as **Appendix H**.	Yes
Satisfactory frequency/result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes
Data from critical samples is considered valid	Data from critical samples is considered valid.	Yes
Sensitivity		

Data Quality Indicator	Results	DQI met?
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Yes

1. See discussion of DQI exceedances in **Section 7.2**.

7.2 QA/QC Discussion

7.2.1 Precision

The intra-laboratory duplicate and inter-laboratory triplicate samples were analysed at a rate 2 in 54 primary samples, slightly below the required rate of 1 in 20 primary samples. It is additionally noted that one of the inter-laboratory duplicate samples (QC20160906-01/A) was not analysed for the same suite of contaminants as the corresponding primary sample HA03 (0.0-0.1). As a result RPDs are not available for all analytes completed for the primary sample.

Results of analysis for the intra-laboratory duplicate and inter-laboratory triplicate analysis were generally within the acceptance criteria of 0-30% RPD with the exception of some heavy metals and PAHs in the primary and inter- and intra-laboratory duplicate pairs.

The discrepancies between the primary samples and intra- and inter-laboratory concentrations are attributed to the reported concentrations being close to the limit of reporting (LOR) and/or the soil heterogeneity. Based on this, the RPD exceedances are not considered to significantly affect the overall data quality of the investigation. However, in the analysis of soil data, the highest reported concentrations were used.

Laboratory duplicate samples were analysed by the testing laboratory at a rate of greater than 1 per 20 primary samples. The results of analysis for laboratory duplicate groundwater samples were marginally outside of the JBS&G performance targets (0-30%), but within the laboratory acceptance criteria.

7.2.2 Accuracy

Surrogate Spike samples analysed had recoveries of 67-141%, outside of the JBS&G acceptable range (70-130%), but within the laboratory acceptance criteria (50-150%)

Laboratory control samples analysed had recoveries of 75-127%, within the JBS&G performance targets (70-130%).

Matrix Spike samples analysed had recoveries of 70-130%, within the JBS&G performance targets (70-130%).

7.2.3 Representativeness

All soil sampling works completed during the investigation were conducted in accordance with JBS&G standard operating procedures.

The extraction and analysis of selected soil samples was completed within the recommended holding times for all analytes.

Rinsate samples were collected as part of the investigation at a rate of 1 per sampling event. Reported concentrations of contaminants within the rinsate samples were below laboratory LOR with the exception of low concentrations of copper (0.001 mg/L), nickel (0.001 mg/L) and zinc (0.006 mg/L). However, these heavy metals were within site criteria for all samples, and therefore the minor concentrations detected are not considered to affect the usability of the data. Contaminants which exceeded site criteria were not detected above the laboratory LOR within rinsate samples.

A trip spike was submitted with the samples with recoveries within the acceptable limits of 70-130%.

A storage blank (trip blank) was submitted with the sample batch. There were no reported concentrations of BTEX compounds above the laboratory LOR.

All laboratory blanks analysed reported analyte concentrations less than the laboratory LOR.

Collected samples were immediately placed into the sample containers, sealed and then placed into chilled eskies to minimise volatile loss.

7.2.4 Comparability

Eurofins|mgt, the primary laboratory, and Envirolab Services, the secondary laboratory, are NATA accredited for all analytical methods used. The laboratories used similar analytical methods and the analytical data were comparable between laboratories as indicated by the results of duplicate analysis. Where different LORs were adopted by the laboratories, this did not impact upon the usability of the data given that all values were considerably less than the adopted assessment criteria.

The samples collected for assessment purposes are considered comparable as all samples were collected by experienced JBS&G field scientists in accordance with standard JBS&G sampling methods.

7.2.5 Completeness

All laboratory and field documentation is complete and correct. Chain of custody documentation is provided with laboratory reports in **Appendix E**.

7.2.6 Sensitivity

The adopted soil analytical methods provided suitable LORs with respect to the adopted site assessment criteria.

7.2.7 QA/QC Conclusions

The field sampling and handling procedures across the site produced QA/QC results which indicate that soil data collected are of an acceptable quality.

The NATA certified laboratory reports indicate that the project laboratories were achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil data is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

8. Results

8.1 Soil Observations

Soil sampling was conducted between 5-6 September 2016 at 26 locations, as shown on **Figure 4**. The ground surface at the site comprised asphalt paved roads, grassed open space, and densely vegetated areas. Borehole logs are included as **Appendix C**.

Soil at the site included brown, silty, sand topsoil, with organic matter, typically up to 0.1 m deep. Natural materials included orange-brown, gravelly, clayey sand, with sandstone gravels; and orange-brown, gravelly sandy clay with sandstone gravels. Hand auger locations were frequently terminated on sandstone cobbles, boulders and bed-rock. No staining, odours or visibly stressed vegetation were observed in the areas of site inspected. No visible asbestos containing material (ACM) was noted on or in soil samples at the locations investigated.

8.2 Soil Analytical Results

Detailed laboratory reports and chain of custody documentation is provided in **Appendix E**. Soil analytical data are presented in **Table A** and are summarised in the following sections.

8.2.1 Metals and Metalloids

Concentrations of metals and metalloids were reported below the adopted human health and ecological criteria in all samples selected for analysis.

8.2.2 TRHs/BTEX

Concentrations of TRH (without silica-gel clean-up) exceeded the adopted ecological criteria for urban, residential and public open space land use in the following samples:

- 440 mg/kg of >C16-C34 Fraction in HA15_0.0-0.1; and
- 540 mg/kg of >C16-C34 Fraction in HA32_0.0-0.05.

TRH and BTEX concentrations were reported below the adopted human health and ecological criteria in all remaining samples selected for analysis.

Statistical analysis was completed for >C16-C34 Fraction TRH results as per **Section 5.1.5**, with outputs shown in **Appendix F**. The 95% upper confidence limit for >C16-C34 Fraction TRHs was 293.2 mg/kg, within the adopted ecological criteria.

Re-analysis of these two samples for TRH with silica-gel clean-up provided results below the LOR in each sample, indicating the TRH initially reported (no silica-gel clean-up) was associated with natural organic material in the soil profile, rather than any petroleum-based contaminants.

8.2.3 PAHs

PAH concentrations exceeded the site criteria in the following samples:

- 2.5 mg/kg of benzo(a)pyrene (B(a)P) in HA20_0.0-0.1, exceeding the adopted ecological criteria for urban, residential and public open space (0.7 mg/kg), and commercial industrial land use (1.4 mg/kg).
- 5.864 mg/kg of Carcinogenic PAHs as B(a)P toxicity equivalent quotient (TEQ) in HA15_0.0-0.1, exceeding the adopted health based criteria for Residential A (3 mg/kg) and Residential B (4 mg/kg) land use scenarios.

PAH concentrations were reported below the adopted human health and ecological criteria in all remaining samples selected for analysis.

Statistical analysis was completed for Carcinogenic PAHs as B(a)P TEQ and benzo(a)pyrene as per **Section 5.1.5**, with outputs shown in **Appendix F**. The 95% UCL for Carcinogenic PAHs as B(a)P TEQ

was 2.484 mg/kg, and the 95% UCL for benzo(a)pyrene was 0.446 mg/kg, both within the adopted human health and ecological criteria.

8.2.4 OCPs/PCBs

Concentrations of OCPs and PCBs were reported below the adopted ecological and human health criteria in all soil samples selected for analysis.

8.2.5 Herbicides (phenoxy-acid)

Concentrations of herbicides were reported below the adopted ecological and human health criteria in all soil samples selected for analysis.

8.2.6 Asbestos

No asbestos was detected in any of the samples submitted for analysis.

9. Site Characterisation

Based on the decisions required to characterise the site, as listed in **Section 5.1.2**, and the decision rules detailed in **Table 5.1**, the following assessment has been made.

9.1 Potential Risks to Future Onsite Receptors

All contaminants concentrations, or 95% UCLs were within the adopted health based criteria for all land use scenarios at the site, therefore no health risks to future site users or workers have been identified at the site.

Ecological criteria for the PAH benzo(a)pyrene were exceeded at one sample location, with regards to, all potential land uses. However, this exceedance is considered unlikely to present a significant ecological risk at the site as plant uptake of benzo(a)pyrene is typically very low. Plants grown on PAH contaminated soil have only limited ability to take in and incorporate anthropogenic PAHs through their root system into their overall biomass, especially PAHs with higher molecular weights including benzo(a)pyrene (CCME 20109). Physical and biochemical processes within soil and the soil ecosystem, in conjunction with the low solubility of benzo(a)pyrene, generally result in benzo(a)pyrene bonding firmly to soil particles or the outside layer of root tissue with root uptake being very slow or not occurring. Based on the above, it is considered that there is no unacceptable risk to plant growth (on-site receptor) from elevated concentrations of benzo(a)pyrene at the sample location. Further evidence is provided by the apparent lack of stressed grass and other vegetation at this location.

It is noted that the 95% UCL for Benzo(a)pyrene is below the criteria for Commercial and Industrial land use.

Based on the analytical results and the discussion above, no risks to onsite ecological receptors have been identified at the site.

9.2 Background soil concentrations

Background samples were not collected as part of the current investigation. However, the concentrations reported in the soil samples collected from natural soils are generally representative of background conditions reported in NEPC (1999).

9.3 Chemical Mixtures

There were no potential chemical mixtures identified during the investigation that may pose management issue at the site.

9.4 Aesthetic Issues

No staining, odours or ACM were observed at site. The fire scars observed on concrete surfaces during the initial JBS&G inspection were noted to have been removed. Areas of fly tipping were observed at the site, however these typically comprised small quantities of domestic items. No significant aesthetic issues were identified at the site.

9.5 Potential Migration of Contaminants

No unacceptable human health or ecological risks were identified associated with soils at the site. Contaminant concentrations in soil were generally low-level and not representative of gross or widespread contamination that would pose a risk of migration to groundwater or via surface water run-off. Given the geological setting and anticipated depth to groundwater, and lack of significant contamination, there is little potential for contaminant migration to and via groundwater. The

[9] *Canadian Soil Quality Guidelines for Carcinogenic and Other Polycyclic Aromatic Hydrocarbons*, (Environmental and Human Health Effects), Canadian Council of Ministers of the Environment (CCME 2010).

presence of sealed or vegetated surfaces restricts the potential for migration of contaminants via windblown dust or surface water.

9.6 Site Management Strategy

Based on the results of the current investigation, no health or ecological risks are present at the site and further investigation or a site management strategy for contamination is not required to enable the intended uses of the site.

10. Conclusions

Based on the scope of work completed for this assessment and subject to the limitations in **Section 11**, it is concluded that the site is suitable for the proposed land uses.

11. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

12. References

NEPC, 2013. *National Environment Protection (Assessment of Site Contamination) Measure 1999* as amended 2013, National Environment Protection Council

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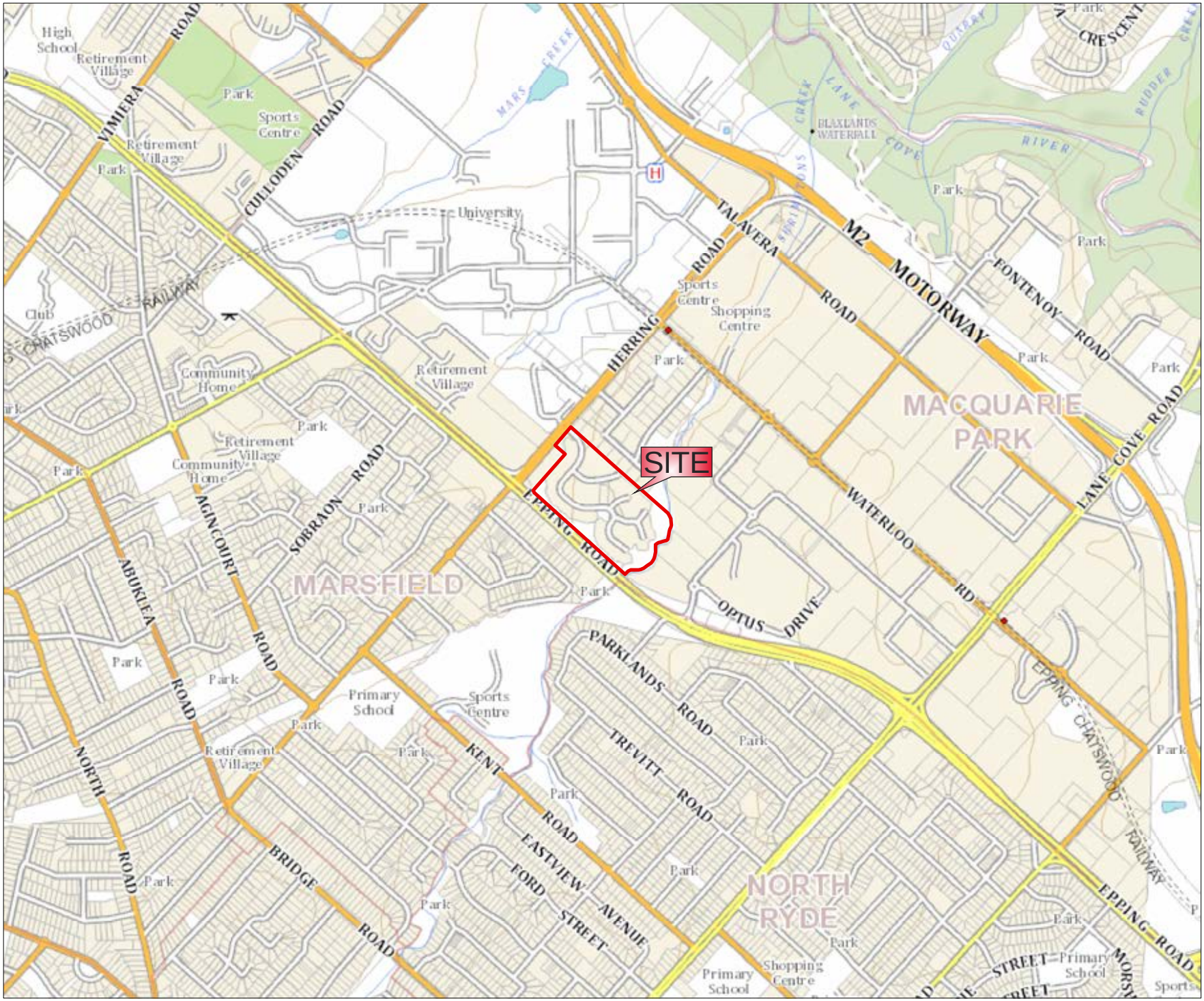
Western Australia Department of Health 2009 (DOH 2009). *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia,* May 2009.

Figures



Legend:
Approximate Site Boundary

JBS&G

Job No: 52047

Client: NSW Land & Housing Corporation

Version: R01 Rev A | Date: 26-Sep-2016

Drawn By: SE | Checked By: LB

Scale 1:15,000

0 200 400
metres

Coor. Sys. GDA 1994 MGA Zone 56

Ivanhoe Estate,
Located Off Herring Road,
Macquarie Park, NSW

SITE LOCATION

FIGURE 1:

File Name: 52047_01
Reference: https://maps.six.nsw.gov.au/ accessed 06/04/2016

No.	Easting	Northing
1	325499.227	6260619.313
2	325455.901	6260570.047
3	325483.685	6260545.329
4	325391.209	6260439.271
5	325658.966	6260199.334
6	325674.166	6260210.493
7	325713.815	6260216.164
8	325743.096	6260245.387
9	325745.806	6260287.478
10	325778.428	6260296.977
11	325784.913	6260322.816
12	325785.482	6260373.277

Legend:
Approximate Site Boundary

JBS&G

Job No: 52047

Client: NSW Land & Housing Corporation

Version: R01 Rev A | Date: 26-Sep-2016

Drawn By: SE | Checked By: LB

Scale 1:4,000

0 50 100
metres

Coor. Sys. GDA 1994 MGA Zone 56

Ivanhoe Estate,
Located Off Herring Road,
Macquarie Park, NSW

SITE LAYOUT

FIGURE 2:

File Name: 52047_02
Reference: http://maps.au.nearmap.com/, imagery 19/01/2016, accessed 06/04/2016

Legend:

Approximate Site Boundary

Land Zoning

B4 Mixed Use

RE1 Public Recreation

JBS&G

Job No: 52047

Client: NSW Land & Housing Corporation

Version: R01 Rev A	Date: 30-Sep-2016
Drawn By: SE	Checked By: LB

Scale 1:2,500

0 25 50

metres

Coor. Sys. GDA 1994 MGA Zone 56

Ivanhoe Estate,
Located Off Herring Road,
Macquarie Park, NSW

LAND ZONING

FIGURE 3:

File Name: 52047_03
Reference: http://maps.au.nearmap.com/, imagery 19/01/2016, accessed 06/04/2016

Legend:

- Approximate Site Boundary
- Areas of Environmental Concern
- Sample Location

JBS&G

Job No: 52047

Client: NSW Land & Housing Corporation

Version: R01 Rev A	Date: 26-Sep-2016
Drawn By: SE	Checked By: LB

Scale 1:2,500

0 25 50
metres

Coor. Sys. GDA 1994 MGA Zone 56

Ivanhoe Estate,
Located Off Herring Road,
Macquarie Park, NSW

AREAS OF ENVIRONMENTAL CONCERN AND SAMPLE LOCATIONS

FIGURE 4:

File Name: 52047_04
Reference: http://maps.au.nearmap.com/, imagery 19/01/2016, accessed 06/04/2016

Appendix A Summary Tables

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

Field ID	Depth (m)	Date	Lab Report #	Metals & Metalloids									TPHs (NEPC 1999)				
				Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Iron	Lead	Mercury (Inorganic)	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				2.00	0.40	1.00	1.00	20.00	1.00	0.05	1.00	1.00	20.00	20.00	50.00	50.00	50.00
NEPM 2013 EIL - Urban Residential (site specific)				100		190[#1]	220		1100		180	560					
NEPM 2013 EIL - Commercial and Industrial (site specific)				160		580[#1]	310		1100		310	800					
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																	
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil																	
NEPM 2013 Soil HIL A				100[#8]	20	100[#9]	6000		300[#10]	40[#11]	400	7400					
NEPM 2013 Soil HIL B				500[#8]	150	500[#9]	30000		1200[#10]	120[#11]	1200	60000					
NEPM 2013 Soil HIL C				300[#8]	90	300[#9]	17000		600[#10]	80[#11]	1200	30000					
NEPM 2013 Soil HIL D				3000[#8]	900	3600[#9]	240000		1500[#10]	730[#11]	6000	400000					
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																	
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																	
HA01 0.0-0.1	0.0-0.1	6/09/2016	514702	14	<0.4	21	23	-	47	<0.05	<5	41	<20	<20	<50	<50	<50
HA01 0.3-0.4	0.3-0.4	6/09/2016	514702	8.3	<0.4	13	12	-	27	<0.05	5.1	17	-	-	-	-	-
HA02 0.0-0.05	0.0-0.05	6/09/2016	514702	9.1	<0.4	9.9	16	-	45	<0.05	<5	45	<20	<20	51	82	133
HA02 0.2-0.3	0.2-0.3	6/09/2016	514702	11	<0.4	29	8.9	-	38	<0.05	<5	36	-	-	-	-	-
HA03 0.0-0.1	0.0-0.1	6/09/2016	514702	3.7 - 6.9	<0.4	6.7 - 10	9 - 18	26,000	16 - 19	<0.05	<5 - 16	47 - 53	-	-	-	-	-
QC20160906-01	0.0-0.1	6/09/2016	514702	7.8	<0.4	14	20	15,000	20	<0.05	17	57	-	-	-	-	-
QC20160906-01A	0.0-0.1	6/09/2016	152979	5	<0.4	14	16	-	19	<0.1	18	64	<25	<50	<100	<100	-
HA04 0.0-0.1	0.0-0.1	6/09/2016	514702	10	<0.4	33	24	-	18	<0.05	37	45	<20	<20	<50	<50	<50
HA04 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA05 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA06 0.0-0.1	0.0-0.1	6/09/2016	514702	9	<0.4	25	38	-	31	<0.05	40	73	-	-	-	-	-
HA07 0.0-0.1	0.0-0.1	6/09/2016	514702	4.5	<0.4	9.3	7.3	-	13	<0.05	5.4	47	<20	<20	<50	59	59
HA07 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA08 0.0-0.1	0.0-0.1	6/09/2016	514702	4.2	<0.4	5.1	<5	-	11	<0.05	<5	<5	-	-	-	-	-
HA09 0.0-0.1	0.0-0.1	6/09/2016	514702	2.8	<0.4	12	<5	-	5.4	<0.05	<5	<5	<20	33	91	68	192
HA10 0.0-0.1	0.0-0.1	6/09/2016	514702	4.8	<0.4	11	30	-	45	<0.05	11	63	-	-	-	-	-
HA10 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA11 0.0-0.1	0.0-0.1	6/09/2016	514702	6.8	<0.4	8.7	15	-	22	<0.05	10	45	<20	<20	54	63	117
HA11 0.3-0.4	0.3-0.4	6/09/2016	514702	5.5	<0.4	6.5	6.3	-	8.7	<0.05	5.1	12	-	-	-	-	-
HA12 0.0-0.1	0.0-0.1	6/09/2016	514702	9.3	<0.4	15	20	-	22	<0.05	13	32	-	-	-	-	-
HA13 0.0-0.1	0.0-0.1	6/09/2016	514702	9.2	<0.4	11	5.5	-	9	<0.05	<5	14	-	-	-	-	-
HA14 0.0-0.1	0.0-0.1	6/09/2016	514702	11	<0.4	78	22	-	16	<0.05	58	32	-	-	-	-	-
HA14 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.0-0.1	0.0-0.1	6/09/2016	514702	9.2	<0.4	26	15	-	17	<0.05	24	50	<20	27	380	450	857
HA15 0.0-0.1	0.0-0.1	6/09/2016	516962	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.0-0.1	0.0-0.1	6/09/2016	514702	<2	<0.4	<5	6.4	-	<5	<0.05	<5	12	-	-	-	-	-
HA16 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.0-0.1	0.0-0.1	5/09/2016	514668	7.5	<0.4	11	11	-	23	<0.05	<5	32	<20	<20	72	110	182
HA18 0.0-0.05	0-0.05	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.2-0.3	0.2-0.3	6/09/2016	514702	4.9	<0.4	13	<5	-	7.3	<0.05	<5	9.2	<20	<20	<50	<50	<50
HA19 0.2-0.3	0.2-0.3	5/09/2016	514668	8.8	<0.4	27	10	-	10	<0.05	20	17	-	-	-	-	-
HA19 0.0-0.1	0.0-0.1	5/09/2016	514668	5.9	<0.4	7.3	10	-	9.3	<0.05	<5	26	-	-	-	-	-
HA20 0.0-0.1	0.0-0.1	5/09/2016	514668	5.6	<0.4	13	12	-	16	<0.05	11	25	<20	<20	60	66	126
HA21 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.0-0.1	0.0-0.1	5/09/2016	514668	3.2	<0.4	<5	<5	-	9.1	<0.05	<5	14	-	-	-	-	-
HA22 0.0-0.1	0.0-0.1	5/09/2016	514668	8	<0.4	55	23	-	38	<0.05	48	45	-	-	-	-	-
HA23 0.2-0.3	0.2-0.3	5/09/2016	514668	3.5	<0.4	9.2	20	-	13	<0.05	15	18	-	-	-	-	-
HA23 0.0-0.1	0.0-0.1	5/09/2016	514668	5.6	<0.4	7.3	8.9	-	17	<0.05	<5	30	<20	27	100	130	257
HA24 0.0-0.05	0-0.05	5/09/2016	514668	3.9	<0.4	6.8	5.3	-	14	<0.05	<5	22	-	-	-	-	-
HA25 0.2-0.3	0.2-0.3	5/09/2016	514668	4.2	<0.4	11	9	-	18	<0.05	5.3	23	-	-	-	-	-
HA25 0-0.10	0.0-0.1	5/09/2016	514668	3.5	<0.4	11	8.9	-	17	<0.05	6.7	34	<20	<20	<50	<50	<50
HA26 0.0-0.1	0.0-0.1	5/09/2016	514668	8.9	<0.4	23	8.7	-	12	<0.05	<5	17	-	-	-	-	-
QC20160905-01	0.0-0.1	5/09/2016	514668	20	<0.4	32	18	-	16	<0.05	<5	27	-	-	-	-	-
QC20160905-01A	0.0-0.1	5/09/2016	152971	12	<0.4	25	11	-	14	<0.1	2	20	-	-	-	-	-
HA27 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.0-0.1	0.0-0.1	5/09/2016	514668	12	<0.4	17	5.4	28,000	22	<0.05	<5	20	<20	<20	54	170	224
HA28 0.0-0.1	0.0-0.1	5/09/2016	514668	4.5	<0.4	20	9.8	-	15	<0.05	8.9	52	-	-	-	-	-
HA28 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA29 0.0-0.1	0.0-0.1	5/09/2016	514668	3.8	<0.4	12	10	-	14	<0.05	6	28	<20	<20	<50	<50	<50
HA29 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA30 0.0-0.1	0.0-0.1	5/09/2016	514668	8.7	<0.4	13	15	-	38	0.23	7	50	<20	<20	<50	<50	<50
HA31 0.0-0.1	0.0-0.1	5/09/2016	514668	3.8	<0.4	12	11	-	33	<0.05	5.3	56	-	-	-	-	-
HA31 0.2-0.3	0.2-0.3	5/09/2016	514668	5.7	<0.4	9.5	13	-	33	<0.05	<5	42	-	-	-	-	-
HA32 0.4-0.5	0.4-0.5	5/09/2016	514668	4.3	<0.4	8	<5	-	8	<0.05	<5	<5	-	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	514668	12	<0.4	15	36	-	33	0.08	14	110	<20	43	360	310	713
HA32 0.0-0.05	0.0-0.5	5/09/2016	517819	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Field ID	TRHs (NEPC 2013)						TRHs (Silica-Gel)			BTEX					
	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	C6-C10 Fraction	C6 - C10 less BTEX (F1)	>C10 - C16 less Naphthalene (F2)	>C10-C16 Fraction (SG)	>C16-C34 Fraction (SG)	>C34-C40 Fraction (SG)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	50.00	100.00	100.00	20.00	20.00	50.00	50.00	100.00	100.00	0.10	0.10	0.10	0.20	0.10	0.30
NEPM 2013 EIL - Urban Residential (site specific)															
NEPM 2013 EIL - Commercial and Industrial (site specific)															
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil	120[#5]	300[#6]	2800[#6]	180[#7]	180[#5]	120[#5]	120[#5]	300[#6]	2800[#6]	50[#6]	70[#6]	85[#6]			105[#6]
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil	170[#5]	1700[#6]	3300[#6]	215[#7]	215[#5]	170[#5]	170[#5]	1700[#6]	3300[#6]	75[#6]	165[#6]	135[#6]			180[#6]
NEPM 2013 Soil HIL A												160[#12]			
NEPM 2013 Soil HIL B															
NEPM 2013 Soil HIL C															
NEPM 2013 Soil HIL D															
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m					45[#18]	110[#19]				0.5	55	160			40
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m					999999[#18]	999999[#19]				999999	999999	999999			999999
HA01 0.0-0.1	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA01 0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02 0.0-0.05	<50	120	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA02 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA03 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160906-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160906-01A	<50	<100	<100	<25	<25	<50	-	-	-	<0.2	<1	<0.5	<2	<1	-
HA04 0.0-0.1	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA04 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA05 0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA06 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA07 0.0-0.1	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA07 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA08 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA09 0.0-0.1	<50	150	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA10 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA10 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA11 0.0-0.1	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA11 0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA12 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA13 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA14 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA14 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.0-0.1	110	440	380	<20	<20	110	-	-	-	<0.1	<0.1	<0.1	0.5	0.2	0.8
HA15 0.0-0.1	-	-	-	-	-	-	<50	<100	<100	-	-	-	-	-	-
HA15 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.0-0.1	<50	140	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA18 0.0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.2-0.3	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA19 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA19 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA20 0.0-0.1	<50	110	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	0.2	0.1	0.4
HA21 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA22 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA23 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA23 0.0-0.1	<50	230	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA24 0.0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0-0.10	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA26 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160905-01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160905-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.0-0.1	<50	200	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	0.5	0.2	0.6
HA28 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA29 0.0-0.1	<50	<100	<100	<20	<20	<50	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA29 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA30 0.0-0.1	<50	<100	<100	<20	<20	<50		-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
HA31 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.0-0.05	97	540	230	<20	<20	97	-	-	-	<0.1	<0.1	<0.1	0.7	0.5	1.2
HA32 0.0-0.05	-	-	-	-	-	-	<50	<100	<100	-	-	-	-	-	-

Field ID	Polycyclic Aromatic Hydrocarbons																						
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Benzo(b,j+k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	Total Positive PAHs
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.10	0.10	0.10	0.10	0.05	0.50	0.50	0.50	0.50	0.10	0.50		0.10	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.50	
NEPM 2013 EIL - Urban Residential (site specific)																		170					
NEPM 2013 EIL - Commercial and Industrial (site specific)																		370					
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil					0.7[#6]																		
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil					1.4[#6]																		
NEPM 2013 Soil HIL A																			3[#13]			300[#14]	
NEPM 2013 Soil HIL B																			4[#13]			400[#14]	
NEPM 2013 Soil HIL C																			3[#13]			300[#14]	
NEPM 2013 Soil HIL D																			40[#13]			4000[#14]	
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																		3					
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																		999999					
HA01 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA01 0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02 0.0-0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA02 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA03 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
QC20160906-01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
QC20160906-01A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<1	-	-	-	-	-
HA04 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-
HA04 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA05 0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA06 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA07 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA07 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA08 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA09 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA10 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA10 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA11 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA11 0.3-0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA12 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA13 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA14 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA14 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA15 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA16 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA18 0.0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA19 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA19 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA20 0.0-0.1	2.5	2.4	2.5	2.4	2.5	5.9	5.9	5.9	3	3	2.7	-	2.4	2.2	2.5	2.8	3	<0.5 - 2.9	5.864[#2]	2.5	2.7	42	-
HA21 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.4-0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA21 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA22 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA23 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA23 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-
HA24 0.0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0-0.10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA26 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
QC20160905-01	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
QC20160905-01A	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	<0.1	-	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.172[#1]	<0.1	<0.1	-	0[#6]
HA27 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.0-0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA28 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA29 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-
HA29 0.2-0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA30 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-
HA31 0.0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.0-0.05	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#5]	<0.5	<0.5	<0.5	-
HA32 0.0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

				Polychlorinated Biphenyls								Organochlorine Pesticides																												Herbicides & Fungicides										Ecological Parameters				
				Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	Dieldrin	DDD	alpha-BHC	DDT	DDT+DDE+DDD (Sum of Total)	beta-BHC	alpha-Chlordane	Chlordane	delta-BHC	gamma-Chlordane	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Hexachlorobenzene	Lindane	Methoxychlor	Toxaphene	2,4,5-T	2,4-D	2,4-DB	Actril (loxynil)	Dicamba	Dichloroprop	Dinitro-o-cresol	Dinoseb	Fenoprop	MCPA	MCPB	Mecoprop	% Moisture 103oC	Cation Exchange Capacity	pH 1:5 soil:water	Total Organic Carbon	Conductivity (1:5 aqueous extract at 25°C)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	meq/100g	ph Units	%	uS/cm
EQL				0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.50	0.05	0.05		0.05	0.05	0.05	0.05		0.05		0.10	0.05		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.10	1.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	1.00	0.05	0.10	0.10	10.00
NEPM 2013 EIL - Urban Residential (site specific)																		180																																				
NEPM 2013 EIL - Commercial and Industrial (site specific)																		640																																				
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																																																				
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil																																																			
NEPM 2013 Soil HIL A											1[#15]			6					240			50						10			6		10		300	20	600	900									600	600	600					
NEPM 2013 Soil HIL B											1[#15]			10					600			90						20			10		15		500	30	900	1600									900	900	900					
NEPM 2013 Soil HIL C											1[#15]			10					400			70						20			10		10		400	30	800	1300									800	800	800					
NEPM 2013 Soil HIL D											7[#15]			45					3600			530						100			50		80		2500	160	5000	9000									5000	5000	5000					
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																																																				
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																																																				
Field ID	Depth (m)	Date	Lab Report #																																																			
HA01 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	-	-	-	-
HA01 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.2	-	-	-	-
HA02 0.0-0.05	0.0-0.05	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	39	-	-	-	-
HA02 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-
HA03 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	17 - 24	12	5.6	2.5	39
QC20160906-01	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	11	6.3	2.3	38
QC20160906-01A	0.0-0.1	6/09/2016	152979	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.2[#5]	<0.1	<0.1	<0.1	<0.1	<0.3[#1]	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	19	-	-	-	-
HA04 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12	-	-	-	-
HA04 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.3	-	-	-	-
HA05 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA06 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.4	-	-	-	-
HA07 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1	-	-	-	-
HA07 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA08 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-	-	-
HA09 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	9.7	-	-	-	-
HA10 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	-	-	-	-
HA10 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA11 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-
HA11 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA12 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
HA13 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.5	-	-	-	-
HA14 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA14 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-
HA15 0.0-0.1	0.0-0.1	6/09/2016	516962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.0-0.1	0.0-0.1	6/09/2016	514702	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	27	-	-	-	-
HA16 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA17 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	27	-	-	-	-
HA18 0.0-0.05	0-0.05	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-
HA19 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA19 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA20 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
HA21 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA21 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	13	-	-	-	-
HA22 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
HA23 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	-
HA23 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	21	-	-	-	-
HA24 0.0-0.05	0-0.05	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	20	-	-	-	-
HA25 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-	-	-
HA25 0-0.10	0.0-0.1	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA26 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-	-	-	-
QC20160905-01	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	-	-	-	-
QC20160905-01A	0.0-0.1	5/09/2016	152971	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	-	-	-	-
HA27 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA27 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	16	10	8.5	2.9	97
HA28 0.0-0.1	0.0-0.1	5/09/2016	514668	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA28 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA29 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA29 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA30 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18	-	-	-	-
HA31 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-	-
HA31 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12	-	-	-	-
HA32 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	514668	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.05	<0.1[#5]	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.05	-	<0.1	<0.05	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.5	<0.5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	46	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	517819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

				Asbestos - Trace Analysis																
				Approx. Sample Mass	Asbestos from ACM in Soil	Mass ACM	Mass Asbestos in ACM	Asbestos from FA & AF in Soil	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Synthetic Fibres - Comment	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment
				g	%w/w	g	g	%w/w	g	g	g	g	g	Comment	Comment	Comment	Comment	Comment	Comment
EQL																			
NEPM 2013 EIL - Urban Residential (site specific)																			
NEPM 2013 EIL - Commercial and Industrial (site specific)																			
NEPM 2013 ESL Urban Residential and Public Open Space, Coarse Soil																			
NEPM 2013 ESL Commercial and Insustrial, Coarse Soil																			
NEPM 2013 Soil HIL A																			
NEPM 2013 Soil HIL B																			
NEPM 2013 Soil HIL C																			
NEPM 2013 Soil HIL D																			
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Sand 0 to <1m																			
NEPM 2013 Soil HSL C for Vapour Intrusion - Sand 0 to <1m																			
Field ID	**Depth (m)**	**Date**	**Lab Report #**																
HA01 0.0-0.1	0.0-0.1	6/09/2016	514702	637	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA01 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA02 0.0-0.05	0.0-0.05	6/09/2016	514702	348	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA02 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA03 0.0-0.1	0.0-0.1	6/09/2016	514702	414 - 558	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
QC20160906-01	0.0-0.1	6/09/2016	514702	587	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
QC20160906-01A	0.0-0.1	6/09/2016	152979	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA04 0.0-0.1	0.0-0.1	6/09/2016	514702	553	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA04 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA05 0.3-0.4	0.3-0.4	6/09/2016	514702	744	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA06 0.0-0.1	0.0-0.1	6/09/2016	514702	662	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA07 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA07 0.2-0.3	0.2-0.3	6/09/2016	514702	624	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA08 0.0-0.1	0.0-0.1	6/09/2016	514702	623	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA09 0.0-0.1	0.0-0.1	6/09/2016	514702	570	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA10 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA10 0.2-0.3	0.2-0.3	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA11 0.0-0.1	0.0-0.1	6/09/2016	514702	508	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA11 0.3-0.4	0.3-0.4	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA12 0.0-0.1	0.0-0.1	6/09/2016	514702	613	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA13 0.0-0.1	0.0-0.1	6/09/2016	514702	617	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA14 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA14 0.2-0.3	0.2-0.3	6/09/2016	514702	493	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA15 0.0-0.1	0.0-0.1	6/09/2016	514702	477	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA15 0.0-0.1	0.0-0.1	6/09/2016	516962	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA15 0.2-0.3	0.2-0.3	6/09/2016	514702	492	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA16 0.0-0.1	0.0-0.1	6/09/2016	514702	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA16 0.2-0.3	0.2-0.3	6/09/2016	514702	615	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA17 0.2-0.3	0.2-0.3	5/09/2016	514668	372	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA17 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA18 0.0-0.05	0-0.05	6/09/2016	514702	341	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA18 0.2-0.3	0.2-0.3	6/09/2016	514702	442	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA19 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA19 0.0-0.1	0.0-0.1	5/09/2016	514668	535	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA20 0.0-0.1	0.0-0.1	5/09/2016	514668	407	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA21 0.2-0.3	0.2-0.3	5/09/2016	514668	619	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA21 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA21 0.0-0.1	0.0-0.1	5/09/2016	514668	528	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA22 0.0-0.1	0.0-0.1	5/09/2016	514668	528	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA23 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA23 0.0-0.1	0.0-0.1	5/09/2016	514668	409	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA24 0.0-0.05	0-0.05	5/09/2016	514668	400	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA25 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA25 0-0.10	0.0-0.1	5/09/2016	514668	519	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA26 0.0-0.1	0.0-0.1	5/09/2016	514668	446	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
QC20160905-01	0.0-0.1	5/09/2016	514668	355	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
QC20160905-01A	0.0-0.1	5/09/2016	152971	409	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-
HA27 0.2-0.3	0.2-0.3	5/09/2016	514668	688	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA27 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA28 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA29 0.0-0.1	0.0-0.1	5/09/2016	514668	647	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA29 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA30 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.0-0.1	0.0-0.1	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA31 0.2-0.3	0.2-0.3	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.4-0.5	0.4-0.5	5/09/2016	514668	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA32 0.0-0.05	0.0-0.5	5/09/2016	514668	283	0	0	0	0	0	0	0	0	0	[1#7]	[1#7]	[1#7]	[1#7]	[1#4]	[1#3]
HA32 0.0-0.05	0.0-0.5	5/09/2016	517819	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table A: Soil Analytical Data
Project Number: 52047
Project Name: Ivanhoe DSI

Env Stds Comments

#1:TV taken for Chromium (III), Clay Content of 1%
#2:TV taken for pH 4.5
#3:TV taken for CEC 5
#4:TV taken for pH 4 and CEC 5
#5:ESLs are of moderate reliability.
#6:ESLs are of low reliability.
#7:ESLs are of moderate reliability. To obtain F1 subtract the sum of BTEX from C6-C10.
#8:Key limitations of HSL should be referred to prior to application in Friebel and Nadebaum (2011b and 2011d).
#9:TV adopted from Chromium (VI)
#10:Assumptions of HSL are presented in Friebel and Nadebaum (2011a and 2011b).
#11:Refer to HSL and soil saturation concentration limit.
#12:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation.
#13:Refer to Section 8.2 and Appendix J in Friebel and Nadebaum (2011a).
#14:TV maybe be multiplied by a factor to account for biodegradation of vapour
#15:HIL relates to non-dioxin-like PCBs only. If PCB source is suspected a site-specific assessment should be untertaken
#16:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F1 subtract the sum of BTEX from C6-C10.
#17:Sensitive setting HSL A & HSL B Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F2 subtract naohthalene from >C10-C16.
#18:To obtain F1 subtract the sum of BTEX from C6-C10.
#19:To obtain F2 subtract naohthalene from >C10-C16.
#20:Sensitive setting HSL C Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F1 subtract the sum of BTEX from C6-C10. NL - Not Limiting.
#21:Sensitive setting HSL C Sand 0m to <1m criteria adopted. Exceedence quantifies further interpretation. To obtain F2 subtract naohthalene from >C10-C16. NL - Not Limiting.
#22:Sensitive setting HSL C Sand 0m to <1m criteria adopted. NL - Not Limiting. Exceedence quantifies further interpretation.

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 No respirable fibres detected
#4 Organic fibres detected.
#5 ESDAT Combined.
#6 NIL (+)VE
#7 Nil

Appendix B Photographic Log

PHOTOGRAPH 1 – HA01

PHOTOGRAPH 2 – HA02

PHOTOGRAPH 3 – HA05

PHOTOGRAPH 4 – HA08

Job No: 52047	
Client: NSW Land and Housing Corporation	
Version: R01	Date: 28/092016
Drawn By: LB	Checked By: LB
Not to Scale	
Coord. Sys n/a	

Ivanhoe Estate

APPENDIX A

PHOTOGRAPH 5 – HA09

PHOTOGRAPH 6 – HA09

PHOTOGRAPH 7 – HA14

PHOTOGRAPH 8 – HA15

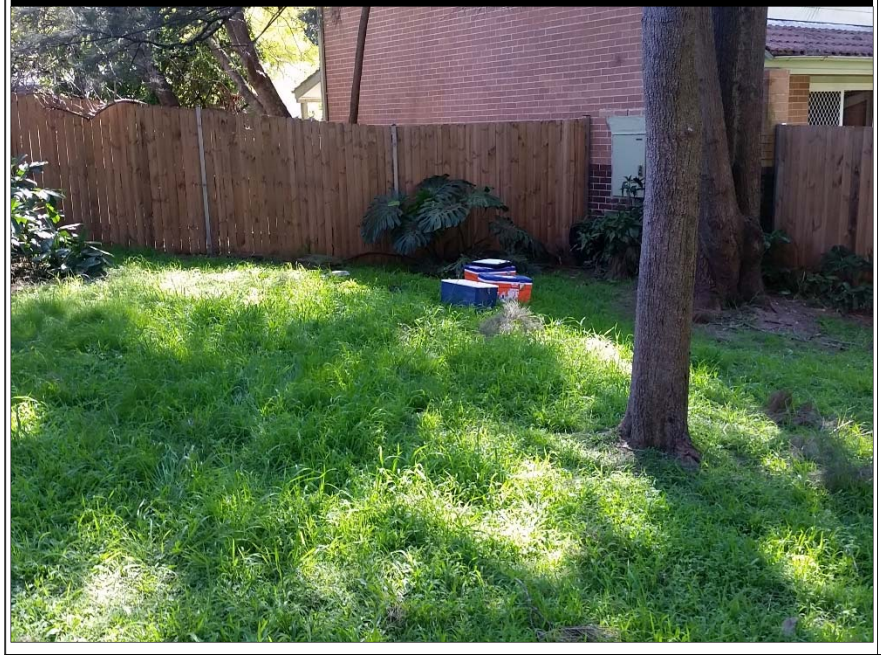
JBS&G

Job No: 52047	
Client: NSW Land and Housing Corporation	
Version: R01	Date: 28/092016
Drawn By: LB	Checked By: LB
Not to Scale	
Coord. Sys n/a	
Ivanhoe Estate	
APPENDIX A	

PHOTOGRAPH 9 – HA18

PHOTOGRAPH 10 – HA22

PHOTOGRAPH 11 – HA27



PHOTOGRAPH 12 – HA27

JBS&G

Job No: 52047	
Client: NSW Land and Housing Corporation	
Version: R01	Date: 28/092016
Drawn By: LB	Checked By: LB
Not to Scale	
Coord. Sys n/a	

Ivanhoe Estate

APPENDIX A

PHOTOGRAPH 13 – HA27

PHOTOGRAPH 14 – HA29

PHOTOGRAPH 15 – HA29

PHOTOGRAPH 16 – HA31

JBS&G

Job No: 52047	
Client: NSW Land and Housing Corporation	
Version: R01	Date: 28/092016
Drawn By: LB	Checked By: LB
Not to Scale	
Coord. Sys n/a	
Ivanhoe Estate	
APPENDIX A	

Appendix C Borehole Logs

HA01

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular, sub-rounded with inclusions of sandstone gravels concrete and brick fragments	HA01 0.0-0.1	No Odours, Staining or Asbestos
		0.30		Fill	Fill - Silty SAND - Light brown, heterogeneous, damp, fine to medium grained angular, homogeneous loose	HA01 0.3-0.4	No Odours, Staining or Asbestos
	0.5						
		0.60			Borehole HA01 terminated at 0.6m		
	1.0						

HA02

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - dark brown, heterogeneous, damp, poorly graded, very loose	HA02 0.0-0.05	No Odours, Staining or Asbestos
		0.05		Fill	Fill - Gravelly SAND - brown/grey, homogeneous, damp, fine to medium grained, very loose sandstone gravel	HA02 0.2-0.3	No Odours, Staining or Asbestos
	0.5	0.30			Borehole HA02 terminated at 0.3m		
	1.0						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 30/9/16

HA03

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.15
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - dark brown, heterogeneous, damp, poorly graded, angular, loose consistency	HA03 0.0-0.1	Refusal on sandstone No Odours, Staining or Asbestos
		0.15			Borehole HA03 terminated at 0.15m		
	0.5						
	1.0						

HA04

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular- sub-angular	HA04 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA04 0.2-0.3	Refusal on sandstone
		0.30			Borehole HA04 terminated at 0.3m		No Odours, Staining or Asbestos
	0.5						
	1.0						

HA05

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Gravelly SAND - Dark brown, heterogeneous , damp, poorly graded, fine to medium grained, angular to sub-rounded, very loose, inclusions of roots	HA05 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, dry, poorly graded, fine to medium grained, angular to sub-rounded, loose, non plastic, firm weathered SST sandstone	HA05 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA05 terminated at 0.4m		
	0.5						
	1.0						

HA06

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high organic content and rare glass fragments.	HA06 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Greyish brown, homogeneous, damp, gravelly, fine to medium grained, angular to sub-rounded, frequent sandstone gravels		
						HA06 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA06 terminated at 0.4m		
	0.5						
	1.0						

HA07

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey Gravelly SAND - Orange brown, homogeneous, damp, poorly graded fine to medium grained, angular to sub-rounded, loose to medium dense with frequent sandstone	HA07 0.0-0.1	No Odours, Staining or Asbestos
		0.40			Borehole HA07 terminated at 0.4m		
	0.5						
	1.0						

HA08

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey SAND - Orangish brown, homogeneous, dry, non plastic, firm to stiff, weathered bedrock	HA08 0.0-0.1	Refusal on sandstone bedrock No Odours, Staining or Asbestos
		0.20			Borehole HA08 terminated at 0.2m		
	0.5						
	1.0						

HA09

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, dry, fine to medium grained, angular to sub-rounded, non plastic, firm to stiff	HA09 0.0-0.1	No Odours, Staining or Asbestos
		0.20			Borehole HA09 terminated at 0.2m		
	0.5						
	1.0						

HA10

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown, poorly graded, fine to medium grained, angular to sub-rounded	HA10 0.0-0.1	No Odours, Staining or Asbestos
		0.40			Borehole HA10 terminated at 0.4m		
	0.5						
	1.0						

HA11

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high organic content	HA11 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly SAND - Orangish brown, homogeneous, poorly graded, fine to medium grained, angular to sub-rounded		
						HA11 0.3-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA11 terminated at 0.4m		
	0.5						
	1.0						

HA12

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, high in organic and root content	HA12 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, poorly graded, fine to medium grain, angular to sub-rounded, low plasticity	HA12 0.3-0.4	No Odours, Staining or Asbestos
	0.5	0.40			Borehole HA12 terminated at 0.4m		
	1.0						

HA13

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly SAND - Orangish brown, poorly graded, fine to medium grained, angular to sub-rounded, very loose to medium dense	HA13 0.0-0.1	No Odours, Staining or Asbestos
							Refusal on sandstone bedrock
		0.20			Borehole HA13 terminated at 0.2m		
	0.5						
	1.0						

HA14

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, loose density, high organic content	HA14 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Greyish brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded		
						HA14 0.2-0.3	No Odours, Staining or Asbestos
		0.30			Borehole HA14 terminated at 0.2m		
	0.5						
	1.0						

HA15

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA15 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, damp, fine to medium grained, low plasticity	HA15 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA15 terminated at 0.4m		
	0.5						
	1.0						

HA16

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown,heterogeneous, damp, poorly graded, high organic content	HA16 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Light brown,homogeneous, dry, poorly graded, fine to medium grained, angular to sub-rounded, roots present	HA16 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA16 terminated at 0.4m		
	0.5						
	1.0						

HA17

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA17 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, homogeneous, damp, poorly graded, very angular, loose density	HA17 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA17 terminated at 0.4m		
	0.5						
	1.0						

HA18

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 6/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Gravelly SAND - Dark brown, poorly graded, very loose, high organic matter	HA18 0.0-0.05	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Dark yellowish brown, homogeneous, damp, low plasticity		
	0.5					HA18 0.2-0.3	No Odours, Staining or Asbestos
		0.60			Borehole HA18 terminated at 0.6m		
	1.0						

HA19

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, loose density	HA19 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Silty SAND - Orangish brown, heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded,	HA19 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA19 terminated at 0.4m		
	0.5						
	1.0						

HA20

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.15
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Dark brown,heterogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded, loose density	HA20 0.0-0.1	No Odours, Staining or Asbestos Refusal on sandstone
		0.15			Borehole HA20 terminated at 0.15m		
	0.5						
	1.0						

HA21

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Brown, heterogeneous, damp, roots present	HA21 0.0-0.1	No Odours, Staining or Asbestos
		0.15		Fill	Fill - Clayey SAND - Brown, homogeneous, dense	HA21 0.2-0.5	No Odours, Staining or Asbestos
	0.5	0.50			Borehole HA21 terminated at 0.5m		
	1.0						

HA22

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Clayey SAND - Brown, heterogeneous, damp, poorly graded, very angular to sub-rounded, loose density	HA22 0.0-0.1	No Odours, Staining or Asbestos
		0.10					Refusal on sandstone
					Borehole HA22 terminated at 0.4m		
	0.5						
	1.0						

HA23

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, very angular to rounded, very loose density,	HA23 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Gravelly Clayey SAND - Orangish brown, heterogeneous, poorly graded, fine to medium grained, angular to sub-rounded, brick fragments and roots present	HA23 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA23 terminated at 0.4m		
	0.5						
	1.0						

HA24

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, organic matter present	HA24 0.0-0.05	No Odours, Staining or Asbestos
		0.15		Fill	Fill - Clayey SAND - Orangish brown, homogeneous, damp, vary angular to sub-rounded, loose density	HA24 0.1-0.2	No Odours, Staining or Asbestos
	0.5	0.20			Borehole HA24 terminated at 0.2m		
	1.0						

HA25

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - heterogeneous, damp, medium density, roots present	HA25 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Brown, homogeneous, medium to coarse grain size, angular, dense	HA25 0.2-0.3	No Odours, Staining or Asbestos
		0.30			Borehole HA25 terminated at 0.3m		
	0.5						
	1.0						

HA26

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Dark brown, heterogeneous, damp, poorly graded, fine to coarse grained, angular to sub-rounded, brick fragments present	HA26 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Orangish brown, homogeneous, damp, firm density, low plasticity, weathered sandstone		
						HA26 0.2-0.3	No Odours, Staining or Asbestos
		0.40			Borehole HA26 terminated at 0.4m		
	0.5						
	1.0						

HA27

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Dark brown, heterogenous, damp, poorly graded, fine to medium grained, very loose density	HA27 0.0-0.1	No Odours, Staining or Asbestos
		0.20		Fill	Fill - Clayey SAND - Brown, homogeneous, damp, poorly graded, fine to medium grained, angular to sub-rounded	HA27 0.2-0.3	No Odours, Staining or Asbestos
	0.5						
		0.50			Borehole HA27 terminated at 0.5m		
	1.0						

HA28

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty Clayey SAND - Brown, homogeneous, damp, poorly graded, organic matter present	HA28 0.0-0.1	No Odours, Staining or Asbestos
		0.10		Fill	Fill - Clayey SAND - Brown, heterogeneous, damp, soft to firm consistency, brick and sandstone fragments present	HA28 0.2-0.3	No Odours, Staining or Asbestos
	0.5						
		0.50			Borehole HA28 terminated at 0.5m		
	1.0						

HA29

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.3
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Clayey SAND - Dark brown, heterogeneous, soft to firm consistency, traces of brick fragments	HA29 0.0-0.1	No Odours, Staining or Asbestos
		0.30			Borehole HA29 terminated at 0.3m		
	0.5						
	1.0						

HA30

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.2
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Gravelly Silty SAND - Dark brown, heterogeneous, damp, poorly graded, angular to sub-angular, loose density with inclusions of sandstone and organic matter present	HA30 0.0-0.1	No Odours, Staining or Asbestos
							Refusal on sandstone bedrock
		0.20			Borehole HA30 terminated at 0.2m		
	0.5						
	1.0						

HA31

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.4
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - Silty SAND - Dark brown, heterogenous, damp, poorly graded, fine to medium grained, very loose density	HA31 0.0-0.4	No Odours, Staining or Asbestos
		0.40			Borehole HA31 terminated at 0.4m		
	0.5						
	1.0						

HA32

Project Number: 52047
Client: NSW Land & Housing Corporation
Project Name: Ivanhoe Estate PSI
Site Address: Herring Rd, Macquarie Park, NSW

Date: 5/09/2016
Logged By: A.Finney/L.Blecher
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 50

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill Fill	Fill - Clayey SAND - Dark brown, heterogenous, damp, poorly graded, high organic content Fill - Gravelly Clayey SAND - Dark brown, heterogenous, damp, poorly graded, low plasticity, soft consistency	HA32 0.0-0.05	No Odours, Staining or Asbestos
		0.05					No Odours, Staining or Asbestos
		0.30		Fill	Fill - Gravelly Clayey SAND - Yellowish brown, homogeneous, damp, low plasticity, soft consistency	HA32 0.05-0.3	
	0.5					HA32 0.4-0.5	No Odours, Staining or Asbestos
		0.60			Borehole HA32 terminated at 0.6m		
	1.0						

Appendix D Derived Ecological Criteria

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
29
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
23000
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
high

Outputs		
Land use	Cr III soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	32700	200
Urban residential and open public spaces	32800	580
Commercial and industrial	33000	960

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
11
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.8
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
23000
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
high

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	4000	220
Urban residential and open public spaces	4100	560
Commercial and industrial	4200	800

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
11
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
23000
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
high

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	7900	35
Urban residential and open public spaces	7900	180
Commercial and industrial	8000	310

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
11
Enter soil pH (calcium chloride method) (values from 1 to 14)
6.8
Enter organic carbon content (%OC) (values from 0 to 50%)
5
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
23000
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
high

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	3100	95
Urban residential and open public spaces	3100	220
Commercial and industrial	3200	310

Appendix E Laboratory and COC Documentation

S14668

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: S2047	LABORATORY BATCH NO.:
PROJECT NAME: Macquarie Park, NSW	SAMPLERS: A. Finney L. Blecher
DATE NEEDED BY: STD TAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) LBlecher@jbsg.com.au; (3) AFinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Analysis as per summary table

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Heavy Metals	PAH	TRH/BTEX	Asbestos	OCP/PCBs	Herbicides	am,Fe,CEC,pH	ASLP/TCLP	JB2A	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA17 0-0.10m	Soil	05/09	-	Bag, Jar, Ice		X	X	X		X							
HA17, 0.2-0.3m									X								
HA19, 0-0.10m						X			X	X							
HA19, 0.2-0.3m						X	X										
HA20 0-0.10m						X	X	X	X	X				X			
HA21 0-0.1m						X	X		X	X	X						
HA21 0.2-0.3m									X								
HA21 0.4-0.5m							X										
HA22 0-0.1m						X	X		X								
HA22 0.2-0.3m						X											
HA23 0-0.1m						X		X	X	X							
HA23 0.2-0.3m						X	X										
HA24 0-0.05m						X			X	X	X						
HA24 0.1-0.2m							X										
HA25 0-0.1m						X	X	X	X	X				X			
HA25 0.2-0.3m						X											
HA26 0-0.1m						X	X		X								
HA26 0.2-0.3m																	

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DF DATE: 05/09	CONSIGNMENT NOTE NO.	NAME: Sinmak 1545	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 6.9.16	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Page 2 of 2

JBS&G

CHAIN OF CUSTODY

PROJECT NO.: 52047	LABORATORY BATCH NO.:
PROJECT NAME: Macquarie Park, NSW	SAMPLERS: A. Finney L. Blecher
DATE NEEDED BY: STD TAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) L.Blecher@jbsg.com.au; (3) A.Finney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL: [illegible]

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	heavy Metals	PAH	TRH/BTEX	Asbestos	OCPs/PCBs	Herbicides	OM, Fe, CEC, pH	ASLP/TCLP	JB2A										IDENTIFICATION	NEPM/WA	NOTES:
HA27 0-0.1m	Soil	05/09	-	Jar, Bag, Ice		X	X	X		X	X	X														
HA27 0.2-0.3m	↓	↓		↓					X																	
HA28 0-0.1m	↓	↓		↓		X				X																
HA28 0.2-0.3m	↓	↓		↓			X																			
HA29 0-0.1m	↓	↓		↓		X		X	X																	
HA29 0.2-0.3m	↓	↓		↓			X																			
HA30 0-0.1m	↓	↓		↓		X		X																		
HA31 0-0.1m	↓	↓		↓		X																				
HA31 0.2-0.3m	↓	↓		↓		X																				
HA32 0-0.05m	↓	↓		↓		X	X	X	X	X	X			X												
HA32 0.2-0.3m	↓	↓		↓																						
HA32 0.4-0.5m	↓	↓		↓		X																				
QC20160905-01	↓	↓		↓		X	X		X																	
Trip Spike	Water	[illegible]		Vial / Ice				X																		
Trip Blank	Water	[illegible]		Vial / Ice				X																		
Rinsate	Water	↓		VC, B, N, Ice		X	X	X		X	X															

TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION / NEPM/WA

RELINQUISHED BY:		METHOD OF SHIPMENT:	RECEIVED BY:		FOR RECEIVING LAB USE ONLY:
NAME: [signature] OF: JBS&G	DATE: 05/09	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: SS DATE: 6.9.16 OF: [signature]		COOLER SEAL – Yes....... No .... Intact .... Broken .... COOLER TEMP .... deg C
NAME: OF:	DATE:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: OF:	DATE:	COOLER SEAL – Yes....... No .... Intact .... Broken .... COOLER TEMP .... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047	LABORATORY BATCH NO.:
PROJECT NAME: Macquarie Park, NSW	SAMPLERS: A. Finney L. Blecher
DATE NEEDED BY: STD TAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) LBlecher@jbsg.com.au; (3) AFinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Analytes sent via email tomorrow

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA17, 0-0.10m	Soil	05/09	–	Bag, Jar, Ice				
HA17, 0.2-0.3m	↓	↓		↓				
HA19, 0-0.10m								
HA19 0.2-0.3m								
HA20 0-0.10m								
HA21 0-0.1 m								
HA21 0.2-0.3 m								
HA21 0.4-0.5m								
HA22 0-0.1m								
HA22 0.2-0.3m								
HA23 0-0.1m								
HA23 0.2-0.3m								
HA24 0-0.05m								
HA24 0.1-0.2m								
HA25 0-0.1m								
HA25 0.2-0.3m								
HA26 0-0.1m								
HA26 0.2-0.3m								

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DFinney DATE: 05/09	CONSIGNMENT NOTE NO.	NAME: Stamatis 1760	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 5.9.16	
		OF: EFM SG	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047
PROJECT NAME: Macquarie Park, NSW
DATE NEEDED BY: STD TAT

LABORATORY BATCH NO.:
SAMPLERS: A. Finney L. Blecher
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) LBlecher@jbsg.com.au; (3) AFinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Analytes sent via email tomorrow.

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
HA27 0-0.1m	Soil	05/09	-	Jar, Bag, Ice				
HA27 0.2-0.3m								
HA28 0-0.1m								
HA28 0.2-0.3m								
HA29 0-0.1m								
HA29 0.2-0.3m								
HA30 0-0.1m								
HA31 0-0.1m								
HA31 0.2-0.3m								
HA32 0-0.05m								
HA32 0.2-0.3m								
HA32 0.4-0.5m								
QC20160905-01	Water			Vial / Ice				
Trip Spike	Water			Vial / Ice				
Trip Blank	Water			VC, B, N, Ice				
Rinsate								

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: [signature] DATE: 05/09	CONSIGNMENT NOTE NO.	NAME: SS	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 5.9.16	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Sean 7/9 12:24
514668

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Wednesday, 7 September 2016 12:24 PM
To: Nibha Vaidya; Alex Finney
Cc: Alex Finney
Subject: RE: 52047 CoC Schedule

This should be TOC, not OM.

Thanks,

Lindsey

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Wednesday, 7 September 2016 12:21 PM
To: Alex Finney <AFinney@jbsg.com.au>
Cc: Lindsey Blecher <LBlecher@jbsg.com.au>
Subject: RE: 52047 CoC Schedule

Hi Alex,

Just wanted to double-check if you will require any TCLP/ASLP analysis at this stage?

Further, could you clarify the test 'OM' just to make sure if we do the correct analysis?

Thanks,
Nibha

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

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Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW & WA) P/L**
Contact name:	Lindsey Blecher
Project name:	MACQUARIE PARK
Project ID:	52047
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 6, 2016 5:25 PM
Eurofins | mgt reference:	**514702**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

HA18 0.0-0.5 was missing (bag and jar), however 1x extra sample was received, HA18 0.0-0.1 (bag only)| Labelling discrepancy: COC-HA14 0.2-0.3, Jar/bag HA14 0.1-0.2. We have labelled as per the COC

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Lindsey Blecher - LBlecher@jbsg.com.au.

eurofins | mgt

Certificate of Analysis

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Lindsey Blecher**

Report **514668-S**
Project name MACQUARIE PARK NSW
Project ID 52047
Received Date Sep 06, 2016

Client Sample ID			**HA17 0-0.10M**	**HA19 0-0.1M**	**HA19 0.2-0.3M**	**HA20 0-0.10M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05660**	**S16-Se05662**	**S16-Se05663**	**S16-Se05664**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	-	< 20
TRH C10-C14	20	mg/kg	< 20	-	-	< 20
TRH C15-C28	50	mg/kg	72	-	-	60
TRH C29-C36	50	mg/kg	110	-	-	66
TRH C10-36 (Total)	50	mg/kg	182	-	-	126
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	0.2
o-Xylene	0.1	mg/kg	< 0.1	-	-	0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	0.4
4-Bromofluorobenzene (surr.)	1	%	81	-	-	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	-	< 50
TRH C6-C10	20	mg/kg	< 20	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	5.9
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	5.9
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	5.9
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	2.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	2.4
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	2.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	2.4
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	2.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	3.0
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	3.0
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	2.7
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	2.4
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	2.2
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	2.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	2.8
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	3.0

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA17 0-0.10M Soil S16-Se05660 Sep 05, 2016	HA19 0-0.1M Soil S16-Se05662 Sep 05, 2016	HA19 0.2-0.3M Soil S16-Se05663 Sep 05, 2016	HA20 0-0.10M Soil S16-Se05664 Sep 05, 2016
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	2.9
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	2.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	2.7
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	42
2-Fluorobiphenyl (surr.)	1	%	75	-	93	99
p-Terphenyl-d14 (surr.)	1	%	98	-	114	115
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	119	122	-	125
Tetrachloro-m-xylene (surr.)	1	%	124	122	-	109
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	119	122	-	-
Tetrachloro-m-xylene (surr.)	1	%	124	122	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	125

Client Sample ID			HA17 0-0.10M	HA19 0-0.1M	HA19 0.2-0.3M	HA20 0-0.10M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05660	S16-Se05662	S16-Se05663	S16-Se05664
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	-	< 50
TRH >C16-C34	100	mg/kg	140	-	-	110
TRH >C34-C40	100	mg/kg	< 100	-	-	< 100
% Moisture	1	%	27	13	12	14
Heavy Metals						
Arsenic	2	mg/kg	7.5	5.9	8.8	5.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	7.3	27	13
Copper	5	mg/kg	11	10	10	12
Lead	5	mg/kg	23	9.3	10	16
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	20	11
Zinc	5	mg/kg	32	26	17	25

Client Sample ID			HA21 0-0.10M	HA21 0.4-0.5M	HA22 0-0.1m	HA23 0-0.10M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05665	S16-Se05667	S16-Se05668	S16-Se05670
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	27
TRH C15-C28	50	mg/kg	-	-	-	100
TRH C29-C36	50	mg/kg	-	-	-	130
TRH C10-36 (Total)	50	mg/kg	-	-	-	257
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA21 0-0.10M Soil S16-Se05665 Sep 05, 2016	HA21 0.4-0.5M Soil S16-Se05667 Sep 05, 2016	HA22 0-0.1m Soil S16-Se05668 Sep 05, 2016	HA23 0-0.10M Soil S16-Se05670 Sep 05, 2016
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	98	101	73	-
p-Terphenyl-d14 (surr.)	1	%	111	104	75	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	-	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	-	-	< 0.2
Toxaphene	1	mg/kg	< 1	-	-	< 1
Dibutylchlorendate (surr.)	1	%	104	-	-	126
Tetrachloro-m-xylene (surr.)	1	%	102	-	-	119
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	104	-	-	126
Tetrachloro-m-xylene (surr.)	1	%	102	-	-	119

Client Sample ID			HA21 0-0.10M	HA21 0.4-0.5M	HA22 0-0.1m	HA23 0-0.10M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05665	S16-Se05667	S16-Se05668	S16-Se05670
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	-	-	-
2.4-DB	0.5	mg/kg	< 0.5	-	-	-
2.4.5-T	0.5	mg/kg	< 0.5	-	-	-
2.4.5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	79	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	-	< 50
TRH >C16-C34	100	mg/kg	-	-	-	230
TRH >C34-C40	100	mg/kg	-	-	-	< 100
% Moisture	1	%	13	12	14	21
Heavy Metals						
Arsenic	2	mg/kg	3.2	-	8.0	5.6
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	-	55	7.3
Copper	5	mg/kg	< 5	-	23	8.9
Lead	5	mg/kg	9.1	-	38	17
Mercury	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	-	48	< 5
Zinc	5	mg/kg	14	-	45	30

Client Sample ID			HA23 0.2-0.3M	HA24 0-0.05M	HA25 0-0.10M	HA25 0.2-0.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05671	S16-Se05672	S16-Se05674	S16-Se05675
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	85	-

Client Sample ID			HA23 0.2-0.3M	HA24 0-0.05M	HA25 0-0.10M	HA25 0.2-0.3M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05671**	**S16-Se05672**	**S16-Se05674**	**S16-Se05675**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	73	-	106	-
p-Terphenyl-d14 (surr.)	1	%	80	-	106	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA23 0.2-0.3M Soil S16-Se05671 Sep 05, 2016	HA24 0-0.05M Soil S16-Se05672 Sep 05, 2016	HA25 0-0.10M Soil S16-Se05674 Sep 05, 2016	HA25 0.2-0.3M Soil S16-Se05675 Sep 05, 2016
Organochlorine Pesticides						
Dibutylchlorendate (surr.)	1	%	-	104	107	-
Tetrachloro-m-xylene (surr.)	1	%	-	116	125	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	104	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	116	-	-
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	75	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	107	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
% Moisture	1	%	10	20	15	11
Heavy Metals						
Arsenic	2	mg/kg	3.5	3.9	3.5	4.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.2	6.8	11	11
Copper	5	mg/kg	20	5.3	8.9	9.0
Lead	5	mg/kg	13	14	17	18
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			HA23 0.2-0.3M	HA24 0-0.05M	HA25 0-0.10M	HA25 0.2-0.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05671	S16-Se05672	S16-Se05674	S16-Se05675
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Heavy Metals						
Nickel	5	mg/kg	15	< 5	6.7	5.3
Zinc	5	mg/kg	18	22	34	23

Client Sample ID			HA26 0-0.1m	HA27 0-0.10M	HA28 0-0.1M	HA28 0.2-0.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05676	S16-Se05678	S16-Se05680	S16-Se05681
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	54	-	-
TRH C29-C36	50	mg/kg	-	170	-	-
TRH C10-36 (Total)	50	mg/kg	-	224	-	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	0.5	-	-
o-Xylene	0.1	mg/kg	-	0.2	-	-
Xylenes - Total	0.3	mg/kg	-	0.6	-	-
4-Bromofluorobenzene (surr.)	1	%	-	71	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA26 0-0.1m Soil S16-Se05676 Sep 05, 2016	HA27 0-0.10M Soil S16-Se05678 Sep 05, 2016	HA28 0-0.1M Soil S16-Se05680 Sep 05, 2016	HA28 0.2-0.3M Soil S16-Se05681 Sep 05, 2016
Polycyclic Aromatic Hydrocarbons						
2-Fluorobiphenyl (surr.)	1	%	88	87	-	73
p-Terphenyl-d14 (surr.)	1	%	81	104	-	85
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	< 0.05	-
a-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Aldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
b-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
d-BHC	0.05	mg/kg	-	< 0.05	< 0.05	-
Dieldrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan I	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan II	0.05	mg/kg	-	< 0.05	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	< 0.05	-
Endrin ketone	0.05	mg/kg	-	< 0.05	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor	0.05	mg/kg	-	< 0.05	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	< 0.05	-
Methoxychlor	0.2	mg/kg	-	< 0.2	< 0.2	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Dibutylchlorendate (surr.)	1	%	-	105	140	-
Tetrachloro-m-xylene (surr.)	1	%	-	107	112	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	< 0.5	-
Total PCB*	0.5	mg/kg	-	< 0.5	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	105	140	-
Tetrachloro-m-xylene (surr.)	1	%	-	107	112	-
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			HA26 0-0.1m	HA27 0-0.10M	HA28 0-0.1M	HA28 0.2-0.3M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05676	S16-Se05678	S16-Se05680	S16-Se05681
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Acid Herbicides						
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	75	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	200	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	97	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	-	8.5	-	-
Total Organic Carbon	0.1	%	-	2.9	-	-
% Moisture	1	%	14	16	15	12
Heavy Metals						
Arsenic	2	mg/kg	8.9	12	4.5	-
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	-
Chromium	5	mg/kg	23	17	20	-
Copper	5	mg/kg	8.7	5.4	9.8	-
Iron	20	mg/kg	-	28000	-	-
Lead	5	mg/kg	12	22	15	-
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	-
Nickel	5	mg/kg	< 5	< 5	8.9	-
Zinc	5	mg/kg	17	20	52	-
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	10	-	-

Client Sample ID			HA29 0-0.1M	HA29 0.2-0.3M	HA30 0-0.1M	HA31 0-0.1M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se05682	S16-Se05683	S16-Se05684	S16-Se05685
Date Sampled			Sep 05, 2016	Sep 05, 2016	Sep 05, 2016	Sep 05, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	< 50	-
TRH C29-C36	50	mg/kg	< 50	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	67	-	78	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-

Client Sample ID			HA29 0-0.1M	HA29 0.2-0.3M	HA30 0-0.1M	HA31 0-0.1M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05682**	**S16-Se05683**	**S16-Se05684**	**S16-Se05685**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	-
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH*	0.5	mg/kg	-	< 0.5	-	-
2-Fluorobiphenyl (surr.)	1	%	-	75	-	-
p-Terphenyl-d14 (surr.)	1	%	-	85	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	< 100	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
% Moisture	1	%	13	12	18	15
Heavy Metals						
Arsenic	2	mg/kg	3.8	-	8.7	3.8
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	12	-	13	12
Copper	5	mg/kg	10	-	15	11
Lead	5	mg/kg	14	-	38	33
Mercury	0.05	mg/kg	< 0.05	-	0.23	< 0.05
Nickel	5	mg/kg	6.0	-	7.0	5.3
Zinc	5	mg/kg	28	-	50	56

Client Sample ID			HA31 0.2-0.3M	HA32 0-0.5M	HA32 0.4-0.5	QC20160905-01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05686**	**S16-Se05687**	**S16-Se05689**	**S16-Se05690**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	43	-	-
TRH C15-C28	50	mg/kg	-	360	-	-
TRH C29-C36	50	mg/kg	-	310	-	-
TRH C10-36 (Total)	50	mg/kg	-	713	-	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	0.7	-	-
o-Xylene	0.1	mg/kg	-	0.5	-	-
Xylenes - Total	0.3	mg/kg	-	1.2	-	-
4-Bromofluorobenzene (surr.)	1	%	-	81	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	97	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	81	-	93
p-Terphenyl-d14 (surr.)	1	%	-	85	-	78
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-BHC	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-

Client Sample ID			HA31 0.2-0.3M	HA32 0-0.5M	HA32 0.4-0.5	QC20160905-01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05686**	**S16-Se05687**	**S16-Se05689**	**S16-Se05690**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-BHC	0.05	mg/kg	-	< 0.05	-	-
d-BHC	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.2	mg/kg	-	< 0.2	-	-
Toxaphene	1	mg/kg	-	< 1	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	98	-	-
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	int	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	-
Total PCB*	0.5	mg/kg	-	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	-	91	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	97	-	-
TRH >C16-C34	100	mg/kg	-	540	-	-
TRH >C34-C40	100	mg/kg	-	230	-	-
% Moisture	1	%	12	46	13	20

Client Sample ID			HA31 0.2-0.3M	HA32 0-0.5M	HA32 0.4-0.5	QC20160905-01
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se05686**	**S16-Se05687**	**S16-Se05689**	**S16-Se05690**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	5.7	12	4.3	20
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.5	15	8.0	32
Copper	5	mg/kg	13	36	< 5	18
Lead	5	mg/kg	33	33	8.0	16
Mercury	0.05	mg/kg	< 0.05	0.08	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	14	< 5	< 5
Zinc	5	mg/kg	42	110	< 5	27

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 11, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Sep 11, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 11, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
JBS&G Suite 2			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 09, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Organochlorine Pesticides	Sydney	Sep 09, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Sep 09, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Sep 09, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Polychlorinated Biphenyls	Sydney	Sep 09, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Acid Herbicides	Melbourne	Sep 08, 2016	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
pH (1:5 Aqueous extract)	Sydney	Sep 09, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Sep 12, 2016	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Sydney	Sep 07, 2016	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Sep 08, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	Sep 09, 2016	
% Moisture	Sydney	Sep 07, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
External Laboratory																						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	HA17 0-0.10M	Sep 05, 2016		Soil	S16-Se05660							X		X		X		X			X	X			X		
2	HA17 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05661	X																					
3	HA19 0-0.1M	Sep 05, 2016		Soil	S16-Se05662	X								X		X		X				X					
4	HA19 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05663							X						X				X					
5	HA20 0-0.10M	Sep 05, 2016		Soil	S16-Se05664	X																X				X	
6	HA21 0-0.10M	Sep 05, 2016		Soil	S16-Se05665	X						X		X		X	X	X				X					
7	HA21 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05666	X																					
8	HA21 0.4-0.5M	Sep 05, 2016		Soil	S16-Se05667							X										X					
9	HA22 0-0.1m	Sep 05, 2016		Soil	S16-Se05668	X						X						X				X					
10	HA22 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05669		X																				

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Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
11	HA23 0-0.10M	Sep 05, 2016		Soil	S16-Se05670	X								X		X		X			X	X			X		
12	HA23 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05671							X						X				X						
13	HA24 0-0.05M	Sep 05, 2016		Soil	S16-Se05672	X								X		X	X	X				X						
14	HA24 0.1-0.2M	Sep 05, 2016		Soil	S16-Se05673		X																					
15	HA25 0-0.10M	Sep 05, 2016		Soil	S16-Se05674	X																X				X		
16	HA25 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05675													X				X						
17	HA26 0-0.1m	Sep 05, 2016		Soil	S16-Se05676	X						X						X				X						
18	HA26 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05677		X																					
19	HA27 0-0.10M	Sep 05, 2016		Soil	S16-Se05678			X	X	X		X		X		X	X	X			X	X	X		X			
20	HA27 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05679	X																						
21	HA28 0-0.1M	Sep 05, 2016		Soil	S16-Se05680									X		X		X				X						
22	HA28 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05681							X										X						

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Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA29 0-0.1M	Sep 05, 2016		Soil	S16-Se05682	X												X			X	X			X		
24	HA29 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05683							X										X						
25	HA30 0-0.1M	Sep 05, 2016		Soil	S16-Se05684													X			X	X			X			
26	HA31 0-0.1M	Sep 05, 2016		Soil	S16-Se05685													X				X						
27	HA31 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05686													X				X						
28	HA32 0-0.5M	Sep 05, 2016		Soil	S16-Se05687	X											X					X					X	
29	HA32 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05688		X																					
30	HA32 0.4-0.5	Sep 05, 2016		Soil	S16-Se05689													X				X						
31	QC20160905-01	Sep 05, 2016		Soil	S16-Se05690	X						X						X				X						
32	TRIP SPIKE	Sep 05, 2016		Water	S16-Se05691																							X
33	TRIP BLANK	Sep 05, 2016		Water	S16-Se05692																							X

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Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
34	RINSATE	Sep 05, 2016		Water	S16-Se05693						X		X		X		X		X	X				X				
Test Counts						14	4	1	1	1	12	12	8	8	8	8	5	18	1	6	6	24	1	6	6	3	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Ion Exchange Properties							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	95			70-130	Pass	
TRH C10-C14	%	75			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	89			70-130	Pass	
Toluene	%	104			70-130	Pass	
Ethylbenzene	%	104			70-130	Pass	
m&p-Xylenes	%	106			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total	%	106			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	103			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	103			70-130	Pass	
Acenaphthylene	%	88			70-130	Pass	
Anthracene	%	103			70-130	Pass	
Benz(a)anthracene	%	76			70-130	Pass	
Benzo(a)pyrene	%	99			70-130	Pass	
Benzo(b&j)fluoranthene	%	120			70-130	Pass	
Benzo(g.h.i)perylene	%	127			70-130	Pass	
Benzo(k)fluoranthene	%	83			70-130	Pass	
Chrysene	%	95			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	76			70-130	Pass	
Fluorene	%	120			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	127			70-130	Pass	
Naphthalene	%	121			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	82			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	94			70-130	Pass	
4.4'-DDD	%	101			70-130	Pass	
4.4'-DDE	%	98			70-130	Pass	
4.4'-DDT	%	93			70-130	Pass	
a-BHC	%	98			70-130	Pass	
Aldrin	%	96			70-130	Pass	
b-BHC	%	94			70-130	Pass	
d-BHC	%	95			70-130	Pass	
Dieldrin	%	96			70-130	Pass	
Endosulfan I	%	95			70-130	Pass	
Endosulfan II	%	97			70-130	Pass	
Endosulfan sulphate	%	103			70-130	Pass	
Endrin	%	92			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	100			70-130	Pass	
g-BHC (Lindane)	%	98			70-130	Pass	
Heptachlor	%	95			70-130	Pass	
Heptachlor epoxide	%	96			70-130	Pass	
Hexachlorobenzene	%	95			70-130	Pass	
Methoxychlor	%	88			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toxaphene	%	90			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	98			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	118			70-130	Pass	
2.4-DB	%	117			70-130	Pass	
2.4.5-T	%	126			70-130	Pass	
2.4.5-TP	%	94			70-130	Pass	
Actril (loxynil)	%	106			70-130	Pass	
Dicamba	%	93			70-130	Pass	
Dichlorprop	%	106			70-130	Pass	
Dinitro-o-cresol	%	98			70-130	Pass	
Dinoseb	%	117			70-130	Pass	
MCPA	%	105			70-130	Pass	
MCPB	%	109			70-130	Pass	
Mecoprop	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	84			70-130	Pass	
LCS - % Recovery							
Total Organic Carbon	%	102			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			70-130	Pass	
Cadmium	%	99			70-130	Pass	
Chromium	%	98			70-130	Pass	
Copper	%	110			70-130	Pass	
Iron	%	91			70-130	Pass	
Lead	%	113			70-130	Pass	
Mercury	%	94			70-130	Pass	
Nickel	%	101			70-130	Pass	
Zinc	%	99			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Se09392	NCP	%	88			70-130	Pass	
TRH C10-C14	S16-Se03941	NCP	%	73			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Se09392	NCP	%	86			70-130	Pass	
Toluene	S16-Se09392	NCP	%	102			70-130	Pass	
Ethylbenzene	S16-Se09392	NCP	%	106			70-130	Pass	
m&p-Xylenes	S16-Se09392	NCP	%	109			70-130	Pass	
o-Xylene	S16-Se09392	NCP	%	110			70-130	Pass	
Xylenes - Total	S16-Se09392	NCP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Se09392	NCP	%	126			70-130	Pass	
TRH C6-C10	S16-Se09392	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Methoxychlor	S16-Se09262	NCP	%	130			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toxaphene	S16-Se09262	NCP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Se03941	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Se05663	CP	%	98			70-130	Pass	
Chromium	S16-Se05663	CP	%	91			70-130	Pass	
Copper	S16-Se05663	CP	%	129			70-130	Pass	
Lead	S16-Se05663	CP	%	128			70-130	Pass	
Mercury	S16-Se05663	CP	%	90			70-130	Pass	
Nickel	S16-Se05663	CP	%	119			70-130	Pass	
Zinc	S16-Se05663	CP	%	102			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	M16-Se03689	NCP	%	90			70-130	Pass	
Actril (loxynil)	M16-Se03689	NCP	%	86			70-130	Pass	
Dichlorprop	M16-Se03689	NCP	%	93			70-130	Pass	
MCPA	M16-Se03689	NCP	%	84			70-130	Pass	
MCPB	M16-Se03689	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Se05678	CP	%	82			70-130	Pass	
Cadmium	S16-Se05678	CP	%	80			70-130	Pass	
Copper	S16-Se05678	CP	%	128			70-130	Pass	
Lead	S16-Se05678	CP	%	77			70-130	Pass	
Mercury	S16-Se05678	CP	%	107			70-130	Pass	
Nickel	S16-Se05678	CP	%	104			70-130	Pass	
Zinc	S16-Se05678	CP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-Se05680	CP	%	105			70-130	Pass	
4.4'-DDD	S16-Se05680	CP	%	124			70-130	Pass	
4.4'-DDE	S16-Se05680	CP	%	115			70-130	Pass	
4.4'-DDT	S16-Se05680	CP	%	76			70-130	Pass	
a-BHC	S16-Se05680	CP	%	99			70-130	Pass	
Aldrin	S16-Se05680	CP	%	103			70-130	Pass	
b-BHC	S16-Se05680	CP	%	84			70-130	Pass	
d-BHC	S16-Se05680	CP	%	99			70-130	Pass	
Dieldrin	S16-Se05680	CP	%	123			70-130	Pass	
Endosulfan I	S16-Se05680	CP	%	93			70-130	Pass	
Endosulfan II	S16-Se05680	CP	%	84			70-130	Pass	
Endosulfan sulphate	S16-Se05680	CP	%	103			70-130	Pass	
Endrin	S16-Se05680	CP	%	126			70-130	Pass	
Endrin aldehyde	S16-Se05680	CP	%	113			70-130	Pass	
Endrin ketone	S16-Se05680	CP	%	93			70-130	Pass	
g-BHC (Lindane)	S16-Se05680	CP	%	84			70-130	Pass	
Heptachlor	S16-Se05680	CP	%	70			70-130	Pass	
Heptachlor epoxide	S16-Se05680	CP	%	100			70-130	Pass	
Hexachlorobenzene	S16-Se05680	CP	%	97			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S16-Se05680	CP	%	105			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Se05687	CP	%	106			70-130	Pass	
Acenaphthylene	S16-Se05687	CP	%	120			70-130	Pass	
Anthracene	S16-Se05687	CP	%	112			70-130	Pass	
Benz(a)anthracene	S16-Se05687	CP	%	98			70-130	Pass	
Benzo(a)pyrene	S16-Se05687	CP	%	112			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Se05687	CP	%	128			70-130	Pass	
Benzo(g.h.i)perylene	S16-Se05687	CP	%	127			70-130	Pass	
Benzo(k)fluoranthene	S16-Se05687	CP	%	102			70-130	Pass	
Chrysene	S16-Se05687	CP	%	118			70-130	Pass	
Dibenz(a.h)anthracene	S16-Se05687	CP	%	115			70-130	Pass	
Fluoranthene	S16-Se05687	CP	%	104			70-130	Pass	
Fluorene	S16-Se05687	CP	%	125			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se05687	CP	%	124			70-130	Pass	
Naphthalene	S16-Se05687	CP	%	126			70-130	Pass	
Phenanthrene	S16-Se05687	CP	%	110			70-130	Pass	
Pyrene	S16-Se05687	CP	%	105			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S16-Se02767	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Se02767	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Se02767	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Se02767	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Se02767	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Se02767	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Se05662	CP	mg/kg	5.9	6.4	8.0	30%	Pass	
Cadmium	S16-Se05662	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Se05662	CP	mg/kg	7.3	8.1	10	30%	Pass	
Copper	S16-Se05662	CP	mg/kg	10	9.0	12	30%	Pass	
Lead	S16-Se05662	CP	mg/kg	9.3	13	31	30%	Fail	Q15
Mercury	S16-Se05662	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-Se05662	CP	mg/kg	< 5	5.2	23	30%	Pass	
Zinc	S16-Se05662	CP	mg/kg	26	24	11	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Phenanthrene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Se05663	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se05670	CP	%	21	22	5.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Se05676	CP	mg/kg	8.9	9.9	11	30%	Pass	
Cadmium	S16-Se05676	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Se05676	CP	mg/kg	23	24	6.0	30%	Pass	
Copper	S16-Se05676	CP	mg/kg	8.7	8.0	8.0	30%	Pass	
Lead	S16-Se05676	CP	mg/kg	12	13	9.0	30%	Pass	
Mercury	S16-Se05676	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-Se05676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-Se05676	CP	mg/kg	17	15	10	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-Se05678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-Se05678	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-Se05678	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-Se05678	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S16-Se05678	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-Se05678	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	B16-Se05794	NCP	uS/cm	70	87	22	30%	Pass	
pH (1:5 Aqueous extract)	S16-Se09721	NCP	pH Units	5.7	5.6	pass	30%	Pass	
Total Organic Carbon	S16-Se03661	NCP	%	0.7	0.7	3.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Se05683	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se05683	CP	%	12	12	2.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Se05687	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Se05687	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-Se05687	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-Se05687	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-Se05687	CP	mg/kg	0.7	0.8	17	30%	Pass	
o-Xylene	S16-Se05687	CP	mg/kg	0.5	0.6	16	30%	Pass	
Xylenes - Total	S16-Se05687	CP	mg/kg	1.2	1.4	17	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Se05687	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-Se05687	CP	mg/kg	< 20	< 20	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)
Joseph Edouard	Senior Analyst-Organic (VIC)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: **Lindsey Blecher**

Report **514668-W**
Project name MACQUARIE PARK NSW
Project ID 52047
Received Date Sep 06, 2016

Client Sample ID			**TRIP SPIKE**	**TRIP BLANK**	**RINSATE**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se05691**	**S16-Se05692**	**S16-Se05693**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit			
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	74%	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	-	-	< 0.05
TRH C15-C28	0.1	mg/L	-	-	< 0.1
TRH C29-C36	0.1	mg/L	-	-	< 0.1
TRH C10-36 (Total)	0.1	mg/L	-	-	< 0.1
BTEX					
Benzene	0.001	mg/L	81%	< 0.001	< 0.001
Toluene	0.001	mg/L	81%	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	78%	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	76%	< 0.002	< 0.002
o-Xylene	0.001	mg/L	79%	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	77%	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	96	97	130
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH C6-C10	0.02	mg/L	74%	< 0.02	-
Volatile Organics					
Naphthalene[N02]	0.01	mg/L	75%	< 0.01	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	-	-	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	-	< 0.05
TRH C6-C10	0.02	mg/L	-	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	-	< 0.02
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	-	-	< 0.001
Acenaphthylene	0.001	mg/L	-	-	< 0.001
Anthracene	0.001	mg/L	-	-	< 0.001
Benz(a)anthracene	0.001	mg/L	-	-	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	-	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	-	-	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	-	-	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	-	< 0.001
Chrysene	0.001	mg/L	-	-	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	-	-	< 0.001

Client Sample ID			TRIP SPIKE	TRIP BLANK	RINSATE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se05691**	**S16-Se05692**	**S16-Se05693**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Fluoranthene	0.001	mg/L	-	-	< 0.001
Fluorene	0.001	mg/L	-	-	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	-	< 0.001
Naphthalene	0.001	mg/L	-	-	< 0.001
Phenanthrene	0.001	mg/L	-	-	< 0.001
Pyrene	0.001	mg/L	-	-	< 0.001
Total PAH*	0.001	mg/L	-	-	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	-	58
p-Terphenyl-d14 (surr.)	1	%	-	-	73
Organochlorine Pesticides					
Chlordanes - Total	0.001	mg/L	-	-	< 0.001
4.4'-DDD	0.0001	mg/L	-	-	< 0.0001
4.4'-DDE	0.0001	mg/L	-	-	< 0.0001
4.4'-DDT	0.0001	mg/L	-	-	< 0.0001
a-BHC	0.0001	mg/L	-	-	< 0.0001
Aldrin	0.0001	mg/L	-	-	< 0.0001
b-BHC	0.0001	mg/L	-	-	< 0.0001
d-BHC	0.0001	mg/L	-	-	< 0.0001
Dieldrin	0.0001	mg/L	-	-	< 0.0001
Endosulfan I	0.0001	mg/L	-	-	< 0.0001
Endosulfan II	0.0001	mg/L	-	-	< 0.0001
Endosulfan sulphate	0.0001	mg/L	-	-	< 0.0001
Endrin	0.0001	mg/L	-	-	< 0.0001
Endrin aldehyde	0.0001	mg/L	-	-	< 0.0001
Endrin ketone	0.0001	mg/L	-	-	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	-	-	< 0.0001
Heptachlor	0.0001	mg/L	-	-	< 0.0001
Heptachlor epoxide	0.0001	mg/L	-	-	< 0.0001
Hexachlorobenzene	0.0001	mg/L	-	-	< 0.0001
Methoxychlor	0.0001	mg/L	-	-	< 0.0001
Toxaphene	0.01	mg/L	-	-	< 0.01
Dibutylchlorendate (surr.)	1	%	-	-	105
Tetrachloro-m-xylene (surr.)	1	%	-	-	91
Polychlorinated Biphenyls					
Aroclor-1016	0.001	mg/L	-	-	< 0.001
Aroclor-1221	0.001	mg/L	-	-	< 0.001
Aroclor-1232	0.001	mg/L	-	-	< 0.001
Aroclor-1242	0.001	mg/L	-	-	< 0.001
Aroclor-1248	0.001	mg/L	-	-	< 0.001
Aroclor-1254	0.001	mg/L	-	-	< 0.001
Aroclor-1260	0.001	mg/L	-	-	< 0.001
Total PCB*	0.001	mg/L	-	-	<0.001
Dibutylchlorendate (surr.)	1	%	-	-	105
Tetrachloro-m-xylene (surr.)	1	%	-	-	91
Acid Herbicides					
2.4-D	0.001	mg/L	-	-	< 0.001
2.4-DB	0.001	mg/L	-	-	< 0.001
2.4.5-T	0.001	mg/L	-	-	< 0.001
2.4.5-TP	0.001	mg/L	-	-	< 0.001

Client Sample ID			TRIP SPIKE	TRIP BLANK	RINSATE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se05691**	**S16-Se05692**	**S16-Se05693**
Date Sampled			**Sep 05, 2016**	**Sep 05, 2016**	**Sep 05, 2016**
Test/Reference	LOR	Unit			
Acid Herbicides					
Actril (loxynil)	0.001	mg/L	-	-	< 0.001
Dicamba	0.001	mg/L	-	-	< 0.001
Dichlorprop	0.001	mg/L	-	-	< 0.001
Dinitro-o-cresol	0.001	mg/L	-	-	< 0.001
Dinoseb	0.001	mg/L	-	-	< 0.001
MCPA	0.001	mg/L	-	-	< 0.001
MCPB	0.001	mg/L	-	-	< 0.001
Mecoprop	0.001	mg/L	-	-	< 0.001
Warfarin (surr.)	1	%	-	-	int
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	0.05	mg/L	-	-	< 0.05
TRH >C16-C34	0.1	mg/L	-	-	< 0.1
TRH >C34-C40	0.1	mg/L	-	-	< 0.1
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	-	-	< 0.001
Cadmium (filtered)	0.0002	mg/L	-	-	< 0.0002
Chromium (filtered)	0.001	mg/L	-	-	< 0.001
Copper (filtered)	0.001	mg/L	-	-	0.001
Lead (filtered)	0.001	mg/L	-	-	< 0.001
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001
Nickel (filtered)	0.001	mg/L	-	-	0.001
Zinc (filtered)	0.001	mg/L	-	-	0.006

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH C6-C10 less BTEX (F1)	Melbourne	Sep 07, 2016	14 Day
- Method: LM-LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 11, 2016	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Sep 11, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 11, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Sydney	Sep 11, 2016	7 Day
- Method: E016 Volatile Organic Compounds (VOC)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
JBS&G Suite 2			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 08, 2016	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Sep 08, 2016	7 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 08, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polychlorinated Biphenyls	Melbourne	Sep 08, 2016	7 Days
- Method: USEPA 8082 Polychlorinated Biphenyls			
Acid Herbicides	Melbourne	Sep 08, 2016	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Metals M8 filtered	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
External Laboratory																						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	HA17 0-0.10M	Sep 05, 2016		Soil	S16-Se05660						X		X		X		X			X	X			X		
2	HA17 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05661	X																			
3	HA19 0-0.1M	Sep 05, 2016		Soil	S16-Se05662	X								X		X		X				X			
4	HA19 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05663							X						X				X			
5	HA20 0-0.10M	Sep 05, 2016		Soil	S16-Se05664	X																X			X
6	HA21 0-0.10M	Sep 05, 2016		Soil	S16-Se05665	X						X		X		X	X	X				X			
7	HA21 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05666	X																			
8	HA21 0.4-0.5M	Sep 05, 2016		Soil	S16-Se05667							X										X			
9	HA22 0-0.1m	Sep 05, 2016		Soil	S16-Se05668	X						X						X				X			
10	HA22 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05669		X																		

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Address: Level 1, 50 Margaret St
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Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
11	HA23 0-0.10M	Sep 05, 2016		Soil	S16-Se05670	X								X		X		X			X	X			X		
12	HA23 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05671							X						X				X						
13	HA24 0-0.05M	Sep 05, 2016		Soil	S16-Se05672	X								X		X	X	X				X						
14	HA24 0.1-0.2M	Sep 05, 2016		Soil	S16-Se05673		X																					
15	HA25 0-0.10M	Sep 05, 2016		Soil	S16-Se05674	X																X				X		
16	HA25 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05675													X				X						
17	HA26 0-0.1m	Sep 05, 2016		Soil	S16-Se05676	X						X						X				X						
18	HA26 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05677		X																					
19	HA27 0-0.10M	Sep 05, 2016		Soil	S16-Se05678			X	X	X		X		X		X	X	X			X	X	X		X			
20	HA27 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05679	X																						
21	HA28 0-0.1M	Sep 05, 2016		Soil	S16-Se05680									X		X		X				X						
22	HA28 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05681							X										X						

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
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NSW 2000

Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA29 0-0.1M	Sep 05, 2016		Soil	S16-Se05682	X												X			X	X			X		
24	HA29 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05683							X										X						
25	HA30 0-0.1M	Sep 05, 2016		Soil	S16-Se05684													X			X	X			X			
26	HA31 0-0.1M	Sep 05, 2016		Soil	S16-Se05685													X				X						
27	HA31 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05686													X				X						
28	HA32 0-0.5M	Sep 05, 2016		Soil	S16-Se05687	X											X					X					X	
29	HA32 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05688		X																					
30	HA32 0.4-0.5	Sep 05, 2016		Soil	S16-Se05689													X				X						
31	QC20160905-01	Sep 05, 2016		Soil	S16-Se05690	X						X						X				X						
32	TRIP SPIKE	Sep 05, 2016		Water	S16-Se05691																							X
33	TRIP BLANK	Sep 05, 2016		Water	S16-Se05692																							X

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Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
34	RINSATE	Sep 05, 2016		Water	S16-Se05693						X		X		X		X		X	X				X				
Test Counts						14	4	1	1	1	12	12	8	8	8	8	5	18	1	6	6	24	1	6	6	3	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Volatile Organics							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	<0.001			0.001	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/L	< 0.001			0.001	Pass	
2.4-DB	mg/L	< 0.001			0.001	Pass	
2.4.5-T	mg/L	< 0.001			0.001	Pass	
2.4.5-TP	mg/L	< 0.001			0.001	Pass	
Actril (loxynil)	mg/L	< 0.001			0.001	Pass	
Dicamba	mg/L	< 0.001			0.001	Pass	
Dichlorprop	mg/L	< 0.001			0.001	Pass	
Dinitro-o-cresol	mg/L	< 0.001			0.001	Pass	
Dinoseb	mg/L	< 0.001			0.001	Pass	
MCPA	mg/L	< 0.001			0.001	Pass	
MCPB	mg/L	< 0.001			0.001	Pass	
Mecoprop	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	126			70-130	Pass	
TRH C10-C14	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzene	%	119			70-130	Pass	
Toluene	%	120			70-130	Pass	
Ethylbenzene	%	115			70-130	Pass	
m&p-Xylenes	%	114			70-130	Pass	
Xylenes - Total	%	114			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	123			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
Naphthalene	%	121			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	75			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	72			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	73			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a.h)anthracene	%	103			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	96			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
Phenanthrene	%	82			70-130	Pass	
Pyrene	%	74			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	74			70-130	Pass	
4.4'-DDE	%	92			70-130	Pass	
4.4'-DDT	%	74			70-130	Pass	
a-BHC	%	95			70-130	Pass	
Aldrin	%	86			70-130	Pass	
b-BHC	%	89			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	130			70-130	Pass	
Endosulfan I	%	103			70-130	Pass	
Endosulfan II	%	94			70-130	Pass	
Endosulfan sulphate	%	78			70-130	Pass	
Endrin	%	105			70-130	Pass	
Endrin aldehyde	%	70			70-130	Pass	
Endrin ketone	%	75			70-130	Pass	
g-BHC (Lindane)	%	99			70-130	Pass	
Heptachlor	%	73			70-130	Pass	
Heptachlor epoxide	%	83			70-130	Pass	
Hexachlorobenzene	%	95			70-130	Pass	
Methoxychlor	%	102			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	98			70-130	Pass	
2.4-DB	%	70			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.5-T	%	104			70-130	Pass	
2.4.5-TP	%	99			70-130	Pass	
Actril (loxynil)	%	72			70-130	Pass	
Dicamba	%	101			70-130	Pass	
Dichlorprop	%	97			70-130	Pass	
Dinitro-o-cresol	%	70			70-130	Pass	
Dinoseb	%	89			70-130	Pass	
MCPA	%	74			70-130	Pass	
MCPB	%	79			70-130	Pass	
Mecoprop	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	88			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	91			80-120	Pass	
Cadmium (filtered)	%	95			80-120	Pass	
Chromium (filtered)	%	91			80-120	Pass	
Copper (filtered)	%	91			80-120	Pass	
Lead (filtered)	%	92			80-120	Pass	
Mercury (filtered)	%	86			70-130	Pass	
Nickel (filtered)	%	91			80-120	Pass	
Zinc (filtered)	%	92			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M16-Se06458	NCP	%	122			70-130	Pass	
TRH C10-C14	S16-Se07227	NCP	%	95			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M16-Se06458	NCP	%	127			70-130	Pass	
Toluene	M16-Se06458	NCP	%	127			70-130	Pass	
Ethylbenzene	M16-Se06458	NCP	%	129			70-130	Pass	
m&p-Xylenes	M16-Se06458	NCP	%	126			70-130	Pass	
o-Xylene	M16-Se06458	NCP	%	126			70-130	Pass	
Xylenes - Total	M16-Se06458	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	M16-Se06458	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Naphthalene	M16-Se06458	NCP	%	128			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M16-Se06956	NCP	%	99			70-130	Pass	
Acenaphthylene	M16-Se06956	NCP	%	117			70-130	Pass	
Anthracene	M16-Se06956	NCP	%	109			70-130	Pass	
Benz(a)anthracene	M16-Se06956	NCP	%	119			70-130	Pass	
Benzo(a)pyrene	M16-Se06956	NCP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	M16-Se06956	NCP	%	104			70-130	Pass	
Benzo(g.h.i)perylene	M16-Se06956	NCP	%	95			70-130	Pass	
Benzo(k)fluoranthene	M16-Se06956	NCP	%	91			70-130	Pass	
Chrysene	M16-Se06956	NCP	%	75			70-130	Pass	
Dibenz(a.h)anthracene	M16-Se06956	NCP	%	118			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	M16-Se06956	NCP	%	106			70-130	Pass	
Fluorene	M16-Se06956	NCP	%	113			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se06956	NCP	%	110			70-130	Pass	
Naphthalene	M16-Se06956	NCP	%	76			70-130	Pass	
Phenanthrene	M16-Se06956	NCP	%	92			70-130	Pass	
Pyrene	M16-Se06956	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M16-Se05365	NCP	%	74			70-130	Pass	
4.4'-DDE	M16-Se05365	NCP	%	76			70-130	Pass	
4.4'-DDT	M16-Se05365	NCP	%	78			70-130	Pass	
a-BHC	M16-Se05365	NCP	%	89			70-130	Pass	
Aldrin	M16-Se05499	NCP	%	93			70-130	Pass	
b-BHC	M16-Se05365	NCP	%	84			70-130	Pass	
d-BHC	M16-Se05365	NCP	%	86			70-130	Pass	
Dieldrin	M16-Se05365	NCP	%	118			70-130	Pass	
Endosulfan I	M16-Se05365	NCP	%	74			70-130	Pass	
Endosulfan II	M16-Se05365	NCP	%	84			70-130	Pass	
Endosulfan sulphate	M16-Se05365	NCP	%	79			70-130	Pass	
Endrin	M16-Se05365	NCP	%	95			70-130	Pass	
Endrin aldehyde	M16-Se05365	NCP	%	77			70-130	Pass	
Endrin ketone	M16-Se05365	NCP	%	80			70-130	Pass	
g-BHC (Lindane)	M16-Se05365	NCP	%	97			70-130	Pass	
Heptachlor	M16-Se05499	NCP	%	72			70-130	Pass	
Heptachlor epoxide	M16-Se05365	NCP	%	75			70-130	Pass	
Hexachlorobenzene	M16-Se05499	NCP	%	119			70-130	Pass	
Methoxychlor	M16-Se05365	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	B16-Au24551	NCP	%	102			70-130	Pass	
Actril (loxynil)	B16-Au24551	NCP	%	93			70-130	Pass	
Dichlorprop	B16-Au24551	NCP	%	102			70-130	Pass	
MCPA	B16-Au24551	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Se07227	NCP	%	95			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	A16-Se04110	NCP	%	94			70-130	Pass	
Cadmium (filtered)	A16-Se04110	NCP	%	91			70-130	Pass	
Chromium (filtered)	A16-Se04110	NCP	%	90			70-130	Pass	
Copper (filtered)	A16-Se04110	NCP	%	86			70-130	Pass	
Lead (filtered)	A16-Se04110	NCP	%	88			70-130	Pass	
Mercury (filtered)	A16-Se04110	NCP	%	106			70-130	Pass	
Nickel (filtered)	A16-Se04110	NCP	%	87			70-130	Pass	
Zinc (filtered)	A16-Se04110	NCP	%	88			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	B16-Se05638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S16-Se07226	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S16-Se07226	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S16-Se07226	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	B16-Se05638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	B16-Se05638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	B16-Se05638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	B16-Se05638	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	B16-Se05638	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	B16-Se05638	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C10	B16-Se05638	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Naphthalene	B16-Se05638	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	M16-Se05364	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1221	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1232	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1242	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1248	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1254	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1260	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total PCB*	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Se07226	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S16-Se07226	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S16-Se07226	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	A16-Se04110	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium (filtered)	A16-Se04110	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	A16-Se04110	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	A16-Se04110	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	A16-Se04110	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	A16-Se04110	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	A16-Se04110	NCP	mg/L	0.004	0.004	4.0	30%	Pass	
Zinc (filtered)	A16-Se04110	NCP	mg/L	0.001	0.001	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Lindsey Blecher
Report	514668-AID
Project Name	MACQUARIE PARK NSW
Project ID	52047
Received Date	Sep 06, 2016
Date Reported	Sep 13, 2016

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name MACQUARIE PARK NSW
Project ID 52047
Date Sampled Sep 05, 2016
Report 514668-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA17 0.2-0.3M	16-Se05661	Sep 05, 2016	Approximate Sample 372g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA19 0-0.1M	16-Se05662	Sep 05, 2016	Approximate Sample 535g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA20 0-0.10M	16-Se05664	Sep 05, 2016	Approximate Sample 407g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA21 0-0.10M	16-Se05665	Sep 05, 2016	Approximate Sample 528g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA21 0.2-0.3M	16-Se05666	Sep 05, 2016	Approximate Sample 619g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA22 0-0.1m	16-Se05668	Sep 05, 2016	Approximate Sample 528g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA23 0-0.10M	16-Se05670	Sep 05, 2016	Approximate Sample 409g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA24 0-0.05M	16-Se05672	Sep 05, 2016	Approximate Sample 400g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA25 0-0.10M	16-Se05674	Sep 05, 2016	Approximate Sample 519g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA26 0-0.1m	16-Se05676	Sep 05, 2016	Approximate Sample 446g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA27 0.2-0.3M	16-Se05679	Sep 05, 2016	Approximate Sample 688g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA29 0-0.1M	16-Se05682	Sep 05, 2016	Approximate Sample 647g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA32 0-0.5M	16-Se05687	Sep 05, 2016	Approximate Sample 283g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
QC20160905-01	16-Se05690	Sep 05, 2016	Approximate Sample 355g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 09, 2016	Indefinite

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail	Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
External Laboratory																						

No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																		
1	HA17 0-0.10M	Sep 05, 2016		Soil	S16-Se05660						X		X		X		X			X	X			X		
2	HA17 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05661	X																			
3	HA19 0-0.1M	Sep 05, 2016		Soil	S16-Se05662	X								X		X		X				X			
4	HA19 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05663							X						X				X			
5	HA20 0-0.10M	Sep 05, 2016		Soil	S16-Se05664	X																X			X
6	HA21 0-0.10M	Sep 05, 2016		Soil	S16-Se05665	X						X		X		X	X	X				X			
7	HA21 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05666	X																			
8	HA21 0.4-0.5M	Sep 05, 2016		Soil	S16-Se05667							X										X			
9	HA22 0-0.1m	Sep 05, 2016		Soil	S16-Se05668	X						X						X				X			
10	HA22 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05669		X																		

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Address: Level 1, 50 Margaret St
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Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																											
External Laboratory																											
11	HA23 0-0.10M	Sep 05, 2016		Soil	S16-Se05670	X								X		X		X			X	X			X		
12	HA23 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05671							X						X				X					
13	HA24 0-0.05M	Sep 05, 2016		Soil	S16-Se05672	X								X		X	X	X				X					
14	HA24 0.1-0.2M	Sep 05, 2016		Soil	S16-Se05673		X																				
15	HA25 0-0.10M	Sep 05, 2016		Soil	S16-Se05674	X																X				X	
16	HA25 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05675													X				X					
17	HA26 0-0.1m	Sep 05, 2016		Soil	S16-Se05676	X						X						X				X					
18	HA26 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05677		X																				
19	HA27 0-0.10M	Sep 05, 2016		Soil	S16-Se05678			X	X	X		X		X		X	X	X			X	X	X		X		
20	HA27 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05679	X																					
21	HA28 0-0.1M	Sep 05, 2016		Soil	S16-Se05680									X		X		X				X					
22	HA28 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05681							X										X					

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK NSW
Project ID: 52047

Order No.:
Report #: 514668
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 3:45 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271										X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA29 0-0.1M	Sep 05, 2016		Soil	S16-Se05682	X												X			X	X			X		
24	HA29 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05683							X										X						
25	HA30 0-0.1M	Sep 05, 2016		Soil	S16-Se05684													X			X	X			X			
26	HA31 0-0.1M	Sep 05, 2016		Soil	S16-Se05685													X				X						
27	HA31 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05686													X				X						
28	HA32 0-0.5M	Sep 05, 2016		Soil	S16-Se05687	X											X					X					X	
29	HA32 0.2-0.3M	Sep 05, 2016		Soil	S16-Se05688		X																					
30	HA32 0.4-0.5	Sep 05, 2016		Soil	S16-Se05689													X				X						
31	QC20160905-01	Sep 05, 2016		Soil	S16-Se05690	X						X						X				X						
32	TRIP SPIKE	Sep 05, 2016		Water	S16-Se05691																							X
33	TRIP BLANK	Sep 05, 2016		Water	S16-Se05692																							X

eurofins | mgt

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

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Oakleigh VIC 3166
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NATA # 1261
Site # 1254 & 14271

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
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Project Name: MACQUARIE PARK NSW
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Contact Name: Lindsey Blecher

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Sample Detail	Asbestos - WA guidelines	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271					X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																						
External Laboratory																						
34 RINSATE Sep 05, 2016 Water S16-Se05693						X		X		X		X		X	X				X			
Test Counts	14	4	1	1	1	12	12	8	8	8	8	5	18	1	6	6	24	1	6	6	3	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Samples Se05661, Se05664, Se05670, Se05672, Se05676, Se05687 and Se05690 received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047
PROJECT NAME: Macquarie Park, NSW
DATE NEEDED BY: STD TAT

LABORATORY BATCH NO.: 514702
SAMPLERS: Alex Finney, Lindsay Blecher
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) LBlecher@jbsg.com.au; (3) afinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Heavy Metals	PAH	TRH / BTEX	Asbestos	OCPs / PCBs	Herbicides	OmPe, CEC, pH	ASLP / TCLP	3B2A	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1.	HA01 0.0-0.1m	Soil	06/09	—	Jar, Bag, Ice		X	X	X	X	X	X			X			
2.	HA01 0.3-0.4m			—			X											
3.	HA02 0.0-0.05m			—			X	X	X	X	X				X			
	HA02 0.2-0.3m			—			X											
5.	HA03 0.0-0.1m			—			X	X		X			X					
6.	HA04 0.0-0.1m			—			X		X	X	X	X						
7.	HA04 0.2-0.3m			—				X										
8.	HA05 0.0-0.1m			—			X	X		X	X							
9.	HA05 0.3-0.4m			—						X								
10.	HA06 0.0-0.10m			—			X	X	X	X								
	HA06 0.3-0.4m			—														
12.	HA07 0.0-0.1m			—			X	X	X									
	HA07 0.2-0.3m			—						X								
	HA08 0.0-0.1m			—			X	X		X								
	HA09 0.0-0.1m			—			X	X	X	X	X				X			
16.	HA10 0.0-0.1m			—			X	X										
	HA10 0.2-0.3m			—				X										
18.	HA11 0.0-0.1m			—			X	X	X	X	X							
	HA11 0.3-0.4m			—			X	X										

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE: 06/09	CONSIGNMENT NOTE NO.	NAME: Sivanesh DATE: 6.9.16	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF: ESMST 17:25	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: S2047	LABORATORY BATCH NO.:
PROJECT NAME: Macquarie Park, NSW	SAMPLERS: AF + LB
DATE NEEDED BY: STD TAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) LBrecher@jbsg.com.au; (3) afinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Heavy Metals	PAH	TRH/BTEX	Asbestos	OCPs/PCBs	Herbicides	OM, Fe, CEC, pH	ASLP/TCLP	JB2A	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
20	HA12 0.0-0.1m	Soil	06/09	–	~~Glass~~, Jar, Bag, Ice		X	X		X	X							
	HA12 0.3-0.4m			–														
22	HA13 0.0-0.1m			–			X	X		X	X	X						
23	HA14 0.0-0.1m			–			X	X										
	HA14 0.2-0.3m			–						X								
25	HA15 0.0-0.1m			–			X	X	X	X	X				X			
	HA15 0.2-0.3m			–						X								
27	HA16 0.0-0.1m			–			X	X			X	X						
	HA16 0.2-0.3m			–						X								
29	HA18 0.0-0.05m			–			X	X	X	X								
	HA18 0.2-0.3m			–						X								
	QC20160906-01			–			X	X		X			X					
	TB/TS	Water		–	Vial, Ice				X									
	Rinsate	Water		–	VB, B, N, Ice		X	X	X		X	X						

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE: 06/09.	CONSIGNMENT NO.	NAME: SS	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 6.9.16	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Sean 7/9 3:07pm

514702

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Wednesday, 7 September 2016 3:09 PM
To: Nibha Vaidya
Cc: Alex Finney
Subject: RE: 52047 CoC Schedule

Hi Nibha,

See my comments below:

Missing:
HA18 0.0-0.05

Could you please have another look for this jar, we believe we sent it.

Extra:
HA18 0.0-0.1 (bag only)

This is the bag for HA 0.0-0.05, label as per COC.

Labelling Discrepancies:
COC - HA14 0.2-0.3m; Jar/bag - HA14 0.1-0.2m

Label as per COC

Thanks Nibha. Sorry for the hassle.

Lindsey

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Wednesday, 7 September 2016 2:55 PM
To: Lindsey Blecher <LBlecher@jbsg.com.au>
Cc: Alex Finney <AFinney@jbsg.com.au>
Subject: RE: 52047 CoC Schedule

Hi Lindsey,

There are a few discrepancies in this job –

Missing:
HA18 0.0-0.5

Extra:
HA18 0.0-0.1 (bag only)

Labelling Discrepancies:
COC - HA14 0.2-0.3m; Jar/bag - HA14 0.1-0.2m

Would you be able to address these please?

Thanks,
Nibha

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

Siamak Sobhanei

From: Nibha Vaidya
Sent: Friday, 9 September 2016 11:37 AM
To: !AU04_CAU001_EnviroSampleNSW
Subject: FW: 52047 CoC Schedule

FYI

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Friday, 9 September 2016 10:19 AM
To: Nibha Vaidya
Cc: Alex Finney
Subject: RE: 52047 CoC Schedule

Hi Nibha,

OK, thanks for checking. Please cancel the chemical analyses for HA18 0.0-0.05, and continue with asbestos analysis for this sample.

Could you please schedule HA18 0.2-0.3 for Heavy Metals, PAHs, TRH/BTEX, and please continue with asbestos analysis for this sample.

Thanks,

Lindsey

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Friday, 9 September 2016 10:09 AM
To: Lindsey Blecher <LBlecher@jbsg.com.au>
Cc: Alex Finney <AFinney@jbsg.com.au>
Subject: RE: 52047 CoC Schedule

Hi Lindsey,

We have gone through these samples again and did not find any jar for 'HA18 0.0-0.05'. Could it be misplaced or labelled differently perhaps?

Regards
Nibha

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

eurofins | mgt

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW & WA) P/L**
Contact name:	Lindsey Blecher
Project name:	MACQUARIE PARK
Project ID:	52047
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 6, 2016 5:25 PM
Eurofins | mgt reference:	**514702**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

HA18 0.0-0.5 was missing (bag and jar), however 1x extra sample was received, HA18 0.0-0.1 (bag only)| Labelling discrepancy: COC-HA14 0.2-0.3, Jar/bag HA14 0.1-0.2. We have labelled as per the COC

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Lindsey Blecher - LBlecher@jbsg.com.au.

eurofins | mgt

Certificate of Analysis

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Lindsey Blecher**

Report **514702-S**
Project name MACQUARIE PARK
Project ID 52047
Received Date Sep 06, 2016

Client Sample ID			**HA01 0.0-0.1M**	**HA01 0.3-0.4M**	**HA02 0.0-0.05M**	**HA02 0.2-0.3M**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06143**	**S16-Se06144**	**S16-Se06145**	**S16-Se06146**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	51	-
TRH C29-C36	50	mg/kg	< 50	-	82	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	133	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	71	-	77	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			HA01 0.0-0.1M	HA01 0.3-0.4M	HA02 0.0-0.05M	HA02 0.2-0.3M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06143**	**S16-Se06144**	**S16-Se06145**	**S16-Se06146**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	84	-	74	-
p-Terphenyl-d14 (surr.)	1	%	109	-	89	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	112	-	109	-
Tetrachloro-m-xylene (surr.)	1	%	110	-	102	-
Acid Herbicides						
2.4-D	0.5	mg/kg	< 0.5	-	-	-
2.4-DB	0.5	mg/kg	< 0.5	-	-	-
2.4.5-T	0.5	mg/kg	< 0.5	-	-	-
2.4.5-TP	0.5	mg/kg	< 0.5	-	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-	-
MCPA	0.5	mg/kg	< 0.5	-	-	-
MCPB	0.5	mg/kg	< 0.5	-	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-	-
Warfarin (surr.)	1	%	75	-	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			HA01 0.0-0.1M	HA01 0.3-0.4M	HA02 0.0-0.05M	HA02 0.2-0.3M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06143**	**S16-Se06144**	**S16-Se06145**	**S16-Se06146**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls (PCB)						
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	112	-	109	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	120	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
% Moisture	1	%	13	9.2	39	17
Heavy Metals						
Arsenic	2	mg/kg	14	8.3	9.1	11
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	13	9.9	29
Copper	5	mg/kg	23	12	16	8.9
Lead	5	mg/kg	47	27	45	38
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	5.1	< 5	< 5
Zinc	5	mg/kg	41	17	45	36

Client Sample ID			HA03 0.0-0.1M	HA04 0.0-0.1M	HA04 0.2-0.3M	HA03 0.0-0.1M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06147**	**S16-Se06148**	**S16-Se06149**	**S16-Se06150**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	-	73	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA03 0.0-0.1M Soil S16-Se06147 Sep 06, 2016	HA04 0.0-0.1M Soil S16-Se06148 Sep 06, 2016	HA04 0.2-0.3M Soil S16-Se06149 Sep 06, 2016	HA03 0.0-0.1M Soil S16-Se06150 Sep 06, 2016
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	82	-	80	89
p-Terphenyl-d14 (surr.)	1	%	88	-	80	91
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	-	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	-	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	-	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	-	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	-	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	-	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	-	125	-	141
Tetrachloro-m-xylene (surr.)	1	%	-	113	-	128

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA03 0.0-0.1M Soil S16-Se06147 Sep 06, 2016	HA04 0.0-0.1M Soil S16-Se06148 Sep 06, 2016	HA04 0.2-0.3M Soil S16-Se06149 Sep 06, 2016	HA03 0.0-0.1M Soil S16-Se06150 Sep 06, 2016
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	125	-	141
Tetrachloro-m-xylene (surr.)	1	%	-	113	-	128
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	78	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	39	-	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	5.6	-	-	-
Total Organic Carbon	0.1	%	2.5	-	-	-
% Moisture	1	%	17	12	9.3	24
Heavy Metals						
Arsenic	2	mg/kg	6.9	10	-	3.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	10	33	-	6.7
Copper	5	mg/kg	18	24	-	9.0
Iron	20	mg/kg	26000	-	-	-
Lead	5	mg/kg	19	18	-	16
Mercury	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Nickel	5	mg/kg	16	37	-	< 5
Zinc	5	mg/kg	53	45	-	47
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	12	-	-	-

Client Sample ID			HA06 0.0-0.1M	HA07 0.0-0.1M	HA08 0.0-0.1M	HA09 0.0-0.1M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se06152	S16-Se06154	S16-Se06156	S16-Se06157
Date Sampled			Sep 06, 2016	Sep 06, 2016	Sep 06, 2016	Sep 06, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	33
TRH C15-C28	50	mg/kg	-	< 50	-	91
TRH C29-C36	50	mg/kg	-	59	-	68
TRH C10-36 (Total)	50	mg/kg	-	59	-	192
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	76	-	76
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	101	113	102	103
p-Terphenyl-d14 (surr.)	1	%	101	116	108	114
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	-	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	-	< 0.05
a-BHC	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
b-BHC	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA06 0.0-0.1M Soil S16-Se06152 Sep 06, 2016	HA07 0.0-0.1M Soil S16-Se06154 Sep 06, 2016	HA08 0.0-0.1M Soil S16-Se06156 Sep 06, 2016	HA09 0.0-0.1M Soil S16-Se06157 Sep 06, 2016
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Toxaphene	1	mg/kg	-	-	-	< 1
Dibutylchlorendate (surr.)	1	%	-	-	-	113
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	109
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	113
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	150
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
% Moisture	1	%	8.4	9.1	4.0	9.7
Heavy Metals						
Arsenic	2	mg/kg	9.0	4.5	4.2	2.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	25	9.3	5.1	12
Copper	5	mg/kg	38	7.3	< 5	< 5
Lead	5	mg/kg	31	13	11	5.4
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	40	5.4	< 5	< 5
Zinc	5	mg/kg	73	47	< 5	< 5

Client Sample ID			HA10 0.0-0.1M	HA10 0.2-0.3M	HA11 0.0-0.1M	HA11 0.3-0.4M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06158**	**S16-Se06159**	**S16-Se06160**	**S16-Se06161**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	54	-
TRH C29-C36	50	mg/kg	-	-	63	-
TRH C10-36 (Total)	50	mg/kg	-	-	117	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	73	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	103	102	103	94
p-Terphenyl-d14 (surr.)	1	%	104	104	105	93
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
b-BHC	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA10 0.0-0.1M Soil S16-Se06158 Sep 06, 2016	HA10 0.2-0.3M Soil S16-Se06159 Sep 06, 2016	HA11 0.0-0.1M Soil S16-Se06160 Sep 06, 2016	HA11 0.3-0.4M Soil S16-Se06161 Sep 06, 2016
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	117	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	114	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	117	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	114	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
% Moisture	1	%	22	13	21	10
Heavy Metals						
Arsenic	2	mg/kg	4.8	-	6.8	5.5
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	11	-	8.7	6.5
Copper	5	mg/kg	30	-	15	6.3
Lead	5	mg/kg	45	-	22	8.7
Mercury	0.05	mg/kg	< 0.05	-	< 0.05	< 0.05
Nickel	5	mg/kg	11	-	10.0	5.1
Zinc	5	mg/kg	63	-	45	12

Client Sample ID			HA12 0.0-0.1M	HA13 0.0-0.1M	HA14 0.0-0.1M	HA15 0.0-0.1M
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S16-Se06162	S16-Se06164	S16-Se06165	S16-Se06167
Date Sampled			Sep 06, 2016	Sep 06, 2016	Sep 06, 2016	Sep 06, 2016
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	27
TRH C15-C28	50	mg/kg	-	-	-	380
TRH C29-C36	50	mg/kg	-	-	-	450
TRH C10-36 (Total)	50	mg/kg	-	-	-	857
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	0.5
o-Xylene	0.1	mg/kg	-	-	-	0.2
Xylenes - Total	0.3	mg/kg	-	-	-	0.8
4-Bromofluorobenzene (surr.)	1	%	-	-	-	75
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	110
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	90	91	91	104
p-Terphenyl-d14 (surr.)	1	%	93	94	94	102
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	HA12 0.0-0.1M Soil S16-Se06162 Sep 06, 2016	HA13 0.0-0.1M Soil S16-Se06164 Sep 06, 2016	HA14 0.0-0.1M Soil S16-Se06165 Sep 06, 2016	HA15 0.0-0.1M Soil S16-Se06167 Sep 06, 2016
Organochlorine Pesticides						
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	102	123	-	89
Tetrachloro-m-xylene (surr.)	1	%	117	115	-	103
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	102	123	-	-
Tetrachloro-m-xylene (surr.)	1	%	117	115	-	-
Acid Herbicides						
2.4-D	0.5	mg/kg	-	< 0.5	-	-
2.4-DB	0.5	mg/kg	-	< 0.5	-	-
2.4.5-T	0.5	mg/kg	-	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	-	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	-	< 0.5	-	-
Dicamba	0.5	mg/kg	-	< 0.5	-	-
Dichlorprop	0.5	mg/kg	-	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	-	< 0.5	-	-
Dinoseb	0.5	mg/kg	-	< 0.5	-	-
MCPA	0.5	mg/kg	-	< 0.5	-	-
MCPB	0.5	mg/kg	-	< 0.5	-	-
Mecoprop	0.5	mg/kg	-	< 0.5	-	-
Warfarin (surr.)	1	%	-	76	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB*	0.5	mg/kg	-	-	-	< 0.5
Dibutylchlorendate (surr.)	1	%	-	-	-	89

Client Sample ID			HA12 0.0-0.1M	HA13 0.0-0.1M	HA14 0.0-0.1M	HA15 0.0-0.1M
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06162**	**S16-Se06164**	**S16-Se06165**	**S16-Se06167**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	-	110
TRH >C16-C34	100	mg/kg	-	-	-	440
TRH >C34-C40	100	mg/kg	-	-	-	380
% Moisture	1	%	16	8.5	10	17
Heavy Metals						
Arsenic	2	mg/kg	9.3	9.2	11	9.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	15	11	78	26
Copper	5	mg/kg	20	5.5	22	15
Lead	5	mg/kg	22	9.0	16	17
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	13	< 5	58	24
Zinc	5	mg/kg	32	14	32	50

Client Sample ID			HA16 0.0-0.1M	HA18 0.2-0.3M	QC20160906-01
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06169**	**S16-Se06172**	**S16-Se06173**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	20	mg/kg	-	< 20	-
TRH C10-C14	20	mg/kg	-	< 20	-
TRH C15-C28	50	mg/kg	-	< 50	-
TRH C29-C36	50	mg/kg	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	< 50	-
BTEX					
Benzene	0.1	mg/kg	-	< 0.1	-
Toluene	0.1	mg/kg	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	74	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-
TRH C6-C10	20	mg/kg	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5

Client Sample ID			HA16 0.0-0.1M	HA18 0.2-0.3M	QC20160906-01
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06169**	**S16-Se06172**	**S16-Se06173**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	92	101	96
p-Terphenyl-d14 (surr.)	1	%	92	101	95
Organochlorine Pesticides					
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-
Toxaphene	1	mg/kg	< 1	-	-
Dibutylchlorendate (surr.)	1	%	106	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-
Polychlorinated Biphenyls					
Aroclor-1016	0.5	mg/kg	< 0.5	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-
Dibutylchlorendate (surr.)	1	%	106	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-

Client Sample ID			HA16 0.0-0.1M	HA18 0.2-0.3M	QC20160906-01
Sample Matrix			**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S16-Se06169**	**S16-Se06172**	**S16-Se06173**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
Acid Herbicides					
2.4-D	0.5	mg/kg	< 0.5	-	-
2.4-DB	0.5	mg/kg	< 0.5	-	-
2.4.5-T	0.5	mg/kg	< 0.5	-	-
2.4.5-TP	0.5	mg/kg	< 0.5	-	-
Actril (loxynil)	0.5	mg/kg	< 0.5	-	-
Dicamba	0.5	mg/kg	< 0.5	-	-
Dichlorprop	0.5	mg/kg	< 0.5	-	-
Dinitro-o-cresol	0.5	mg/kg	< 0.5	-	-
Dinoseb	0.5	mg/kg	< 0.5	-	-
MCPA	0.5	mg/kg	< 0.5	-	-
MCPB	0.5	mg/kg	< 0.5	-	-
Mecoprop	0.5	mg/kg	< 0.5	-	-
Warfarin (surr.)	1	%	71	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	50	mg/kg	-	< 50	-
TRH >C16-C34	100	mg/kg	-	< 100	-
TRH >C34-C40	100	mg/kg	-	< 100	-
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	-	38
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	6.3
Total Organic Carbon	0.1	%	-	-	2.3
% Moisture	1	%	27	18	14
Heavy Metals					
Arsenic	2	mg/kg	< 2	4.9	7.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	< 5	13	14
Copper	5	mg/kg	6.4	< 5	20
Iron	20	mg/kg	-	-	15000
Lead	5	mg/kg	< 5	7.3	20
Mercury	0.05	mg/kg	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	< 5	< 5	17
Zinc	5	mg/kg	12	9.2	57
Ion Exchange Properties					
Cation Exchange Capacity	0.05	meq/100g	-	-	11

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Sep 09, 2016	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Sep 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
JBS&G Suite 2			
Polycyclic Aromatic Hydrocarbons	Sydney	Sep 09, 2016	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Organochlorine Pesticides	Sydney	Sep 09, 2016	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
Polychlorinated Biphenyls (PCB)	Sydney	Sep 09, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 09, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	Sep 09, 2016	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Polychlorinated Biphenyls	Sydney	Sep 09, 2016	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Acid Herbicides	Melbourne	Sep 08, 2016	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
pH (1:5 Aqueous extract)	Sydney	Sep 09, 2016	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Sep 12, 2016	28 Day
- Method: APHA 5310B Total Organic Carbon			
Heavy Metals	Sydney	Sep 09, 2016	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	Sep 08, 2016	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	Sep 09, 2016	
% Moisture	Sydney	Sep 09, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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Address: Level 1, 50 Margaret St
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NSW 2000

Project Name: MACQUARIE PARK
Project ID: 52047

Order No.:
Report #: 514702
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 5:25 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																							
1	HA01 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06143	X												X					X				X	
2	HA01 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06144														X				X					
3	HA02 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06145	X																	X				X	
4	HA02 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06146														X				X					
5	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06147	X			X	X	X		X						X				X	X				
6	HA04 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06148	X									X		X	X	X			X	X			X		
7	HA04 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06149								X										X					
8	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06150	X							X		X		X		X				X					
9	HA05 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06151	X																						
10	HA06 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06152	X							X						X				X					

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Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																													
External Laboratory																													
11	HA06 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06153			X																					
12	HA07 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06154								X						X			X	X			X			
13	HA07 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06155	X																							
14	HA08 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06156	X							X						X				X						
15	HA09 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06157	X																	X					X	
16	HA10 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06158								X						X				X						
17	HA10 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06159								X										X						
18	HA11 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06160	X							X		X		X		X			X	X			X			
19	HA11 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06161								X						X				X						
20	HA12 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06162	X							X		X		X		X				X						
21	HA12 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06163			X																					
22	HA13 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06164	X							X		X		X	X	X				X						

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Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA14 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06165								X						X				X					
24	HA14 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06166	X																						
25	HA15 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06167	X																	X				X	
26	HA15 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06168	X																						
27	HA16 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06169								X		X		X	X	X				X					
28	HA16 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06170	X																						
29	HA18 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06171	X																						
30	HA18 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06172	X							X						X			X	X			X		
31	QC20160906-01	Sep 06, 2016		Soil	S16-Se06173	X			X	X	X		X						X				X	X				
32	TB	Sep 06, 2016		Water	S16-Se06174																							X
33	TS	Sep 06, 2016		Water	S16-Se06175																							X

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Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																													
External Laboratory																													
34	RINSATE	Sep 06, 2016		Water	S16-Se06176							X		X		X		X		X	X				X			
35	HA18_0.0-0.1 (BAG)	Sep 06, 2016		Soil	S16-Se06177		X																					
Test Counts						20	1	2	2	2	2	17	17	7	7	7	7	5	17	1	5	5	23	2	5	5	4	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/kg	< 0.5			0.5	Pass	
2.4-DB	mg/kg	< 0.5			0.5	Pass	
2.4.5-T	mg/kg	< 0.5			0.5	Pass	
2.4.5-TP	mg/kg	< 0.5			0.5	Pass	
Actril (loxynil)	mg/kg	< 0.5			0.5	Pass	
Dicamba	mg/kg	< 0.5			0.5	Pass	
Dichlorprop	mg/kg	< 0.5			0.5	Pass	
Dinitro-o-cresol	mg/kg	< 0.5			0.5	Pass	
Dinoseb	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Iron	mg/kg	< 20			20	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Ion Exchange Properties							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	99			70-130	Pass	
TRH C10-C14	%	93			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	91			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	98			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	110			70-130	Pass	
TRH C6-C10	%	98			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	115			70-130	Pass	
Acenaphthylene	%	112			70-130	Pass	
Anthracene	%	115			70-130	Pass	
Benz(a)anthracene	%	109			70-130	Pass	
Benzo(a)pyrene	%	105			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	101			70-130	Pass	
Benzo(k)fluoranthene	%	124			70-130	Pass	
Chrysene	%	124			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	113			70-130	Pass	
Fluorene	%	115			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	94			70-130	Pass	
Naphthalene	%	120			70-130	Pass	
Phenanthrene	%	116			70-130	Pass	
Pyrene	%	111			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	101			70-130	Pass	
4.4'-DDD	%	108			70-130	Pass	
4.4'-DDE	%	107			70-130	Pass	
4.4'-DDT	%	107			70-130	Pass	
a-BHC	%	100			70-130	Pass	
Aldrin	%	101			70-130	Pass	
b-BHC	%	96			70-130	Pass	
d-BHC	%	102			70-130	Pass	
Dieldrin	%	104			70-130	Pass	
Endosulfan I	%	103			70-130	Pass	
Endosulfan II	%	103			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	%	111			70-130	Pass	
Endrin	%	101			70-130	Pass	
Endrin aldehyde	%	113			70-130	Pass	
Endrin ketone	%	108			70-130	Pass	
g-BHC (Lindane)	%	101			70-130	Pass	
Heptachlor	%	99			70-130	Pass	
Heptachlor epoxide	%	102			70-130	Pass	
Hexachlorobenzene	%	99			70-130	Pass	
Methoxychlor	%	101			70-130	Pass	
Toxaphene	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	108			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	118			70-130	Pass	
2.4-DB	%	117			70-130	Pass	
2.4.5-T	%	126			70-130	Pass	
2.4.5-TP	%	94			70-130	Pass	
Actril (loxynil)	%	106			70-130	Pass	
Dicamba	%	93			70-130	Pass	
Dichlorprop	%	106			70-130	Pass	
Dinitro-o-cresol	%	98			70-130	Pass	
Dinoseb	%	117			70-130	Pass	
MCPA	%	105			70-130	Pass	
MCPB	%	109			70-130	Pass	
Mecoprop	%	105			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	110			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	99			70-130	Pass	
LCS - % Recovery							
Total Organic Carbon	%	105			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			70-130	Pass	
Cadmium	%	108			70-130	Pass	
Chromium	%	100			70-130	Pass	
Copper	%	113			70-130	Pass	
Iron	%	91			70-130	Pass	
Lead	%	100			70-130	Pass	
Mercury	%	104			70-130	Pass	
Nickel	%	108			70-130	Pass	
Zinc	%	96			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S16-Se05957	NCP	%	91			70-130	Pass	
TRH C10-C14	S16-Se06143	CP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S16-Se05957	NCP	%	83			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Toluene	S16-Se05957	NCP	%	90			70-130	Pass	
Ethylbenzene	S16-Se05957	NCP	%	87			70-130	Pass	
m&p-Xylenes	S16-Se05957	NCP	%	92			70-130	Pass	
o-Xylene	S16-Se05957	NCP	%	91			70-130	Pass	
Xylenes - Total	S16-Se05957	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S16-Se05957	NCP	%	88			70-130	Pass	
TRH C6-C10	S16-Se05957	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S16-Se05680	NCP	%	105			70-130	Pass	
4.4'-DDD	S16-Se05680	NCP	%	124			70-130	Pass	
4.4'-DDE	S16-Se05680	NCP	%	115			70-130	Pass	
4.4'-DDT	S16-Se05680	NCP	%	76			70-130	Pass	
a-BHC	S16-Se05680	NCP	%	99			70-130	Pass	
Aldrin	S16-Se05680	NCP	%	103			70-130	Pass	
b-BHC	S16-Se05680	NCP	%	84			70-130	Pass	
d-BHC	S16-Se05680	NCP	%	99			70-130	Pass	
Dieldrin	S16-Se05680	NCP	%	123			70-130	Pass	
Endosulfan I	S16-Se05680	NCP	%	93			70-130	Pass	
Endosulfan II	S16-Se05680	NCP	%	84			70-130	Pass	
Endosulfan sulphate	S16-Se05680	NCP	%	103			70-130	Pass	
Endrin	S16-Se05680	NCP	%	126			70-130	Pass	
Endrin aldehyde	S16-Se05680	NCP	%	113			70-130	Pass	
Endrin ketone	S16-Se05680	NCP	%	93			70-130	Pass	
g-BHC (Lindane)	S16-Se05680	NCP	%	84			70-130	Pass	
Heptachlor	S16-Se05680	NCP	%	70			70-130	Pass	
Heptachlor epoxide	S16-Se05680	NCP	%	100			70-130	Pass	
Hexachlorobenzene	S16-Se05680	NCP	%	97			70-130	Pass	
Methoxychlor	S16-Se09262	NCP	%	130			70-130	Pass	
Toxaphene	S16-Se09262	NCP	%	117			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S16-Se05680	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	S16-Se05407	NCP	%	86			70-130	Pass	
Actril (loxynil)	S16-Se05407	NCP	%	98			70-130	Pass	
Dichlorprop	S16-Se05407	NCP	%	90			70-130	Pass	
MCPA	S16-Se05407	NCP	%	81			70-130	Pass	
MCPB	S16-Se05407	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S16-Se06143	CP	%	98			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Copper	S16-Se10721	NCP	%	110			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Se06157	CP	%	105			70-130	Pass	
Acenaphthylene	S16-Se06157	CP	%	105			70-130	Pass	
Anthracene	S16-Se06157	CP	%	106			70-130	Pass	
Benz(a)anthracene	S16-Se06157	CP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(a)pyrene	S16-Se06157	CP	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Se06157	CP	%	86			70-130	Pass	
Benzo(g.h.i)perylene	S16-Se06157	CP	%	96			70-130	Pass	
Benzo(k)fluoranthene	S16-Se06157	CP	%	111			70-130	Pass	
Chrysene	S16-Se06157	CP	%	113			70-130	Pass	
Dibenz(a.h)anthracene	S16-Se06157	CP	%	85			70-130	Pass	
Fluoranthene	S16-Se06157	CP	%	105			70-130	Pass	
Fluorene	S16-Se06157	CP	%	105			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se06157	CP	%	89			70-130	Pass	
Naphthalene	S16-Se06157	CP	%	108			70-130	Pass	
Phenanthrene	S16-Se06157	CP	%	105			70-130	Pass	
Pyrene	S16-Se06157	CP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S16-Se06158	CP	%	104			70-130	Pass	
Cadmium	S16-Se06158	CP	%	90			70-130	Pass	
Chromium	S16-Se06158	CP	%	88			70-130	Pass	
Lead	S16-Se06158	CP	%	114			70-130	Pass	
Mercury	S16-Se06158	CP	%	96			70-130	Pass	
Nickel	S16-Se06158	CP	%	89			70-130	Pass	
Zinc	S16-Se06158	CP	%	82			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S16-Se06173	CP	%	94			70-130	Pass	
Acenaphthylene	S16-Se06173	CP	%	96			70-130	Pass	
Anthracene	S16-Se06173	CP	%	93			70-130	Pass	
Benz(a)anthracene	S16-Se06173	CP	%	93			70-130	Pass	
Benzo(a)pyrene	S16-Se06173	CP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	S16-Se06173	CP	%	79			70-130	Pass	
Benzo(g.h.i)perylene	S16-Se06173	CP	%	80			70-130	Pass	
Benzo(k)fluoranthene	S16-Se06173	CP	%	98			70-130	Pass	
Chrysene	S16-Se06173	CP	%	100			70-130	Pass	
Dibenz(a.h)anthracene	S16-Se06173	CP	%	74			70-130	Pass	
Fluoranthene	S16-Se06173	CP	%	95			70-130	Pass	
Fluorene	S16-Se06173	CP	%	97			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se06173	CP	%	75			70-130	Pass	
Naphthalene	S16-Se06173	CP	%	100			70-130	Pass	
Phenanthrene	S16-Se06173	CP	%	94			70-130	Pass	
Pyrene	S16-Se06173	CP	%	91			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S16-Se07545	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S16-Se05011	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S16-Se05011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S16-Se05011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S16-Se07545	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S16-Se07545	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S16-Se07545	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S16-Se07545	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S16-Se07545	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S16-Se07545	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S16-Se07545	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S16-Se07545	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Acid Herbicides				Result 1	Result 2	RPD			
2.4-D	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-DB	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-T	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-TP	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Actril (loxynil)	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dicamba	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorprop	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinitro-o-cresol	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dinoseb	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPA	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
MCPB	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Mecoprop	M16-Jl12772	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S16-Se05011	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S16-Se05011	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S16-Se05011	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se06146	CP	%	17	17	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C)	M16-Se07523	NCP	uS/cm	170	180	4.0	30%	Pass	
pH (1:5 Aqueous extract)	S16-Se07628	NCP	pH Units	6.7	6.6	pass	30%	Pass	
Total Organic Carbon	S16-Se03661	NCP	%	0.7	0.7	3.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S16-Se06156	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S16-Se06157	CP	mg/kg	2.8	2.2	26	30%	Pass	
Cadmium	S16-Se06157	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S16-Se06157	CP	mg/kg	12	10.0	20	30%	Pass	
Copper	S16-Se06157	CP	mg/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S16-Se06157	CP	mg/kg	5.4	5.7	7.0	30%	Pass	
Mercury	S16-Se06157	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Nickel	S16-Se06157	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S16-Se06157	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se06159	CP	%	13	14	5.0	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S16-Se06164	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S16-Se06164	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S16-Se06164	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S16-Se06164	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S16-Se06164	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S16-Se06164	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Ivan Taylor	Senior Analyst-Metal (NSW)
Joseph Edouard	Senior Analyst-Organic (VIC)
Rhys Thomas	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Lindsey Blecher**

Report **514702-W**
Project name MACQUARIE PARK
Project ID 52047
Received Date Sep 06, 2016

Client Sample ID			**TB**	**TS**	**RINSATE**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se06174**	**S16-Se06175**	**S16-Se06176**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	72%	< 0.02
TRH C10-C14	0.05	mg/L	-	-	< 0.05
TRH C15-C28	0.1	mg/L	-	-	< 0.1
TRH C29-C36	0.1	mg/L	-	-	< 0.1
TRH C10-36 (Total)	0.1	mg/L	-	-	< 0.1
BTEX					
Benzene	0.001	mg/L	< 0.001	91%	< 0.001
Toluene	0.001	mg/L	< 0.001	90%	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	85%	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	86%	< 0.002
o-Xylene	0.001	mg/L	< 0.001	88%	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	87%	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	97	118
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH C6-C10	0.02	mg/L	< 0.02	74%	-
Volatile Organics					
Naphthalene[N02]	0.01	mg/L	< 0.01	82%	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	-	-	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	-	< 0.05
TRH C6-C10	0.02	mg/L	-	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	-	< 0.02
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	-	-	< 0.001
Acenaphthylene	0.001	mg/L	-	-	< 0.001
Anthracene	0.001	mg/L	-	-	< 0.001
Benz(a)anthracene	0.001	mg/L	-	-	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	-	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	-	-	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	-	-	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	-	< 0.001
Chrysene	0.001	mg/L	-	-	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	-	-	< 0.001

Client Sample ID			TB	TS	RINSATE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se06174**	**S16-Se06175**	**S16-Se06176**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Fluoranthene	0.001	mg/L	-	-	< 0.001
Fluorene	0.001	mg/L	-	-	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	-	< 0.001
Naphthalene	0.001	mg/L	-	-	< 0.001
Phenanthrene	0.001	mg/L	-	-	< 0.001
Pyrene	0.001	mg/L	-	-	< 0.001
Total PAH*	0.001	mg/L	-	-	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	-	82
p-Terphenyl-d14 (surr.)	1	%	-	-	113
Organochlorine Pesticides					
Chlordanes - Total	0.001	mg/L	-	-	< 0.001
4.4'-DDD	0.0001	mg/L	-	-	< 0.0001
4.4'-DDE	0.0001	mg/L	-	-	< 0.0001
4.4'-DDT	0.0001	mg/L	-	-	< 0.0001
a-BHC	0.0001	mg/L	-	-	< 0.0001
Aldrin	0.0001	mg/L	-	-	< 0.0001
b-BHC	0.0001	mg/L	-	-	< 0.0001
d-BHC	0.0001	mg/L	-	-	< 0.0001
Dieldrin	0.0001	mg/L	-	-	< 0.0001
Endosulfan I	0.0001	mg/L	-	-	< 0.0001
Endosulfan II	0.0001	mg/L	-	-	< 0.0001
Endosulfan sulphate	0.0001	mg/L	-	-	< 0.0001
Endrin	0.0001	mg/L	-	-	< 0.0001
Endrin aldehyde	0.0001	mg/L	-	-	< 0.0001
Endrin ketone	0.0001	mg/L	-	-	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	-	-	< 0.0001
Heptachlor	0.0001	mg/L	-	-	< 0.0001
Heptachlor epoxide	0.0001	mg/L	-	-	< 0.0001
Hexachlorobenzene	0.0001	mg/L	-	-	< 0.0001
Methoxychlor	0.0001	mg/L	-	-	< 0.0001
Toxaphene	0.01	mg/L	-	-	< 0.01
Dibutylchlorendate (surr.)	1	%	-	-	51
Tetrachloro-m-xylene (surr.)	1	%	-	-	53
Polychlorinated Biphenyls					
Aroclor-1016	0.001	mg/L	-	-	< 0.001
Aroclor-1221	0.001	mg/L	-	-	< 0.001
Aroclor-1232	0.001	mg/L	-	-	< 0.001
Aroclor-1242	0.001	mg/L	-	-	< 0.001
Aroclor-1248	0.001	mg/L	-	-	< 0.001
Aroclor-1254	0.001	mg/L	-	-	< 0.001
Aroclor-1260	0.001	mg/L	-	-	< 0.001
Total PCB*	0.001	mg/L	-	-	<0.001
Dibutylchlorendate (surr.)	1	%	-	-	51
Tetrachloro-m-xylene (surr.)	1	%	-	-	53
Acid Herbicides					
2.4-D	0.001	mg/L	-	-	< 0.001
2.4-DB	0.001	mg/L	-	-	< 0.001
2.4.5-T	0.001	mg/L	-	-	< 0.001
2.4.5-TP	0.001	mg/L	-	-	< 0.001

Client Sample ID			TB	TS	RINSATE
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S16-Se06174**	**S16-Se06175**	**S16-Se06176**
Date Sampled			**Sep 06, 2016**	**Sep 06, 2016**	**Sep 06, 2016**
Test/Reference	LOR	Unit			
Acid Herbicides					
Actril (loxynil)	0.001	mg/L	-	-	< 0.001
Dicamba	0.001	mg/L	-	-	< 0.001
Dichlorprop	0.001	mg/L	-	-	< 0.001
Dinitro-o-cresol	0.001	mg/L	-	-	< 0.001
Dinoseb	0.001	mg/L	-	-	< 0.001
MCPA	0.001	mg/L	-	-	< 0.001
MCPB	0.001	mg/L	-	-	< 0.001
Mecoprop	0.001	mg/L	-	-	< 0.001
Warfarin (surr.)	1	%	-	-	int
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
TRH >C10-C16	0.05	mg/L	-	-	< 0.05
TRH >C16-C34	0.1	mg/L	-	-	< 0.1
TRH >C34-C40	0.1	mg/L	-	-	< 0.1
Heavy Metals					
Arsenic (filtered)	0.001	mg/L	-	-	< 0.001
Cadmium (filtered)	0.0002	mg/L	-	-	< 0.0002
Chromium (filtered)	0.001	mg/L	-	-	< 0.001
Copper (filtered)	0.001	mg/L	-	-	0.001
Lead (filtered)	0.001	mg/L	-	-	< 0.001
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001
Nickel (filtered)	0.001	mg/L	-	-	0.001
Zinc (filtered)	0.001	mg/L	-	-	0.006

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH C6-C10 less BTEX (F1)	Melbourne	Sep 07, 2016	14 Day
- Method: LM-LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 08, 2016	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Melbourne	Sep 07, 2016	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Sydney	Sep 07, 2016	7 Day
- Method: E016 Volatile Organic Compounds (VOC)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 07, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
JBS&G Suite 2			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 08, 2016	7 Day
- Method: USEPA 8270 Polycyclic Aromatic Hydrocarbons			
Organochlorine Pesticides	Melbourne	Sep 08, 2016	7 Day
- Method: USEPA 8081 Organochlorine Pesticides			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 08, 2016	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polychlorinated Biphenyls	Melbourne	Sep 08, 2016	7 Days
- Method: USEPA 8082 Polychlorinated Biphenyls			
Acid Herbicides	Melbourne	Sep 08, 2016	14 Day
- Method: LTM-ORG-2180 Phenoxy Acid Herbicides			
Metals M8 filtered	Melbourne	Sep 07, 2016	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			

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NATA # 1261 Site # 18217

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK
Project ID: 52047

Order No.:
Report #: 514702
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 5:25 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																							
1	HA01 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06143	X												X					X				X	
2	HA01 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06144														X				X					
3	HA02 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06145	X																	X				X	
4	HA02 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06146														X				X					
5	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06147	X			X	X	X		X						X				X	X				
6	HA04 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06148	X									X		X	X	X			X	X			X		
7	HA04 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06149								X										X					
8	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06150	X							X		X		X		X				X					
9	HA05 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06151	X																						
10	HA06 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06152	X							X						X				X					

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Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																													
External Laboratory																													
11	HA06 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06153			X																					
12	HA07 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06154								X						X			X	X			X			
13	HA07 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06155	X																							
14	HA08 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06156	X							X						X				X						
15	HA09 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06157	X																	X					X	
16	HA10 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06158								X						X				X						
17	HA10 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06159								X										X						
18	HA11 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06160	X							X		X		X		X			X	X			X			
19	HA11 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06161								X						X				X						
20	HA12 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06162	X							X		X		X		X				X						
21	HA12 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06163			X																					
22	HA13 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06164	X							X		X		X	X	X				X						

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Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA14 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06165								X						X				X					
24	HA14 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06166	X																						
25	HA15 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06167	X																	X				X	
26	HA15 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06168	X																						
27	HA16 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06169								X		X		X	X	X				X					
28	HA16 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06170	X																						
29	HA18 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06171	X																						
30	HA18 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06172	X							X						X			X	X			X		
31	QC20160906-01	Sep 06, 2016		Soil	S16-Se06173	X			X	X	X		X						X				X	X				
32	TB	Sep 06, 2016		Water	S16-Se06174																							X
33	TS	Sep 06, 2016		Water	S16-Se06175																							X

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Project ID: 52047

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Received: Sep 6, 2016 5:25 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
34	RINSATE	Sep 06, 2016		Water	S16-Se06176							X		X		X		X		X	X				X			
35	HA18_0.0-0.1 (BAG)	Sep 06, 2016		Soil	S16-Se06177		X																					
Test Counts						20	1	2	2	2	2	17	17	7	7	7	7	5	17	1	5	5	23	2	5	5	4	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

mg/l: milligrams per litre

ug/l: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100ml: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Volatile Organics							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.001			0.001	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.001			0.001	Pass	
Aroclor-1242	mg/L	< 0.001			0.001	Pass	
Aroclor-1248	mg/L	< 0.001			0.001	Pass	
Aroclor-1254	mg/L	< 0.001			0.001	Pass	
Aroclor-1260	mg/L	< 0.001			0.001	Pass	
Total PCB*	mg/L	<0.001			0.001	Pass	
Method Blank							
Acid Herbicides							
2.4-D	mg/L	< 0.001			0.001	Pass	
2.4-DB	mg/L	< 0.001			0.001	Pass	
2.4.5-T	mg/L	< 0.001			0.001	Pass	
2.4.5-TP	mg/L	< 0.001			0.001	Pass	
Actril (loxynil)	mg/L	< 0.001			0.001	Pass	
Dicamba	mg/L	< 0.001			0.001	Pass	
Dichlorprop	mg/L	< 0.001			0.001	Pass	
Dinitro-o-cresol	mg/L	< 0.001			0.001	Pass	
Dinoseb	mg/L	< 0.001			0.001	Pass	
MCPA	mg/L	< 0.001			0.001	Pass	
MCPB	mg/L	< 0.001			0.001	Pass	
Mecoprop	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	89			70-130	Pass	
TRH C10-C14	%	70			70-130	Pass	
LCS - % Recovery							
BTEX							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzene	%	93			70-130	Pass	
Toluene	%	87			70-130	Pass	
Ethylbenzene	%	79			70-130	Pass	
m&p-Xylenes	%	75			70-130	Pass	
Xylenes - Total	%	76			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	81			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
Naphthalene	%	101			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	75			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	72			70-130	Pass	
Benzo(b&j)fluoranthene	%	88			70-130	Pass	
Benzo(g.h.i)perylene	%	84			70-130	Pass	
Benzo(k)fluoranthene	%	73			70-130	Pass	
Chrysene	%	82			70-130	Pass	
Dibenz(a.h)anthracene	%	103			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	87			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	96			70-130	Pass	
Naphthalene	%	73			70-130	Pass	
Phenanthrene	%	82			70-130	Pass	
Pyrene	%	74			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
4.4'-DDD	%	98			70-130	Pass	
4.4'-DDE	%	75			70-130	Pass	
4.4'-DDT	%	84			70-130	Pass	
a-BHC	%	93			70-130	Pass	
Aldrin	%	74			70-130	Pass	
b-BHC	%	87			70-130	Pass	
d-BHC	%	88			70-130	Pass	
Dieldrin	%	128			70-130	Pass	
Endosulfan I	%	78			70-130	Pass	
Endosulfan II	%	89			70-130	Pass	
Endosulfan sulphate	%	80			70-130	Pass	
Endrin	%	89			70-130	Pass	
Endrin aldehyde	%	83			70-130	Pass	
Endrin ketone	%	79			70-130	Pass	
g-BHC (Lindane)	%	98			70-130	Pass	
Heptachlor	%	89			70-130	Pass	
Heptachlor epoxide	%	73			70-130	Pass	
Hexachlorobenzene	%	95			70-130	Pass	
Methoxychlor	%	86			70-130	Pass	
LCS - % Recovery							
Acid Herbicides							
2.4-D	%	98			70-130	Pass	
2.4-DB	%	70			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4.5-T	%	104			70-130	Pass	
2.4.5-TP	%	99			70-130	Pass	
Actril (loxynil)	%	72			70-130	Pass	
Dicamba	%	101			70-130	Pass	
Dichlorprop	%	97			70-130	Pass	
Dinitro-o-cresol	%	70			70-130	Pass	
Dinoseb	%	89			70-130	Pass	
MCPA	%	74			70-130	Pass	
MCPB	%	79			70-130	Pass	
Mecoprop	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	70			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic (filtered)	%	91			80-120	Pass	
Cadmium (filtered)	%	94			80-120	Pass	
Chromium (filtered)	%	90			80-120	Pass	
Copper (filtered)	%	89			80-120	Pass	
Lead (filtered)	%	90			80-120	Pass	
Mercury (filtered)	%	88			70-130	Pass	
Nickel (filtered)	%	89			80-120	Pass	
Zinc (filtered)	%	91			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M16-Se06458	NCP	%	122			70-130	Pass	
TRH C10-C14	B16-Se05044	NCP	%	122			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M16-Se06458	NCP	%	127			70-130	Pass	
Toluene	M16-Se06458	NCP	%	127			70-130	Pass	
Ethylbenzene	M16-Se06458	NCP	%	129			70-130	Pass	
m&p-Xylenes	M16-Se06458	NCP	%	126			70-130	Pass	
o-Xylene	M16-Se06458	NCP	%	126			70-130	Pass	
Xylenes - Total	M16-Se06458	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	M16-Se06458	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Naphthalene	M16-Se06458	NCP	%	128			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M16-Se06956	NCP	%	99			70-130	Pass	
Acenaphthylene	M16-Se06956	NCP	%	117			70-130	Pass	
Anthracene	M16-Se06956	NCP	%	109			70-130	Pass	
Benz(a)anthracene	M16-Se06956	NCP	%	119			70-130	Pass	
Benzo(a)pyrene	M16-Se06956	NCP	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	M16-Se06956	NCP	%	104			70-130	Pass	
Benzo(g.h.i)perylene	M16-Se06956	NCP	%	95			70-130	Pass	
Benzo(k)fluoranthene	M16-Se06956	NCP	%	91			70-130	Pass	
Chrysene	M16-Se06956	NCP	%	75			70-130	Pass	
Dibenz(a.h)anthracene	M16-Se06956	NCP	%	118			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	M16-Se06956	NCP	%	106			70-130	Pass	
Fluorene	M16-Se06956	NCP	%	113			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se06956	NCP	%	110			70-130	Pass	
Naphthalene	M16-Se06956	NCP	%	76			70-130	Pass	
Phenanthrene	M16-Se06956	NCP	%	92			70-130	Pass	
Pyrene	M16-Se06956	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDD	M16-Se05365	NCP	%	74			70-130	Pass	
4.4'-DDE	M16-Se05365	NCP	%	76			70-130	Pass	
4.4'-DDT	M16-Se05365	NCP	%	78			70-130	Pass	
a-BHC	M16-Se05365	NCP	%	89			70-130	Pass	
Aldrin	M16-Se05499	NCP	%	93			70-130	Pass	
b-BHC	M16-Se05365	NCP	%	84			70-130	Pass	
d-BHC	M16-Se05365	NCP	%	86			70-130	Pass	
Dieldrin	M16-Se05365	NCP	%	118			70-130	Pass	
Endosulfan I	M16-Se05365	NCP	%	74			70-130	Pass	
Endosulfan II	M16-Se05365	NCP	%	84			70-130	Pass	
Endosulfan sulphate	M16-Se05365	NCP	%	79			70-130	Pass	
Endrin	M16-Se05365	NCP	%	95			70-130	Pass	
Endrin aldehyde	M16-Se05365	NCP	%	77			70-130	Pass	
Endrin ketone	M16-Se05365	NCP	%	80			70-130	Pass	
g-BHC (Lindane)	M16-Se05365	NCP	%	97			70-130	Pass	
Heptachlor	M16-Se05499	NCP	%	72			70-130	Pass	
Heptachlor epoxide	M16-Se05365	NCP	%	75			70-130	Pass	
Hexachlorobenzene	M16-Se05499	NCP	%	119			70-130	Pass	
Methoxychlor	M16-Se05365	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Acid Herbicides				Result 1					
2.4-D	B16-Au24551	NCP	%	102			70-130	Pass	
Actril (loxynil)	B16-Au24551	NCP	%	93			70-130	Pass	
Dichlorprop	B16-Au24551	NCP	%	102			70-130	Pass	
MCPA	B16-Au24551	NCP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	B16-Se05044	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M16-Se05438	NCP	%	95			70-130	Pass	
Cadmium (filtered)	M16-Se05438	NCP	%	94			70-130	Pass	
Chromium (filtered)	M16-Se05438	NCP	%	90			70-130	Pass	
Copper (filtered)	M16-Se05438	NCP	%	86			70-130	Pass	
Lead (filtered)	M16-Se05438	NCP	%	89			70-130	Pass	
Mercury (filtered)	M16-Se05438	NCP	%	101			70-130	Pass	
Nickel (filtered)	M16-Se05438	NCP	%	87			70-130	Pass	
Zinc (filtered)	M16-Se05438	NCP	%	89			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M16-Se06457	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M16-Se05364	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M16-Se05364	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M16-Se05364	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M16-Se06457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M16-Se06457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M16-Se06457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M16-Se06457	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M16-Se06457	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M16-Se06457	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C10	M16-Se06457	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Naphthalene	M16-Se06457	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M16-Se05364	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Toxaphene	M16-Se05364	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1221	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1232	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1242	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1248	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1254	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Aroclor-1260	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Total PCB*	M16-Se05364	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M16-Se05364	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M16-Se05364	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M16-Se05364	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M16-Se05438	NCP	mg/L	0.001	0.001	12	30%	Pass	
Cadmium (filtered)	M16-Se05438	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M16-Se05438	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M16-Se05438	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	M16-Se05438	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	M16-Se05438	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M16-Se05438	NCP	mg/L	0.011	0.010	2.0	30%	Pass	
Zinc (filtered)	M16-Se05438	NCP	mg/L	0.008	0.007	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Lindsey Blecher
Report	514702-AID
Project Name	MACQUARIE PARK
Project ID	52047
Received Date	Sep 06, 2016
Date Reported	Sep 13, 2016

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name MACQUARIE PARK
Project ID 52047
Date Sampled Sep 06, 2016
Report 514702-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA01 0.0-0.1M	16-Se06143	Sep 06, 2016	Approximate Sample 637g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA02 0.0-0.05M	16-Se06145	Sep 06, 2016	Approximate Sample 348g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA03 0.0-0.1M	16-Se06147	Sep 06, 2016	Approximate Sample 558g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA04 0.0-0.1M	16-Se06148	Sep 06, 2016	Approximate Sample 553g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA03 0.0-0.1M	16-Se06150	Sep 06, 2016	Approximate Sample 414g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA05 0.3-0.4M	16-Se06151	Sep 06, 2016	Approximate Sample 744g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA06 0.0-0.1M	16-Se06152	Sep 06, 2016	Approximate Sample 662g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA07 0.2-0.3M	16-Se06155	Sep 06, 2016	Approximate Sample 624g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA08 0.0-0.1M	16-Se06156	Sep 06, 2016	Approximate Sample 623g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA09 0.0-0.1M	16-Se06157	Sep 06, 2016	Approximate Sample 570g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
HA11 0.0-0.1M	16-Se06160	Sep 06, 2016	Approximate Sample 508g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA12 0.0-0.1M	16-Se06162	Sep 06, 2016	Approximate Sample 613g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA13 0.0-0.1M	16-Se06164	Sep 06, 2016	Approximate Sample 617g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA14 0.2-0.3M	16-Se06166	Sep 06, 2016	Approximate Sample 493g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA15 0.0-0.1M	16-Se06167	Sep 06, 2016	Approximate Sample 477g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA15 0.2-0.3M	16-Se06168	Sep 06, 2016	Approximate Sample 492g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA16 0.2-0.3M	16-Se06170	Sep 06, 2016	Approximate Sample 615g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA18 0.0-0.05M	16-Se06171	Sep 06, 2016	Approximate Sample 341g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
HA18 0.2-0.3M	16-Se06172	Sep 06, 2016	Approximate Sample 442g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
QC20160906-01	16-Se06173	Sep 06, 2016	Approximate Sample 587g Sample consisted of: brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Sep 08, 2016	Indefinite

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK
Project ID: 52047

Order No.:
Report #: 514702
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 5:25 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																							
1	HA01 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06143	X												X					X				X	
2	HA01 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06144														X				X					
3	HA02 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06145	X																	X				X	
4	HA02 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06146														X				X					
5	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06147	X			X	X	X		X						X				X	X				
6	HA04 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06148	X									X		X	X	X			X	X			X		
7	HA04 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06149								X										X					
8	HA03 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06150	X							X		X		X		X				X					
9	HA05 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06151	X																						
10	HA06 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06152	X							X						X				X					

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Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																													
External Laboratory																													
11	HA06 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06153			X																					
12	HA07 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06154								X						X			X	X			X			
13	HA07 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06155	X																							
14	HA08 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06156	X							X						X				X						
15	HA09 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06157	X																	X				X		
16	HA10 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06158								X						X				X						
17	HA10 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06159								X										X						
18	HA11 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06160	X							X		X		X		X			X	X			X			
19	HA11 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06161								X						X				X						
20	HA12 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06162	X							X		X		X		X				X						
21	HA12 0.3-0.4M	Sep 06, 2016		Soil	S16-Se06163			X																					
22	HA13 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06164	X							X		X		X	X	X				X						

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Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																												
External Laboratory																												
23	HA14 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06165								X						X				X					
24	HA14 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06166	X																						
25	HA15 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06167	X																	X				X	
26	HA15 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06168	X																						
27	HA16 0.0-0.1M	Sep 06, 2016		Soil	S16-Se06169								X		X		X	X	X				X					
28	HA16 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06170	X																						
29	HA18 0.0-0.05M	Sep 06, 2016		Soil	S16-Se06171	X																						
30	HA18 0.2-0.3M	Sep 06, 2016		Soil	S16-Se06172	X							X						X			X	X			X		
31	QC20160906-01	Sep 06, 2016		Soil	S16-Se06173	X			X	X	X		X						X				X	X				
32	TB	Sep 06, 2016		Water	S16-Se06174																							X
33	TS	Sep 06, 2016		Water	S16-Se06175																							X

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name: JBS & G Australia (NSW & WA) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: MACQUARIE PARK
Project ID: 52047

Order No.:
Report #: 514702
Phone: 02 8245 0300
Fax:

Received: Sep 6, 2016 5:25 PM
Due: Sep 13, 2016
Priority: 5 Day
Contact Name: Lindsey Blecher

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	CANCELLED	HOLD	Iron	pH (1:5 Aqueous extract)	Total Organic Carbon	Polycyclic Aromatic Hydrocarbons	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Organochlorine Pesticides	Polychlorinated Biphenyls	Polychlorinated Biphenyls	Acid Herbicides	Metals M8	Metals M8 filtered	BTEX	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	Total Recoverable Hydrocarbons	JBS&G Suite 2	BTEX and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271											X	X		X		X		X		X	X			X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X			X		X		X		X			X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																													
External Laboratory																													
34	RINSATE	Sep 06, 2016		Water	S16-Se06176							X		X		X		X		X	X				X			
35	HA18_0.0-0.1 (BAG)	Sep 06, 2016		Soil	S16-Se06177		X																					
Test Counts						20	1	2	2	2	2	17	17	7	7	7	7	5	17	1	5	5	23	2	5	5	4	2

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Se06145, Se06150, Se06166, Se06167, Se06168, Se006171, Se06172; Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Rhys Thomas Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

Signed 21.9.16

Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

SC

516962

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Wednesday, 21 September 2016 11:47 AM
To: Nibha Vaidya
Cc: Alex Finney
Subject: 52047 Ivanhoe Estate

Hi Nibha,

As per our phone call, could I please request the following additional analyses -

Report 514702

TRHs with Silica Gel Clean-up for HA15 0.0-0.1

Report 514668

ASLP and TCLP for PAHs for sample HA20 0.0-0.10

TRHs with Silica Gel Clean-up for HA32 0-0.5

Regards,

Lindsey

Lindsey Blecher | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
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T: 02 8245 0300 | M: 0451 047 759 | www.jbsg.com.au
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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW & WA) P/L**
Contact name:	Lindsey Blecher
Project name:	ADDITIONAL: MACQUARIE PARK
Project ID:	52047
COC number:	Not provided
Turn around time:	3 Day
Date/Time received:	Sep 21, 2016 11:47 AM
Eurofins | mgt reference:	**516962**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 6.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Additional from report 514702

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Lindsey Blecher - LBlecher@jbsg.com.au.

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Certificate of Analysis

JBS & G Australia (NSW & WA) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Lindsey Blecher**

Report **516962-S**
Project name ADDITIONAL: MACQUARIE PARK
Project ID 52047
Received Date Sep 21, 2016

Client Sample ID			**HA15_0.0-0.1**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S16-Se21949**
Date Sampled			**Sep 06, 2016**
Test/Reference	LOR	Unit	
TRH - 2013 NEPM Fractions (after silica gel clean-up)			
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	< 50
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	< 100
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	< 100
TRH - 1999 NEPM Fractions (after silica gel clean-up)			
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	< 100
TRH C10-C14 (after silica gel clean-up)	50	mg/kg	< 50
TRH C15-C28 (after silica gel clean-up)	100	mg/kg	< 100
TRH C29-C36 (after silica gel clean-up)	100	mg/kg	< 100
% Moisture	1	%	17

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Sydney	Sep 23, 2016	14 Day
- Method: LM-LTM-ORG2010			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Sydney	Sep 23, 2016	14 Day
- Method: LM-LTM-ORG2010			
% Moisture	Sydney	Sep 23, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

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NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	JBS & G Australia (NSW & WA) P/L	**Order No.:**		**Received:**	Sep 21, 2016 11:47 AM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	516962	**Due:**	Sep 26, 2016
		Phone:	02 8245 0300	**Priority:**	3 Day
		Fax:		**Contact Name:**	Lindsey Blecher
Project Name:	ADDITIONAL: MACQUARIE PARK				
Project ID:	52047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						TRH (after Silica Gel cleanup)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	HA15_0.0-0.1	Sep 06, 2016		Soil	S16-Se21949	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH >C16-C34 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH >C34-C40 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
Method Blank							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C36 (Total) (after silica gel clean-up)	mg/kg	< 0			100	Pass	
TRH C10-C14 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH C15-C28 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH C29-C36 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
LCS - % Recovery							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	%	129			70-130	Pass	
LCS - % Recovery							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	%	123			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se21949	CP	%	17	17	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Ellen Wandala Gamage

Subject: FW: 52047 Ivanhoe Estate

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Thursday, 29 September 2016 5:11 PM
To: Nibha Vaidya
Cc: Alex Finney
Subject: RE: 52047 Ivanhoe Estate

Thanks Nibha,

I no longer need the requested ASLP or TCLP, just the TRH with silica gel.

Cheers

Regards,

Lindsey

Lindsey Blecher | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0451 047 759 | www.jbsg.com.au

#517819.

Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Thursday, 29 September 2016 5:09 PM
To: Lindsey Blecher <LBlecher@jbsg.com.au>
Cc: Alex Finney <AFinney@jbsg.com.au>
Subject: RE: 52047 Ivanhoe Estate

Hi Lindsey,

I am getting the guys to look into it ASAP. The results will be available by tomorrow.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Thursday, 29 September 2016 3:59 PM
To: Nibha Vaidya

Cc: Alex Finney
Subject: RE: 52047 Ivanhoe Estate

Hi Nibha,

I got the results for additional analyses for report 514702, but no SRA or results for additional analyses for report 514668.

Did you find out if the lab had the extract for HA32 0-0.5?

Regards,

Lindsey

Lindsey Blecher | Environmental Consultant | JBS&G
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Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Wednesday, 21 September 2016 12:14 PM
To: Lindsey Blecher <LBlecher@jbsg.com.au>
Cc: Alex Finney <AFinney@jbsg.com.au>
Subject: RE: 52047 Ivanhoe Estate

Hi Lindsey,

Thanks for the email. I am getting the lab to check whether we still have the original TRH extract for sample 'HA32 0-0.5'.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Lindsey Blecher [mailto:LBlecher@jbsg.com.au]
Sent: Wednesday, 21 September 2016 11:47 AM
To: Nibha Vaidya
Cc: Alex Finney
Subject: 52047 Ivanhoe Estate

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NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Sample Receipt Advice

Company name:	**JBS & G Australia (NSW & WA) P/L**
Contact name:	Lindsey Blecher
Project name:	ADDTIONAL: MACQUARIE PARK NSW
Project ID:	52047
COC number:	Not provided
Turn around time:	1 Day
Date/Time received:	Sep 29, 2016 5:11 PM
Eurofins | mgt reference:	**517819**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 7.9 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Lindsey Blecher - LBlecher@jbsg.com.au.

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Certificate of Analysis

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Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Lindsey Blecher**

Report **517819-S**
Project name ADDTIONAL: MACQUARIE PARK NSW
Project ID 52047
Received Date Sep 29, 2016

Client Sample ID			**HA32 0-0.5m**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S16-Se27838**
Date Sampled			**Sep 05, 2016**
Test/Reference	LOR	Unit	
TRH - 2013 NEPM Fractions (after silica gel clean-up)			
TRH >C10-C16 (after silica gel clean-up)	50	mg/kg	< 50
TRH >C16-C34 (after silica gel clean-up)	100	mg/kg	< 100
TRH >C34-C40 (after silica gel clean-up)	100	mg/kg	< 100
TRH - 1999 NEPM Fractions (after silica gel clean-up)			
TRH C10-C36 (Total) (after silica gel clean-up)	100	mg/kg	< 100
TRH C10-C14 (after silica gel clean-up)	50	mg/kg	< 50
TRH C15-C28 (after silica gel clean-up)	100	mg/kg	< 100
TRH C29-C36 (after silica gel clean-up)	100	mg/kg	< 100
% Moisture	1	%	46

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
TRH - 2013 NEPM Fractions (after silica gel clean-up)	Sydney	Sep 29, 2016	14 Day
- Method: LM-LTM-ORG2010			
TRH - 1999 NEPM Fractions (after silica gel clean-up)	Sydney	Sep 29, 2016	14 Day
- Method: LM-LTM-ORG2010			
% Moisture	Sydney	Sep 29, 2016	14 Day
- Method: LTM-GEN-7080 Moisture			

eurofins | mgt

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NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Company Name:	JBS & G Australia (NSW & WA) P/L	**Order No.:**		**Received:**	Sep 29, 2016 5:11 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	517819	**Due:**	Sep 30, 2016
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Lindsey Blecher
Project Name:	ADDTIONAL: MACQUARIE PARK NSW				
Project ID:	52047				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						TRH (after Silica Gel cleanup)	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	HA32 0-0.5m	Sep 05, 2016		Soil	S16-Se27838	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH >C16-C34 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH >C34-C40 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
Method Blank							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C36 (Total) (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH C10-C14 (after silica gel clean-up)	mg/kg	< 50			50	Pass	
TRH C15-C28 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
TRH C29-C36 (after silica gel clean-up)	mg/kg	< 100			100	Pass	
LCS - % Recovery							
TRH - 2013 NEPM Fractions (after silica gel clean-up)							
TRH >C10-C16 (after silica gel clean-up)	%	127			70-130	Pass	
LCS - % Recovery							
TRH - 1999 NEPM Fractions (after silica gel clean-up)							
TRH C10-C14 (after silica gel clean-up)	%	125			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S16-Se27838	CP	%	46	43	6.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Ivan Taylor	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY

JBS&G

PROJECT NO.: S2047
PROJECT NAME: Macquarie Park, NSW
DATE NEEDED BY: STD TAT
LABORATORY BATCH NO.:
SAMPLERS: A. Finney L Blecher
QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) L.Blecher@jbsg.com.au; (3) AFinney@jbsg.com.au
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Heavy Metals	PAH	TRH/BTEX	Asbestos	OCPs/PCBs	Herbicides	OM, Fe, Cec, pH	ASLP / TCLP	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
QC20160905-01A	Soil	05/09	—	Bag, Jar, Ice		X	X	X								
~~Soil~~	~~Soil~~	~~05/09~~		~~Bag, Jar, Ice~~												

RELINQUISHED BY:
NAME: DATE: 05/09.
OF: JBS&G
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME:
DATE:
OF:
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Page 1 of 1 (Envirolab)

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047
PROJECT NAME: Macquarie Park, NSW
DATE NEEDED BY: STD TAT

LABORATORY BATCH NO.:
SAMPLERS: A. Finney L Blecher
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) L Blecher @jbsg.com.au; (3) A Finney @jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Schedule to follow via email.

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QC20160905-01A	Soil	05/09	—	Bag, Jar, Ice				
2	~~Soil~~	~~Soil~~	~~05/09~~	~~—~~	~~Bag, Jar, Ice~~				

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

Job No: 152971
Date Received: 6/9
Time Received: 1230
Received by: PH
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE: 05/09.	CONSIGNMENT NOTE NO.	NAME: PH	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 6/9 OF: ELS 1230	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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

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

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

CERTIFICATE OF ANALYSIS 152971

Client:

JBS & G (NSW & WA) Pty Ltd
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: L Blecher, A Finney

Sample log in details:

Your Reference:	**52047 - Macquarie Park**		
No. of samples:	1 soil		
Date samples received / completed instructions received	06/09/16	/	06/09/16

Analysis Details:

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

Report Details:

Date results requested by: / Issue Date:	13/09/16	/	9/09/16
Date of Preliminary Report:	Not Issued		

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

Results Approved By:

David Springer
General Manager

PAHs in Soil		
Our Reference:	UNITS	152971-1
Your Reference	---------- -	QC20160905-01A
Date Sampled	----------	5/09/2016
Type of sample		soil
Date extracted	-	07/09/2016
Date analysed	-	07/09/2016
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 Positive PAHs	mg/kg	NIL (+)VE
Surrogate p-Terphenyl-d14	%	87

Acid Extractable metals in soil		
Our Reference:	UNITS	152971-1
Your Reference	----------	QC20160905-01A
	-	
Date Sampled	----------	5/09/2016
Type of sample		soil
Date prepared	-	07/09/2016
Date analysed	-	07/09/2016
Arsenic	mg/kg	12
Cadmium	mg/kg	<0.4
Chromium	mg/kg	25
Copper	mg/kg	11
Lead	mg/kg	14
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	20

Moisture		
Our Reference:	UNITS	152971-1
Your Reference	---------- -	QC20160905-01A
Date Sampled	----------	5/09/2016
Type of sample		soil
Date prepared	-	07/09/2016
Date analysed	-	08/09/2016
Moisture	%	16

Asbestos ID - soils NEPM - ASB-001		
Our Reference:	UNITS	152971-1
Your Reference	---------- -	QC20160905-01A
Date Sampled	----------	5/09/2016
Type of sample		soil
Date analysed	-	8/09/2016
Sample mass tested	g	409.08
Sample Description	-	Brown coarse-grained soil & rocks
Asbestos ID in soil (as per AS4964)	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	Not applicable
ACM >7mm Estimation*	g	0.0000
FA and AF Estimation*	g	0.0000
ACM>7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*[#2]	%(w/w)	<0.001

Method ID	Methodology Summary
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.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			07/09/2016	[NT]	[NT]	LCS-4	07/09/2016
Date analysed	-			07/09/2016	[NT]	[NT]	LCS-4	07/09/2016
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-4	92%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-4	98%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-4	104%
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-4	88%
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-4	87%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(b,j +k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	LCS-4	108%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	88	[NT]	[NT]	LCS-4	109%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			07/09/2016	[NT]	[NT]	LCS-4	07/09/2016
Date analysed	-			07/09/2016	[NT]	[NT]	LCS-4	07/09/2016
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	LCS-4	111%
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	LCS-4	107%
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-4	109%
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-4	110%
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-4	104%
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	LCS-4	90%
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-4	102%
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-4	104%

Report Comments:

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Note: Sample analysed as received. However, sample 152971-1 is below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination)Measure, Schedule B1, May 2013.

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

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Page 1 of 1

152979

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047	LABORATORY BATCH NO.:
PROJECT NAME: Macquarie Park NSW	SAMPLERS: A. Finney . L. Blecher
DATE NEEDED BY: STD TAT	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) L.Blecher@jbsg.com.au; (3) A.Finney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Samples to be Scheduled by email.

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Heavy Metals	PAH	TPH/BTEX	Asbestos	OCPs/PCBs	Herbicides	OPP, CEC, pH	ASP/TCLP	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
①EC20160906-01/A	Soil	06/09	-	Bag, Jar, Ice		X		X		X			X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE: 06/09	CONSIGNMENT NOTE NO.	NAME:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE: OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO		COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Envirolab.

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52047
PROJECT NAME: Macquarie Park NSW
DATE NEEDED BY: STD TAT

LABORATORY BATCH NO.:
SAMPLERS: A. Finney . L. Blecher
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) L.Blecher@jbsg.com.au; (3) AFinney@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Samples to be scheduled by email.

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QC20160906-01/A	Soil	06/09	-	Bag, Jar, Ice				

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

Job No: 152979
Date Received: 6/9/16
Time Received: 16:00
Received by: JE
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: [signature] DATE: 06/09	CONSIGNMENT NOTE NO.	NAME: Keith Hay	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 6/9/16 14:00	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab.

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

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

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

CERTIFICATE OF ANALYSIS 152979

Client:

JBS & G (NSW & WA) Pty Ltd
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: L Blecher, A Finney

Sample log in details:

Your Reference:	**52047 - Macquarie Park**		
No. of samples:	1 soil		
Date samples received / completed instructions received	06/09/16	/	06/09/16

Analysis Details:

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

Report Details:

Date results requested by: / Issue Date:	13/09/16	/	9/09/16
Date of Preliminary Report:	Not Issued		

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

Results Approved By:

David Springer
General Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	152979-1
Your Reference	---------- -	QC20160906-01A
Date Sampled	----------	6/09/2016
Type of sample		soil
Date extracted	-	08/09/2016
Date analysed	-	09/09/2016
TRHC$_6$ - C$_9$	mg/kg	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	88

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	152979-1
Your Reference	---------- -	QC20160906-01A
Date Sampled	----------	6/09/2016
Type of sample		soil
Date extracted	-	08/09/2016
Date analysed	-	08/09/2016
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100
Surrogate o-Terphenyl	%	75

Organochlorine Pesticides in soil		
Our Reference:	UNITS	152979-1
Your Reference	----------	QC20160906-01A
	-	
Date Sampled	----------	6/09/2016
Type of sample		soil
Date extracted	-	08/09/2016
Date analysed	-	08/09/2016
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate TCMX	%	91

PCBs in Soil		
Our Reference:	UNITS	152979-1
Your Reference	----------	QC20160906-01A
	-	
Date Sampled	----------	6/09/2016
Type of sample		soil
Date extracted	-	08/09/2016
Date analysed	-	08/09/2016
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Surrogate TCLMX	%	91

Acid Extractable metals in soil		
Our Reference:	UNITS	152979-1
Your Reference	----------	QC20160906-01A
	-	
Date Sampled	----------	6/09/2016
Type of sample		soil
Date prepared	-	08/09/2016
Date analysed	-	08/09/2016
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	14
Copper	mg/kg	16
Lead	mg/kg	19
Mercury	mg/kg	<0.1
Nickel	mg/kg	18
Zinc	mg/kg	64

Moisture		
Our Reference:	UNITS	152979-1
Your Reference	----------	QC20160906-01A
	-	
Date Sampled	----------	6/09/2016
Type of sample		soil
Date prepared	-	08/09/2016
Date analysed	-	09/09/2016
Moisture	%	19

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Date analysed	-			09/09/2016	[NT]	[NT]	LCS-1	09/09/2016
TRHC$_{6}$ - C$_{9}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	100%
TRHC$_{6}$ - C$_{10}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	100%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-1	103%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-1	93%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	99%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-1	103%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	100%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	94	[NT]	[NT]	LCS-1	91%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Date analysed	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	104%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	104%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	110%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	104%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	104%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	110%
Surrogate o-Terphenyl	%		Org-003	81	[NT]	[NT]	LCS-1	100%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Date analysed	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	129%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	120%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	121%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	122%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	122%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	123%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	124%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	122%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	127%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	121%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	93	[NT]	[NT]	LCS-1	108%
QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Date analysed	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-1	96%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	93	[NT]	[NT]	LCS-1	93%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Date analysed	-			08/09/2016	[NT]	[NT]	LCS-1	08/09/2016
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	LCS-1	107%
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	LCS-1	109%
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-1	107%
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-1	107%
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-1	90%
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	LCS-1	114%
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-1	100%
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-1	101%

Report Comments:

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

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

Appendix F Statistical Analysis Outputs

UCL Statistics for Uncensored Full Data Sets		
52047 - TRHs >C16-C34 Fraction		
User Selected Options		
Date/Time of Computation	29/09/2016 4:09:21 PM	
From File	WorkSheet.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

C0

General Statistics

Total Number of Observations	17	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	50	Mean	140
Maximum	540	Median	50
SD	144.9	Std. Error of Mean	35.15
Coefficient of Variation	1.035	Skewness	1.987

Normal GOF Test

Shapiro Wilk Test Statistic	0.683	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.267	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.215	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	201.4	95% Adjusted-CLT UCL (Chen-1995)	215.9
		95% Modified-t UCL (Johnson-1978)	204.2

Gamma GOF Test

A-D Test Statistic	1.607	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.756	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.314	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.213	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.506	k star (bias corrected MLE)	1.28
Theta hat (MLE)	92.95	Theta star (bias corrected MLE)	109.4
nu hat (MLE)	51.21	nu star (bias corrected)	43.51
MLE Mean (bias corrected)	140	MLE Sd (bias corrected)	123.8
		Approximate Chi Square Value (0.05)	29.38
Adjusted Level of Significance	0.0346	Adjusted Chi Square Value	28.17

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	207.3	95% Adjusted Gamma UCL (use when n<50)	216.2

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.792	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.319	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.215	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level		
Lognormal Statistics		
Minimum of Logged Data	3.912	Mean of logged Data 4.574
Maximum of Logged Data	6.292	SD of logged Data 0.823
Assuming Lognormal Distribution		
95% H-UCL	222.4	90% Chebyshev (MVUE) UCL 218.3
95% Chebyshev (MVUE) UCL	257.1	97.5% Chebyshev (MVUE) UCL 311
99% Chebyshev (MVUE) UCL	416.8	
Nonparametric Distribution Free UCL Statistics		
Data do not follow a Discernible Distribution (0.05)		
Nonparametric Distribution Free UCLs		
95% CLT UCL	197.8	95% Jackknife UCL 201.4
95% Standard Bootstrap UCL	195.3	95% Bootstrap-t UCL 256.8
95% Hall's Bootstrap UCL	463.8	95% Percentile Bootstrap UCL 199.4
95% BCA Bootstrap UCL	213.5	
90% Chebyshev(Mean, Sd) UCL	245.4	95% Chebyshev(Mean, Sd) UCL 293.2
97.5% Chebyshev(Mean, Sd) UCL	359.5	99% Chebyshev(Mean, Sd) UCL 489.7
Suggested UCL to Use		
95% Chebyshev (Mean, Sd) UCL	293.2	
Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.		
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)		
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.		
For additional insight the user may want to consult a statistician.		

UCL Statistics for Uncensored Full Data Sets		
52047 - Carcinogenic PAHs as B(a)P TPE		
User Selected Options		
Date/Time of Computation	28/09/2016 6:32:27 PM	
From File	WorkSheet.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

C0

General Statistics

Total Number of Observations	15	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	0.605	Mean	0.956
Maximum	5.864	Median	0.605
SD	1.358	Std. Error of Mean	0.351
Coefficient of Variation	1.421	Skewness	3.873

Normal GOF Test

Shapiro Wilk Test Statistic	0.284	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.535	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.229	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	1.573	95% Adjusted-CLT UCL (Chen-1995)	1.907
		95% Modified-t UCL (Johnson-1978)	1.632

Gamma GOF Test

A-D Test Statistic	5.385	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.75	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.554	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.225	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	1.784	k star (bias corrected MLE)	1.472
Theta hat (MLE)	0.536	Theta star (bias corrected MLE)	0.649
nu hat (MLE)	53.53	nu star (bias corrected)	44.15
MLE Mean (bias corrected)	0.956	MLE Sd (bias corrected)	0.788
		Approximate Chi Square Value (0.05)	29.91
Adjusted Level of Significance	0.0324	Adjusted Chi Square Value	28.48

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	1.41	95% Adjusted Gamma UCL (use when n<50)	1.482

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.284	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.881	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.535	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.229	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	-0.503	Mean of logged Data	-0.351
Maximum of Logged Data	1.769	SD of logged Data	0.586
Assuming Lognormal Distribution			
95% H-UCL	1.174	90% Chebyshev (MVUE) UCL	1.215
95% Chebyshev (MVUE) UCL	1.392	97.5% Chebyshev (MVUE) UCL	1.637
99% Chebyshev (MVUE) UCL	2.118		
Nonparametric Distribution Free UCL Statistics			
Data do not follow a Discernible Distribution (0.05)			
Nonparametric Distribution Free UCLs			
95% CLT UCL	1.532	95% Jackknife UCL	N/A
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	2.007	95% Chebyshev(Mean, Sd) UCL	2.484
97.5% Chebyshev(Mean, Sd) UCL	3.145	99% Chebyshev(Mean, Sd) UCL	4.444
Suggested UCL to Use			
95% Chebyshev (Mean, Sd) UCL	2.484		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.

For additional insight the user may want to consult a statistician.

1	**UCL Statistics for Uncensored Full Data Sets**										
2	**52047-Benzo(a)pyrene**										
3	User Selected Options										
4	Date/Time of Computation	30/09/2016 9:28:03 AM									
5	From File	WorkSheet.xls									
6	Full Precision	OFF									
7	Confidence Coefficient	95%									
8	Number of Bootstrap Operations	2000									
9											
10											
11	**C0**										
12											
13	**General Statistics**										
14	Total Number of Observations	31				Number of Distinct Observations	2				
15						Number of Missing Observations	0				
16	Minimum	0.25				Mean	0.323				
17	Maximum	2.5				Median	0.25				
18	SD	0.404				Std. Error of Mean	0.0726				
19	Coefficient of Variation	1.253				Skewness	5.568				
20											
21	**Normal GOF Test**										
22	Shapiro Wilk Test Statistic	0.184				**Shapiro Wilk GOF Test**					
23	5% Shapiro Wilk Critical Value	0.929				Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic	0.539				**Lilliefors GOF Test**					
25	5% Lilliefors Critical Value	0.159				Data Not Normal at 5% Significance Level					
26	**Data Not Normal at 5% Significance Level**										
27											
28	**Assuming Normal Distribution**										
29	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**					
30	95% Student's-t UCL	0.446				95% Adjusted-CLT UCL (Chen-1995)	0.52				
31						95% Modified-t UCL (Johnson-1978)	0.458				
32											
33	**Gamma GOF Test**										
34	A-D Test Statistic	11.71				**Anderson-Darling Gamma GOF Test**					
35	5% A-D Critical Value	0.753				Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic	0.554				**Kolmogrov-Smirnoff Gamma GOF Test**					
37	5% K-S Critical Value	0.159				Data Not Gamma Distributed at 5% Significance Level					
38	**Data Not Gamma Distributed at 5% Significance Level**										
39											
40	**Gamma Statistics**										
41	k hat (MLE)	2.924				k star (bias corrected MLE)	2.663				
42	Theta hat (MLE)	0.11				Theta star (bias corrected MLE)	0.121				
43	nu hat (MLE)	181.3				nu star (bias corrected)	165.1				
44	MLE Mean (bias corrected)	0.323				MLE Sd (bias corrected)	0.198				
45						Approximate Chi Square Value (0.05)	136.4				
46	Adjusted Level of Significance	0.0413				Adjusted Chi Square Value	134.9				
47											
48	**Assuming Gamma Distribution**										
49	95% Approximate Gamma UCL (use when n>=50))	0.39				95% Adjusted Gamma UCL (use when n<50)	0.395				
50											
51	**Lognormal GOF Test**										
52	Shapiro Wilk Test Statistic	0.184				**Shapiro Wilk Lognormal GOF Test**					
53	5% Shapiro Wilk Critical Value	0.929				Data Not Lognormal at 5% Significance Level					
54	Lilliefors Test Statistic	0.539				**Lilliefors Lognormal GOF Test**					
55	5% Lilliefors Critical Value	0.159				Data Not Lognormal at 5% Significance Level					

56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59					Minimum of Logged Data	-1.386			Mean of logged Data	-1.312		
60					Maximum of Logged Data	0.916			SD of logged Data	0.414		
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	0.338			90% Chebyshev (MVUE) UCL	0.36		
64					95% Chebyshev (MVUE) UCL	0.39			97.5% Chebyshev (MVUE) UCL	0.432		
65					99% Chebyshev (MVUE) UCL	0.515						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71					95% CLT UCL	0.442			95% Jackknife UCL	N/A		
72					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL	N/A		
73					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL	N/A		
74					95% BCA Bootstrap UCL	N/A						
75					90% Chebyshev(Mean, Sd) UCL	0.54			95% Chebyshev(Mean, Sd) UCL	0.639		
76					97.5% Chebyshev(Mean, Sd) UCL	0.776			99% Chebyshev(Mean, Sd) UCL	1.045		
77												
78	**Suggested UCL to Use**											
79					95% Student's-t UCL	0.446			or 95% Modified-t UCL	0.458		
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												

Appendix G QA/QC Documentation

ESDAT QA Checker
Project:52047
Filter: SDG in('514702','514668')

Overview Summary
- Count of Samples
- Count of Results

Holding Times
- Holding Time Errors (0)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Storage Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Duplicates
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL (9)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (0)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (2)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (0)
- Trip Spike Recoveries (70% - 130% is acceptable) (18)

Inorganic
- Na + CL > TDS (0)
- BOD > COD (0)
- BOD > COD (0)

Other
- Unit Conversion Problems (0)
- OriginalChemNames Requiring Validation (0)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	SOIL	WATER
First Sample Date	5/09/2016	5/09/2016
Last Sample Date	6/09/2016	6/09/2016
Sampling Period (days)	2	2
Number of Samples Submitted	56	4
Number of Non QA Samples Submitted	54	0
Number of Field Blanks	0	0
Number of Trip Blanks	0	2
Number of Rinsates	0	2
Number of Field Duplicates	2	0
Number of Trip Spikes	0	2
Number of Lab Duplicates	12	0
Number of LCSs	21	12
Number of CRMs	0	0
Number of Method Blanks	22	12
Number of Storage Blanks	0	0
Number of Matrix Spikes	17	14
Number of Matrix Spike Dupes	0	0

Field Duplicates (SOIL)
Filter: SDG in('514702'

			SDG	514668	514668		514702	514702		514668	ENVIROLAB 2016-09-06T00:00:00		514702	ENVIROLAB 2016-09-06T00:00:00	
			Field ID	HA26 0-0.1m	QC20160905-01	**RPD**	HA03 0.0-0.1M	QC20160906-01	**RPD**	HA26 0-0.1m	QC20160905-01A	**RPD**	HA03 0.0-0.1M	QC20160906-01A	**RPD**
			Sampled Date/Time	5/09/2016	5/09/2016		6/09/2016	6/09/2016		5/09/2016	5/09/2016		6/09/2016	6/09/2016	
Chem_Grc	**ChemNam**	**Units**	**EQL**												
Metals & M	Arsenic (Tc	mg/kg	2 (Primary): 4 (Interlab)	**8.9**	**20.0**	**76.8**	**3.7**	**7.8**	**71**	8.9	12.0	30	3.7	5.0	30
	Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0
	Chromium	mg/kg	5 (Primary): 1 (Interlab)	23.0	32.0	**33**	**6.7**	**14.0**	**71**	23.0	25.0	8	**6.7**	**14.0**	**71**
	Copper	mg/kg	5 (Primary): 1 (Interlab)	**8.7**	**18.0**	**70**	**9.0**	**20.0**	**76**	8.7	11.0	23	**9.0**	**16.0**	**56**
	Lead	mg/kg	5 (Primary): 1 (Interlab)	12.0	16.0	29	16.0	20.0	22	12.0	14.0	15	16.0	19.0	17
	Mercury (Ir	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.1	0	<0.05	<0.1	0
	Nickel	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	**<5.0**	**17.0**	**149**	<5.0	2.0	22.2	**<5.0**	**18.0**	**151**
	Zinc	mg/kg	5 (Primary): 1 (Interlab)	17.0	27.0	**45**	47.0	57.0	19	17.0	20.0	16	47.0	64.0	**31**
etalloids															
Polycyclic .	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Anthracen	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Benz(a)ant	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Benzo(a)py	mg/kg	0.5 (Primary): 0.05 (Inter	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.05	0	<0.5		
	Benzo(a)py	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0	<0.5		
	Benzo(a)py	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0	0.6	<0.5	18	0.6		
	Benzo(a)py	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0	**1.2**	**<0.5**	**131**	1.2		
	Benzo(b,j)f	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		
	Benzo(g,h,	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Benzo(k)fl	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		
	Chrysene	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Dibenz(a,h	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Fluoranthe	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Fluorene	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Indeno(1,2	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Naphthaler	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5	<1.0	0
	Phenanthre	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	Pyrene	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.1	0	<0.5		
	PAHs (Tot	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5			<0.5		
romatic Hydrocarbons															
Chlorinated	Hexachlorc	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
l Benzenes															
Polychlorin	Aroclor 101	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
	Aroclor 122	mg/kg	0.1				<0.1						<0.1	<0.1	0
	Aroclor 123	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
	Aroclor 124	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
	Aroclor 124	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
	Aroclor 125	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
	Aroclor 126	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5						<0.5	<0.1	0
ated Biphenyls															
Organochl	4,4-DDE	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Aldrin	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Dieldrin	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	DDD	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	alpha-BHC	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	DDT	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	beta-BHC	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	delta-BHC	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Endosulfar	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Endosulfar	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Endosulfar	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Endrin	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Endrin alde	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Heptachlor	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Heptachlor	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Lindane	mg/kg	0.05 (Primary): 0.1 (Interlab)				<0.05						<0.05	<0.1	0
	Methoxych	mg/kg	0.2 (Primary): 0.1 (Interlab)				<0.2						<0.2	<0.1	0
rine Pesticides															
Asbestos	Approx. Sa	G		446.0	355.0	23	414.0	587.0	35	446.0			414.0		
	Asbestos fi	%w/w		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass ACM	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass Asbe	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Asbestos fi	%w/w		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass FA	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass Asbe	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass AF	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass Asbe	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
	Mass Asbe	G		0.0	0.0	0	0.0	0.0	0	0.0			0.0		
Asbestos	Synthetic F	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
Asbestos -	ACM - Con	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
	AF - Comn	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
	FA - Comn	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
	Organic Fil	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
	Respirable	COMMEN		1.0	1.0	0	1.0	1.0	0	1.0			1.0		
Trace Analysis															
Other	% Moisture	%	1	14.0	20.0	35	**24.0**	**14.0**	**53**	14.0			24.0		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Appendix H Calibration and Decontamination Documents

Field Equipment Calibration and Decontamination

PROJECT NAME:	Ivanhoe Estate	PROJECT NO:	52047
FIELD DATES:	5-6th September 2016.	FIELD STAFF:	AF + LB

CALIBRATION SUMMARY	
EQUIPMENT:	N/A
CALIBRATION STANDARD:	

DATE	TIME	READING (ppm_v)	COMMENTS
		N/A.	

DECONTAMINATION SUMMARY

EQUIPMENT: Hand Auger only.

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	(N) N	NA
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Nitrile gloves changed between each soil sample collected.

Document Distribution

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A	1x Electronic	Thomas Hurrell	30 September 2016

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Lindsey Blecher	Matthew Bennett	Matthew Bennett		30 September 2016

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