TRACE ENVIRONMENTAL

DETAILED SITE INVESTIGATION

1-31 Walter Street and 450-462 Willoughby Road Willoughby NSW

24 September 2019

Detailed Site Investigation

1-31 Walter Street and 450-462 Willoughby Road Willoughby NSW

Prepared for:
Walter Projects Pty Ltd

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Executive Summary

Walter Projects Pty Ltd (Walter Projects) engaged TRACE Environmental to undertake a Detailed Site Investigation (DSI) for the properties located at 1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW ('the site'). The site comprises 27 lots and is proposed for redevelopment for high density residential land use. The DSI was completed to assess the potential site contamination associated with current and historic land uses that may affect the suitability of the site for the proposed high density residential land use at the site.

Previous environmental investigations conducted at the site identified the potential for fill material to be present at the site, in addition to other potential sources of contamination, including former on-site and off-site commercial/industrial land uses and potential hazardous building materials. Previous investigations also identified some impacts in shallow soil exceeding applicable criteria in the eastern portion of the site.

Works completed as part of the DSI included the following:

- Review of available historical information for the site;
- Field investigations, including the following:
    - Advancing 26 soil bores across the site and installation of a groundwater monitoring well;
    - Sampling of three existing and one newly installed groundwater monitoring wells;
    - Laboratory analysis of soil and groundwater samples for contaminants of potential concern (COPCs) identified during previous environmental assessments and COPCs considered relevant to assessment of the site for the proposed land use;
- Development of a Conceptual Site Model (CSM) of the site.

Based on the findings of this DSI, the following summary and conclusions are provided:

- The majority of the site has historically been utilised for residential purposes, with the exception of the north-eastern portion of the site (462 Willoughby Road) which formally comprised part of a larger commercial/industrial property (possibly used for electrical goods and refrigerator manufacturing) from the 1950s to the 1970s/1980s;
- Fill material was encountered across the site to a maximum depth of 0.9 m below ground surface (bgs) during the current investigation, and up to 1.2 and 1.5 mbgs during previous investigations;
- Soil samples were analysed from 26 boreholes advanced across the site. Groundwater samples were collected from three existing (MW1 to MW3) and one newly installed (MW4) monitoring wells at the site. Groundwater was encountered in sandstone bedrock during drilling of MW4 at approximately 7 mbgs;
- The soil assessment identified benzo(a)pyrene TEQ, lead and/or asbestos exceeding human health screening criteria for the proposed high density residential land use and/or communal open space areas in soil samples at four locations. One soil sample collected during a previous investigation also reported benzo(a)pyrene TEQ above the human health screening criteria for high density residential and recreational/open space land uses;

- A number of soil samples collected across the site reported concentrations of TRH, copper, zinc and/or benzo(a)pyrene above the ecological assessment criteria for urban residential/public open space land uses, which may present a risk to future on-site ecological receptors;

- Metals were reported at concentrations exceeding the applicable groundwater guideline criteria in the analysed groundwater samples. The reported concentrations of metals in groundwater are likely due to elevated background conditions and are not considered to present a risk to future high density residential site users; and

- Due to the presence of buildings across most of the site, the investigated locations were limited to accessible areas of the site and assessment of the soil beneath the existing building footprints could not be completed. In addition, as asbestos was reported in soil exceeding the applicable guideline criteria. As such, further assessment at the site (including at building footprints following demolition) should be undertaken prior to site redevelopment. It is recommended that the additional investigation works be conducted as a Data Gap Investigation (DGI) following demolition and removal of the site buildings.

Based on the findings of the DSI, it is considered that the site can be made suitable for the proposed high density residential land use, subject to the following recommendations:

- A RAP should be prepared for the soil impacts identified at the site. The RAP should also outline the requirements for a DGI to further assess the site, including assessing areas beneath building footprints that were inaccessible during the current investigation. The RAP should also contain contingency measures to remediate/validate any additional impacted soil and/or asbestos finds that may be encountered during future investigation/remediation works;

- An Asbestos Clearance Inspection of the site surface should also be undertaken by a Licenced Asbestos Assessor on completion of demolition works and/or any remedial works that may be required (such as following remediation of any additional asbestos 'hotspots' of contamination that may be identified at the site following completion of the proposed DGI);

- The RAP should also include an unexpected finds protocol to address unexpected finds that may be encountered during site redevelopment works;

- A hazardous building materials survey of existing site structures should be completed prior to demolition works at the site. Any unexpected finds (including suspected ACM, if observed in soil) will require further investigation by a qualified environmental consultant;

- Any material to be removed off site must be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines*, and the soil be disposed appropriately to a facility licensed to accept the material; and

- Any imported material brought onto the site for any purpose must first be validated as being suitable for the intended land use, prior to being imported onto the site.

1 Introduction

TRACE Environmental was engaged by Walter Projects Pty Ltd (Walter Projects) to undertake a Detailed Site Investigation (DSI) for the properties located at 1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW ('the site'). The site comprises 27 lots[1] and is proposed for redevelopment for high density residential land use. A site locality plan is presented in **Figure 1** and a site plan is presented in **Figure 2**. The proposed development plans for the site are included in **Appendix A**.

This DSI was completed to assess the potential site contamination associated with current and historical land uses that may affect the suitability of the site for the proposed high-density residential land use at the site.

1.1 Site Background and Details of Proposed Development

The site currently comprises predominantly low to medium density residential properties, with a vacant lot in the north-east portion of the site, and covers an area of approximately 1.5 Ha. Based on the details provided by Walter Projects, it is understood that the planning proposal includes rezoning of the site from R3 (medium density residential) to R4 (high density residential), followed by the construction of a number of multi-storey residential buildings, which will include up to three levels basement car parking and communal open space areas.

Previous environmental investigations have been conducted at the site by Environmental Investigation Services (EIS) which are summarised below in **Section 2.10**. These investigations identified the potential for fill material to be present at the site, in addition to other potential sources of contamination, including former on-site and off-site commercial/industrial land uses and hazardous building materials. Additionally, the previous investigations identified PAHs and zinc exceeding applicable criteria in the eastern portion of the site.

The proposed development is also being conducted per the conditions of three development consent documents issued by Willoughby City Council (Council) as follows:

- Development Consent DA-2016/210 (W) for 5-9 Walter Street, Willoughby (Lot 1 DP 150607, Lot 2 DP 150607, Lot 3 DP 150607;
- Development Consent DA-2016/303 (D) for 11, 11A, 13 & 13A Walter Street, WILLOUGHBY (Lot 2 DP 590018, Lot 1 DP 590018, Lot 362 DP 1032203, Lot 361 DP 1032203; and
- Development Consent DA-2016/425 (D) for 21-27 Walter Street, Willoughby (Lot 1 and Lot 2 DP 166910, Lot 1 DP 168467, Lot 30 DP 977055.

Copies of the above referenced development consent documents are provided in **Appendix A**.

The conditions of consent relating to 'environmental and health protection' and/or 'health and safety' as noted in the above documents that are considered relevant to this DSI relate to the following conditions:

- An unexpected finds contingency plan should be incorporated into site redevelopment works. In the event that previously unidentified contaminated soils or materials are identified during site redevelopment, works

[1] Lot 2 DP586037, Lots 1 and 2 DP1161181, Lot 1 DP81135, Lot 1 DP75133, Lot 1 DP178525, Lots 11 and 12 DP129153, Lot 1 DP1084753, Lots 1 to 3 DP150607, Lots 1 and 2 DP590018, Lots 361 and 362 DP1032203, Lots 34 and 35 DP1037751, Lot 33 DP508777, Lot 1 DP1239384, Lots 1 and 2 DP166910, Lot 1 DP168467, Lot 30 DP977055, Lots 100 and 101 DP857252 and Lot 28 DP977055.

should cease in the immediate vicinity and the affected area isolated to minimise disturbance. A suitably qualified contaminated site consultant should be engaged to assess the degree, type and extent of contamination and establish a suitable remediation plan. The Site Manager/landowner shall notify Council in writing when they become aware of any contamination;

- All materials excavated and removed from the site (fill or natural) shall be classified in accordance with the Environment Protection Authority (EPA) Waste Classification Guidelines prior to being disposed of to a NSW approved landfill or to a recipient site.
- Following completion of the removal of any identified hazardous material associated with demolition works, a clearance certificate shall be issued by an appropriately qualified occupational hygienist and submitted to the Certifying Authority. The clearance certificate shall verify that the site is free from any hazardous materials from the demolished buildings; and/or
- Any material to be imported onto the site for levelling, construction or engineering purposes must satisfy the Office of Environment & Heritage (OEH) requirements for virgin excavated natural material (VENM) or excavated natural material (ENM). The determination of VENM or ENM must be made by suitable qualified consultant. Pre-certification of the imported material shall be made and details made available to Council upon request.

It is also noted that correspondence from Council[2] indicates that a 'Stage 2 Detailed Investigation report is required to send to the Department with the documentation requesting Gateway Determination'. TRACE Environmental understands that this request relates to the findings of historical investigations conducted at the site by EIS.

1.2 Objective

The objective of the DSI is to assess the contamination status of soil and groundwater at the site in the context of the proposed high density residential redevelopment, and to inform any further investigation and/or ongoing remedial or long-term management requirements that may be required.

This DSI was completed in general accordance with the National Environment Protection (Assessment of Site Contamination) Measure, Amendment 2013 (NEPM) and relevant NSW Environment Protection Authority (EPA) Guidelines.

1.3 Scope of Works

In order to achieve the objective, the following scope of works were undertaken:

- A review of historical information relating to the property from the following sources:
    - Existing environmental reports for the site;
    - NSW EPA administered environment management and contaminated land registers;
    - Registered groundwater bore database for groundwater bores in the vicinity of the site;

[2] Email from Jane Hosie (Council) to Mo Chehelnabi (Architecture Urbaneia), subject: *1-31 Walter St and 452-462 Willoughby Rd, Willoughby*, dated 16 August 2019.

- Acid Sulfate Soils (ASS) risk maps; and
- Available geological and hydrogeological information.

- Field investigations, including the following:
  - An inspection of the site to assist with the identification of potential sources of contamination and evaluate the general condition of the site in relation to potential contamination;
  - Drilling of one soil bore (SB1) using a Geoprobe drill rig, and hand auguring an additional 25 shallow soil bores (SB2 to SB26) across the site;
  - Installation of a groundwater monitoring well in the drilled borehole (MW4);
  - Collection of soil samples from 26 locations across the site and submission to a National Association of Testing Authorities (NATA) accredited laboratory for selected analysis of the contaminants of potential concern (COPCs) identified during previous environmental assessments and COPCs considered relevant to assessment of the site for the proposed land use. Analysed COPCs included total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN), heavy metals (arsenic, cadmium, copper, chromium, nickel, mercury and zinc), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), organochlorine pesticides (OCPs), organophosphorous pesticides (OPPs), volatile organic compounds (VOCs) and/or asbestos. Select soil samples were also analysed for electrical conductivity (EC) and/or pH;
  - Field screening of soil samples using a photo-ionisation detector (PID) for the potential presence of VOCs; and
  - Collection of groundwater samples from one newly installed (MW4) and three existing (MW1 to MW3) monitoring wells and submission to a NATA accredited laboratory for analysis of COPCs including dissolved heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEXN, PAHs, phenols, PCBs, OCPs, OPPs, VOCs and per- and poly-fluoroalkyl substances (PFAS).

- Completion of a field quality assurance (QA)/quality control (QC) program in accordance with NEPM (2013) requirements, including analysis of duplicate, triplicate, trip spike, trip blank and rinsate samples;
- Development of a conceptual site model (CSM) of the site based on the results of this investigation, outlining potential contamination sources and exposure pathways and receptors which may be impacted, and completion of a preliminary environmental risk assessment; and
- Provide conclusions and recommendations regarding the contamination status of the site and identify any further investigation, management and/or remediation at the site, if considered warranted.

1.4 Statutory and Regulatory Framework

Field activities and reporting were carried out in accordance with the following guidelines, regulations and standards:

- ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia;

- CRC CARE (2011) *Technical Report No. 10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater Part 1: Technical Development Document*, September 2011;
- CRC CARE (2011) *Technical Report No. 10, Health Screening Levels for petroleum hydrocarbons in soil and groundwater. Part 2: Application Document*, Dated September 2011;
- National Environmental Protection Council (NEPC), National Environmental Protection (*Assessment of Site Contamination*) Measure (NEPM), 1999, Amendment 2013;
- National Health and Medical Research Council (NHMRC) (2008) *Guidelines for Managing Risks in Recreational Water*;
- NEPM (2013) *Schedule B(1) Guideline on Investigation Levels for Soil and Groundwater*, NEPM, 1999, Amendment 2013;
- NEPM (2013) *Schedule B(2) Guideline on Site Characterisation*, NEPM, 1999, Amendment 2013;
- NHMRC (2018) *Australian Drinking Water Guidelines* (ADWG), Updated August 2018;
- NSW Department of Urban Affairs and Planning (1998) *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, August 1998;
- NSW EPA (1995) *Sampling Design Guidelines*, September 1995;
- NSW EPA (2015), *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act*. NSW EPA, September 2015;
- NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Ed.)*, October 2017;
- NSW OEH (2011), *Guidelines for Consultants Reporting on Contaminated Sites*. NSW Office of Environment & Heritage (OEH), November 1997, Reprinted September 2000 and August 2011;
- Standards Australia. *Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*, AS4482.1 (2005) and Part 2: Volatile substances, AS4482.2 (1999); and
- WA Department of Health (DoH) (2009), *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA DoH, May 2009.

2 Site Description and Setting

2.1 Site Identification

Details of the site are included in **Table 2-1**, below.

Table 2-1: Summary of Site Identification Details

ID Element	Description
Site Address	1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW
Lot/DP	Lot 2 DP586037, Lots 1 and 2 DP1161181, Lot 1 DP81135, Lot 1 DP75133, Lot 1 DP178525, Lots 11 and 12 DP129153, Lot 1 DP1084753, Lots 1 to 3 DP150607, Lots 1 and 2 DP590018, Lots 361 and 362 DP1032203, Lots 34 and 35 DP1037751, Lot 33 DP508777, Lot 1 DP1239384, Lots 1 and 2 DP166910, Lot 1 DP168467, Lot 30 DP977055, Lots 100 and 101 DP857252 and Lot 28 DP977055
Site Owner	Walter Projects Pty Ltd
Local Council	Willoughby City Council
Site Coordinates	-33.812063°, 151.198433° (approximate centre of site)
Approximate Site Elevation	60 m AHD
Approximate Site Area	1.5 Ha

A Site Locality Plan is presented in **Figure 1** and a Site Plan is presented in **Figure 2**.

2.2 Site Description

An initial site inspection was completed by TRACE Environmental on 22 August 2019. Details of the site, as observed during the inspection, are outlined in **Table 2-2** below. Site photographs are provided in **Appendix B**.

Table 2-2: Site Description

Category	Findings
Current Use and Users/Occupiers	The site comprises 16 single to three-story houses along Walter Street, six single-story houses along Willoughby Road and a vacant lot in the north-eastern portion of the site on Willoughby Road. The current users of the site are residents occupying the residences and visitors.
Future Use and Users/Occupiers	The proposed development comprises the construction of seven high density residential apartment buildings, which will include up to three levels of basement car parking and communal open space areas. Future site users will likely include construction workers during development of the site, the residents occupying future residences following site redevelopment, visitors and future maintenance workers.
Current Site Features	The site currently comprises 22 existing single story to three story brick or brick rendered residential houses along Walter Street and Willoughby Road (refer to **Photographs 3** to **7** of **Appendix B**). Some small garden sheds were observed in the rear of some properties, which may comprise asbestos containing material (ACM). Additionally, the north-eastern portion of the site (462 Willoughby Road) comprises vacant land (refer to **Photographs 1** and **2** of **Appendix B**). A concrete driveway runs east-west along most of the southern boundary of the lot, with the remaining site area being grassed. The central portion of the lot mounds slightly, with the edges of the mound generally sloping gently to the north, east and south. Some timber was observed in the south-eastern portion of this lot (refer to **Photograph 1** of **Appendix B**).

Category	Findings
Chemicals, raw materials and intermediate products storage and use	No evidence of chemicals, raw materials or intermediate products were observed on-site. No evidence of current or historical underground storage tanks (USTs) or above ground storage tanks (ASTs) (such as vent pipes, fill points, fuel dispensers, etc.) were observed at the site during inspection.
Waste Management	General residential/household waste is currently being generated and stored on site (trash bins) prior to off-site disposal. No hazardous waste is currently or is expected to be generated and/or stored on site.
Reported spills, chemical losses, discharges to land/water and/or incidents/accidents	No information pertaining to spills, chemical losses, discharges to land or water, and/or incidents/accidents was provided in previous investigations. The NSW EPA environmental register for contaminated land records[3] was accessed online on 30 August 2019. No notices or declarations under Section 58 of the CLM Act 1997 were listed for the site. In addition, a search of the public register under section 308 of the NSW POEO Act 1997 did not identify any licenses referring to the site, and a search of the *List of NSW Contaminated Sites Notified to the EPA* did not identify the site.
Surface covering/vegetation	At the time of the site inspection, the surface covering at the residential properties at the site included grass, paving, concrete and landscape gravels, with some garden areas. No significant areas of vegetation stress were identified at the site. The surface north of the north-eastern lot (462 Willoughby Road) was primarily grassed, except for a concrete driveway extending east-west along most of the southern boundary of the lot. Some trees are also present in this lot.
Electrical transformers/power generation	No electrical transformers are present on the site. The site is provided power via above ground services extending from Walter Street and Willoughby Road.
Topography and infilling	The topography of the site area generally slopes from the north to south, with a number of rock outcroppings visible in the rear of the residential property backyards. The central portion of 462 Willoughby Road is slightly mounded, which slopes to the north, east and south, and may be associated with filling of this area. However, it is noted that soil bores advanced at 462 Willoughby Road encountered fill material to a maximum depth of 0.5 mbgs (SB1) and encountered refusal in fill material on apparent sandstone bedrock at depths of between 0.15 and 0.2 mbgs (refer to **Figure 2** for borehole locations and **Appendix F** for borelogs). Given the natural site topography, it is considered that any filling during historical site levelling and landscaping of the residential properties at the site is likely to have utilised reworked site-sourced material.
Surface drainage	Surface water across the majority of the site is expected to drain toward the south and via gutters and pipes to a municipal storm water conveyance system.

2.3 Surrounding Land Use

At the time of the site inspection, the surrounding land uses comprised:

- North: Residential (apartments), childcare centre, television studios and associated satellite communications infrastructure;
- East: Willoughby Road with Bicentennial Reserve Oval and Hallstrom Park beyond;
- South: Walter Street with low density residential, Gore Hill Freeway and Flat Rock Creek beyond; and
- West: Reserve and residential beyond.

[3] http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx

A review of the surrounding land uses indicates a low potential for contaminating activities to have occurred at the off-site surrounding properties.

2.4 Surface Water Bodies

The nearest surface water body is Flat Rock Creek which is located between approximately 60 and 120 m south and 400 m west of the site, which eventually discharges into Sydney Harbour approximately 2 km to the east of the site. This surface water body is considered a likely potential receptor of site-specific groundwater impacts (if any).

2.5 Regional Geology & Hydrogeology

The Sydney 1:100,000 Geological Series Sheet 9130 (Ed 1) (Geological Survey of NSW, 1983) indicates that the site is situated on Hawkesbury Sandstone which typically consists of medium to coarse grained quartz sandstone with very minor shale and laminite lenses. This is consistent with the findings observed during borehole drilling at the site (refer to **Section 6.1** for details) and the geotechnical investigation conducted at a portion of the site by JC Geotechnical[4].

The depth to groundwater encountered during drilling of soil bore SB1 at the site was approximately 7 m below ground surface (bgs) within the sandstone bedrock.

2.6 Acid Sulfate Soils

A review of the Willoughby City Council Local Environmental Plan (LEP) 2012 Acid Sulfate Soils Map (Sheet ASS_004) shows the site is located in a Class 5 area. Class 5 ASS require development consent for works within 500 m of adjacent Class 1, 2, 3 or 4 land that is below 5 mAHD and by which the water table is likely to be lowered below 1 mAHD on adjacent Class 1, 2, 3 or 4 land.

A search of the ASRIS databases[5] indicates the site is located in an area of low probability of occurrence for ASS.

2.7 Registered Groundwater Bore Search

A groundwater bore search[6] was conducted on 30 August 2019 for the vicinity of the site, with no registered bores located within 500 m of the site.

2.8 EPA Records

The NSW EPA environmental register for contaminated land records was accessed online[7] on 30 August 2019. No notices or declarations under Section 58 of the CLM Act 1997 were listed for the site. In addition, a search

[4] JC Geotechnical Pty Ltd (2019) *Geotechnical Investigation Report, Nos. 3-31 Walter Street Willoughby NSW 2068*, 27 August 2019.

[5] http://www.asris.csiro.au

[6] https://realtimedata.waternsw.com.au

[7] https://apps.epa.nsw.gov.au/prclmapp/searchregister.aspx

of the public register under section 308 of the NSW POEO Act 1997 did not identify any licenses referring to the site, and a search of the *List of NSW Contaminated Sites Notified to the EPA* did not identify the site.

2.9 SafeWork NSW Storage of Hazardous Chemicals Register

A search of the Hazardous Chemicals Register was requested by EIS from SafeWork NSW for the property at 456 Willoughby Road. The results of the search (dated 8 July 2016) indicated no records pertaining to the site (refer to **Section 2.10** below for additional detail).

2.10 Previous Environmental Investigations

The following historical investigations relevant to the site were reviewed by TRACE Environmental:

- JBS&G (2013a) *Validation Report, Office of Strategic Lands within the Department of Planning and Infrastructure, Willoughby Road, Artarmon, NSW, 2064*, 29 October 2013;
- JBS&G (2013b) *Remedial Action Plan, Office of Strategic Lands within the Department of Planning and Infrastructure, Lot 2 DP586037 Willoughby Rd, Artarmon, NSW, 2064*, 27 September 2013;
- JBS&G (2015) *Review of Contamination Status – Lot 2 DP 586037, Willoughby Road, Artarmon, NSW*. 21 September 2015;
- EIS (2017) *Preliminary Desktop Environmental Site Assessment, 3-31 and 462 Willoughby Road, Willoughby, NSW*, 2 March 2017; and
- EIS (2018) *Preliminary Environmental Site Assessment, 1-1A Walter Street and 452-462 Willoughby Road, Willoughby, NSW*, 1 August 2018.

2.10.1 JBS&G (2013a, 2013b and 2015)

JBS&G conducted remediation and validation of asbestos impacted fill material at the property located at 462 Willoughby Road (Lot 2 DP586037) in 2013 (JBS&G 2013a). The objective of the remediation and validation works was to make the site suitable for proposed rezoning of the site to R3 Medium Density Residential under the Willoughby LEP 2012. The remediation and validation works were undertaken in accordance with a Remedial Action Plan (RAP) prepared for the site by JBS&G (2013b), which was prepared based on the identification of asbestos fibres in fill material in the north-eastern portion of the property during a Preliminary Site Investigation undertaken by JBS&G (2013c[8]).

Remediation works undertaken at the site included the excavation and off-site disposal of material in the vicinity of the asbestos impacted soil identified by JBS&G (2013c). Based on the absence of detectable asbestos in validation samples collected from the remedial excavation, and that ACM was not observed in the remedial excavation, JBS&G considered that the surface soils within the property were remediated and validated, and the site suitable for the proposed residential land use.

[8] JBS&G (2013c) *Preliminary Site Investigation. Department of Planning and Infrastructure, Willoughby Road, Artarmon, NSW, 2064*, February 2013. This report was not provided to TRACE Environmental for review.

JBS&G completed a review of the contamination status of 462 Willoughby Road in 2015[9] to determine if any changes in environmental factors/conditions had occurred since the previous assessment, remediation and validation works undertaken at the property (2013a, 2013b and 2013c). The scope of work included a review of background information and previous reports for the site, and a site inspection. Dumped building materials (including concrete, wood, metal fencing and a Willoughby Council green recycling bin) were present along the southern border of the site during the inspection, in addition to a small sand stockpile (<2m^3) observed against the eastern site fence, with a small amount of sand falling within the site. No asbestos was observed on site. Soil samples were collected from the stockpile and were analysed for heavy metals, TPH, BTEX, PAHs, OCPs, PCBs and asbestos. No analytes were reported above laboratory limits of reporting (LORs), except for some metals which were well below the adopted site and within background concentrations.

Based on the findings of the review, JBS&G (2015) considered that any widespread or gross contamination was unlikely to be present at the site and additional contamination investigations or management actions were not considered necessary for the site (in its condition at the time of reporting).

2.10.2 EIS (2017) and EIS (2018) Preliminary Environmental Site Assessments

EIS prepared Preliminary Environmental Site Assessments (ESAs) for planning proposals associated with the proposed high density residential developments at 3-31 Walter Street and 462 Willoughby Road (2017) and 1-1A Walter Street and 452-462 Willoughby Road (2018). The objectives of the Preliminary ESAs were to identify any past or present potentially contaminating activities at the site, and to identify the potential for site contamination. The scope of works completed for each site included review of site information (including background and site history information) and completion of a site inspection. Additionally, the scope of works presented in the EIS (2018) Preliminary ESA also included soil sampling undertaken during a previous investigation completed by EIS in 2016[10] at 450-460 Willoughby Road.

The investigations identified that the site has historically been utilised for residential purposes, except for 462 Willoughby Road which formerly comprised part of a larger commercial/industrial property (possibly electrical goods and refrigerator manufacturing) from the 1950s to the 1970s/1980s, following which the lot was vacant. Except for slag cobble identified in the eastern portion of 462 Willoughby Road and pieces of ash observed in some garden beds, the site walkover inspection did not identify any obvious potentially contaminating activities at the site. However, the potential for ACM to be present in on-site buildings was noted.

Based on the findings of the Preliminary ESAs, EIS identified the following potential contamination sources at the site:

- Historical import of fill material;
- Historical manufacturing of refrigerators and electrical goods (including off-site areas to the north); and
- Hazardous building materials.

[9] JBS&G (2015) *Review of Contamination Status – Lot 2 DP 586037, Willoughby Road, Artarmon, NSW*. 21 September 2015.

[10] EIS (2016) *Report to Greenwood Early Education Centres on Preliminary Environmental Site Assessment for Proposed Childcare Development at 1 and 1A Walter Street & 452-460 Willoughby Road, Willoughby NSW*, 30 June 2016. This report was not provided to TRACE Environmental for review.

The findings of the limited soil sampling undertaken at 450-460 Willoughby Road is summarised below:

- Fill material was identified to a maximum depth of approximately 1.2 mbgs, overlying natural clayey and sandy soils. Fill material was noted to be shallower in the western portion of the investigation area;
- Groundwater seepage was encountered in four of the five boreholes at depths between 0.5 and 1.1 mbgs;
- Carcinogenic PAHs were identified at concentrations above the adopted human health assessment criteria in fill material at one sampling location. The reported concentrations was considered to pose a potential risk to future site users and workers during the proposed site redevelopment; and
- Zinc was reported at a concentration above the adopted ecological assessment criteria in fill material at one sampling location. The reported concentration of zinc was not considered to pose an unacceptable ecological risk due to the urban site setting and location of nearby arterial roads, the absence of any existing vegetation stress and that the elevated concentration appeared to be confined to a relatively shallow surface layer of fill. It was noted by EIS (2018), however, that the elevated zinc concentration should be removed during construction of the proposed development.

Based on the findings of the 2017 and 2018 Preliminary ESAs, EIS considered that the historical land uses and potential sources of contamination identified would not preclude the proposed rezoning and future high density residential development at the site.

As part of the overall planning and development process, EIS recommended the following:

- Intrusive investigation be undertaken to assess the soil and groundwater conditions at the site;
- Screening for bulk landfill gasses be undertaken during borehole drilling in the eastern site area to close out any uncertainty regarding the filling history of the land to the east of the site;
- A hazardous building materials survey should be undertaken prior to demolition of the buildings. Following demolition of the buildings (and preferably prior to removal of the hardstand), an asbestos clearance certificate should be provided; and
- A waste classification should be undertaken prior to off-site disposal of any surplus materials to be excavated for the proposed basement construction and should include additional sampling within the proposed basement footprints.

Excerpts from the EIS (2017 and 2018) Preliminary ESAs are included in **Appendix C**.

2.11 Historical Data Review and Data Gap Assessment

Following review of the results of the above referenced documents, TRACE Environmental considers that the previous investigations undertaken at the site are adequate to assess the site history and potential historical sources of contamination at the site. However, the number of soil sampling locations investigated as part of the ESI (2018) Preliminary ESA were not undertaken in accordance with NSW EPA (1995) *Sampling Design Guidelines*, which recommends 25 sample locations for a site area of 1.5 Ha. Given that potential on-site and off-site sources of soil and groundwater contamination were identified during the EIS (2017 and 2018) investigations, and that elevated concentrations of COPCs were reported in limited soil sampling completed in

the eastern portion of the site, further intrusive investigations at the site are required to assess the suitability of the site for the proposed high density residential land use.

Additional detail and discussion of the findings of the current DSI, as well as the findings of historical reports conducted at the site, are outlined below in **Section 7**.

3 Data Quality

3.1 Data Quality Objectives

The NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*, which is endorsed by the NSW EPA under s105 of the Contaminated Land Management Act 1997, requires that Data Quality Objectives (DQOs) are to be adopted for all assessment and remediation programs. The DQO process as adopted by the NSW EPA is described within US EPA (2000) *Guidance for the Data Quality Objectives Process and Data Quality Objectives Process for Hazardous Waste Site Investigations*.

The DQOs for the site investigation, as detailed within NSW EPA (2017), are summarised in **Table 3-1**, below.

Table 3-1: Data Quality Objectives

Data Quality Objective	Description
Step 1 State the Problem	The site currently comprises 22 low to medium density residential properties and a vacant lot in the north-east of the site, and is proposed for redevelopment for high density residential purposes. Previous investigations undertaken at the site by EIS (2017 and 2018) identified the following potential contamination sources at the site: • Historical import of fill material; • Historical manufacturing of refrigerators and electrical goods (including off-site areas to the north); and • Hazardous building materials. Additionally, a previous limited soil investigation in the eastern portion of the site (450-460 Willoughby Road) identified PAHs in fill material at concentrations that may present a risk to future users of the proposed high density residential development. Zinc was also reported at a concentration above the adopted ecological assessment criteria in fill material at one sampling location. Additional soil and groundwater sampling is required at the site to provide an assessment of potential site contamination that may affect the suitability of the site for the proposed high density residential land use, and to inform further assessment and/or ongoing remedial or long-term management requirements that may be required. The results of the DSI will show the type, concentrations, and extent of potential contamination impacting the site, in exceedance of applicable guideline criteria (if any).
Step 2 Identify the Decisions	The decisions that must be made are: • Is the site potentially contaminated from historic land use/site activities? • What is the risk posed to potential on-site (and off-site) receptors from the concentrations of COPCs identified at the site (if any)? • Are site soils and/or groundwater suitable for the proposed high density residential land use from a land contamination perspective? • If not, is management and/or remediation of site soils and/or groundwater necessary to ensure the site is made suitable for the proposed high density residential land use?

Data Quality Objective	Description
Step 3 Identify Inputs to the Decision	The primary inputs to the decisions described above are: • Assessment of fill and natural soils, with samples collected from 26 locations across the site; • Ensuring a sufficient number of samples are collected at each sampling location to characterise site soils; • Collection of four groundwater samples from one newly installed and three existing monitoring wells; • Laboratory analysis of soil and groundwater samples for relevant COPCs, based on historical land use and potential contaminant sources; • Assessment of the analytical results against applicable guideline criteria, based on the current and proposed future land uses; • Assessment of the suitability of the analytical data obtained, against the Data Quality Indicators (DQIs); • Site physiology and features; and • Field observations including PID measurements, soil staining and waste materials (including ACM if observed).
Step 4 Define the Study Boundaries	The site is located at 1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW and comprises 27 lots. The lateral extent of the DSI is the site boundaries (as shown on **Figure 2**). The vertical extent of the DSI extends to the maximum depth of drilling (i.e. 9.3 mbgs).
Step 5 Develop a Decision Rule	The decision rules for the DSI include: • If the concentration of a soil or groundwater COPC in a sample is below the applicable guideline criteria, then no further assessment/remediation will be required with respect to that COPC; • If soil or groundwater COPCs exceed the applicable guideline criteria, the site will be deemed to potentially contain 'hot spots' of contamination; • If the 95% upper confidence limit (UCL) of a soil COPC is less than applicable guideline criteria, standard deviation is less than 50%, and no reported concentration is greater than 250% of criteria, then no further assessment/remediation will be required with respect to that COPC; and • If the concentration of a soil or groundwater COPC in a sample exceeds the applicable guideline criteria, additional works (e.g. remediation or quantitative risk assessment) may be required to minimise the risk.
Step 6 Specify Limits on Decision Errors	DQIs are used to assess the reliability of field procedures and analytical results. In particular, the DQIs are proposed within NSW EPA (2017) as being used to document and quantify compliance. DQIs are described as follows and are presented in **Table 3-2**, below: • **Completeness** – a measure of the amount of useful data (expressed as %) from a data collection activity; • **Comparability** – the confidence (expressed qualitatively) that data may be equivalent for each sampling and analytical event; • **Representativeness** – the confidence (expressed qualitatively) that data are representative of each media present on the site; • **Precision** – a quantitative measure of the variability (or reproducibility) of data; and • **Accuracy (bias)** – a quantitative measure of the closeness of reported data to the true rule. In addition, this step should include the following considerations to quantify tolerable limits: • If 95% UCLs are adopted for a particular soil COPC, a decision can be made based on a 95% probability that the 'true' arithmetic average contaminant concentration within the sampling area will not exceed the value determined by this method. Therefore, the limit on the decision error will be that there is a 5% probability that the calculated arithmetic average contaminant concentration may be incorrect; and • If the minimum soil sampling points required for site characterisation based on detected circular hot spots by using a systematic sampling pattern is adopted (Table A of NSW EPA 1995), a decision can be made based on a 95% confidence of detecting a hot spot of a particular diameter. Therefore, the limit on the decision error will be that there is a 5% probability that a hotspot of a particular diameter may not be detected.

Data Quality Objective	Description
Step 7 Optimise the Design for Obtaining Data	To achieve the DQOs and DQIs, the following sampling procedures will be implemented to optimise the design for obtaining data: • Primary, duplicate and triplicate soil and groundwater samples will be analysed at NATA accredited laboratories; • Field and laboratory QA/QC results will indicate reliability and representativeness of the data set; • Laboratory Limits of Reporting (LORs) will be below the applicable guideline criteria for the analysed COPC, where possible; • Applicable guideline criteria will be sourced from NEPM (2013) guidelines and other NSW EPA endorsed guidelines (as necessary); • Any soil aesthetic issues will be evaluated including areas of discolouration, odour and hazardous waste inclusions; • Soil samples were collected from a total of 26 boreholes advanced at the site to target potential areas of impact at the site; • Four groundwater monitoring wells were sampled at the site; • Soil and groundwater COPCs were selected based on a review of historic activities at the site; • Samples will be collected by suitably qualified and experienced environmental consultants; • Soil and groundwater samples were collected and preserved in accordance with relevant standards/guidelines; • Soil observations including odours, staining and PID readings will assist with selection of samples for laboratory analysis; and • Field and laboratory QA/QC procedures will be adopted and reviewed to indicate the reliability of the results obtained.

3.2 Data Quality Indicators

The following Data Quality Indicators (DQIs), referenced in Step 6 in **Table 3-1**, have been adopted in accordance with the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. The DQIs outlined in **Table 3-2** assist with decisions regarding the contamination status of the site, including the quality of the laboratory data obtained, and are also discussed in **Appendix D**.

Table 3-2: Data Quality Indicators

Data Quality Indicator	Frequency	Data Acceptance Criteria
Completeness		
Field documentation correct	All samples	All samples
Soil bore logs complete and correct	All samples	All samples
Suitably qualified and experience sampler	All samples	All samples
Appropriate lab methods and LORs	All samples	All samples
Chain of custodies (COCs) completed appropriately	All samples	All samples
Sample holding times complied with	All samples	All samples
Proposed/critical locations sampled	-	Proposed/critical locations sampled
Comparability		
Consistent standard operating procedures for collection of each sample. Samples should be collected, preserved and handled in a consistent manner	All samples	All samples
Experienced sampler	All samples	All samples
Climatic conditions (temp, rain etc.) recorded and influence on samples quantified (if required)	All samples	All samples
Consistent analytical methods, laboratories and units	All samples	All samples
Representativeness		
Sampling appropriate for media and analytes (appropriate collection, handling and storage)	All samples	All Samples
Samples homogenous	All samples	All Samples

Data Quality Indicator	Frequency	Data Acceptance Criteria
Detection of laboratory artefacts, e.g. contamination blanks	-	Laboratory artefacts detected and assessed
Samples extracted and analysed within holding times	All samples	-
Precision		
Blind duplicates (intra-laboratory duplicates)*	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Split duplicates (inter-laboratory duplicates)*	1 per 20 samples	<30% RPD (Inorganics) <50% RPD (Organics) No Limit RPD Result <10 × LOR
Laboratory duplicates	1 per 20 samples	<20% RPD Result > 20 × LOR <50% RPD Result 10-20 × LOR No Limit RPD Result <10 × LOR
Accuracy (Bias)		
Trip blanks	1 per sampling event	COPCs <LOR
Trip Spikes	1 per sampling event	70-130%
Surrogate spikes	All organic samples	50-150%
Matrix spikes	1 per 20 samples	70-130%
Laboratory control samples	1 per 20 samples	70-130%
Method blanks	1 per 20 samples	<LOR
Rinsate Blanks	1 per day of sampling	<LOR

*Including asbestos. Inconsistencies between primary, duplicate and/or triplicate samples analysed for asbestos would either be investigated or consider the highest results.

4 Adopted Assessment Criteria

To assess the relative level and significance of any detected COPCs, reference is made to an established environment and/or human health threshold level or criterion. These criteria are dependent mainly on the proposed use of the site, and the associated environmental and human health risk in both the long and short term. Given the proposed high density residential site redevelopment, site assessment criteria have been adopted for high density residential land use. In addition, based on the presence of basement car parking and communal open space areas at the site, site assessment criteria have also been adopted for commercial/industrial and recreational/open space land uses, respectively.

4.1 Soil Assessment Criteria

The soil analytical results collected during this investigation were compared to the following criteria:

- TRH and BTEXN:
    - NEPM (2013) Soil Health Screening Levels (HSLs) for Vapour Intrusion (VI) for low to high density residential land use (HSL A/B), recreational / open space (HSL C) and commercial/industrial (HSL D). Based on the soil characteristics recorded at the time of sampling, the sand HSLs are considered applicable at the site;
    - CRC CARE (2011) Soil HSLs for VI for Intrusive Maintenance Workers (Shallow Trench). Based on the soil characteristics recorded at the time of sampling, the sand HSLs are considered applicable at the site. These criteria are relevant for workers involved in shallow trenches to a maximum trench depth of 1 m;
    - CRC CARE (2011) Soil HSLs for Direct Contact for Intrusive Maintenance Workers; and
    - CRC CARE (2011) Soil HSLs for Direct Contact for Residential (High Density) and Recreational/Open Space.
- Heavy metals, PAHs, OCPs, OPPs, phenols and PCBs:
    - NEPM (2013) Health Investigation Levels (HILs) for soil contaminants for residential with minimal opportunities for soil access (HIL B), public open space (HIL C) and commercial/industrial (HIL D).
- Asbestos:
    - NEPM (2013) HSLs for asbestos contamination in soil for residential with minimal opportunities for soil access (HSL B), public open space (HSL C) and commercial/industrial (HSL D).

Given that the proposed development also includes garden areas/deep soil zones and open spaces on the site, the Ecological Screening Levels (ESLs) and Ecological Investigation Levels (ESLs) outlined in Schedule B1 of NEPM (2013) were also considered.

Aesthetic issues relating to soils (such as generation of odours and any discolouration of the soil as a result of contamination) will also need to be adequately addressed as outlined in the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)* and in accordance with Section 3.6 of Schedule B1 of NEPM (2013).

Summaries of methods and results of the soil investigation are included below in **Sections 5** and **6,** respectively. The soil analytical data for COPCs at the site is included in **Tables 1** and **2**.

4.2 Groundwater Beneficial Uses

This section details the applicable guideline criteria utilised as groundwater investigation levels (GILs) for comparison to the groundwater analytical data collected during this DSI. The GILs are utilised as initial screening values only to determine if there is potential risk to human health and the environment associated with the dissolved phase impacts. The adopted GILs were based on an evaluation of potential beneficial groundwater uses both on and off site. For the purposes of evaluating groundwater conditions at the site, a review of the potential on-site and off-site groundwater beneficial uses has been conducted. The results of the review are provided in **Table 4-1**.

Table 4-1: Groundwater Beneficial Uses

Beneficial Use		Likelihood of Use		Comment
		On site	Off site	
Aquatic Ecosystems	Groundwater	Nil	Likely	There are no aquatic ecosystems on site and none are anticipated after site redevelopment. Flat Rock Creek is located between approximately 60-120 m south and 400 m west of the site. Based on proximity to the site and topography, Flat Rock Creek is considered a potential receptor of groundwater impacts at the site (if any).
Human Uses	Potable Water	Unlikely	Unlikely	The site and surrounding suburb have an established reticulated water supply, and no registered domestic or consumption use groundwater bores were identified within 500 m of the site (refer to **Section 2.7**). However, given that the site is located within a residential area, as a conservative approach the results will be compared to the NEPM (2013) Drinking Water criteria.
	Primary/Secondary Contact/Recreation/ Aesthetic	Unlikely	Unlikely	The site and surrounding area have no rivers, creeks or other surface water bodies that would potentially be utilised for swimming and other recreational activities within a 500 m radius of the site. Additionally, no registered domestic or recreational use groundwater bores were identified within 500 m of the site (refer above to **Section 2.7**). Therefore, primary/secondary contact/recreation/aesthetic beneficial uses have not been considered for this DSI.
	Irrigation	Unlikely	Unlikely	Extraction of groundwater for irrigation purposes at the proposed site development is considered unlikely due to the location of the site in a metropolitan area. Furthermore, no registered irrigation use groundwater bores were identified within 500 m of the site (refer to **Section 2.7**). Therefore, irrigation beneficial uses have not been considered for this DSI.
	Stock Watering	Unlikely	Unlikely	Given that the site is located within the metropolitan area, it is unlikely that groundwater will be extracted for stock watering purposes. Furthermore, no registered stock watering groundwater bores were identified within 500 m of the site (refer to **Section 2.7**). Therefore, stock watering beneficial uses have not been considered for this DSI.
	Industrial Use	Unlikely	Unlikely	Given the surrounding land uses (i.e. residential, commercial and open space), potential off-site industrial use of groundwater in the vicinity of the site is considered unlikely. Therefore, industrial beneficial uses have not been considered for this DSI.
	Aquaculture	Unlikely	Unlikely	The nearest surface water body (i.e. Flat Rock Creek) is considered unlikely to be utilised for aquaculture.

Beneficial Use	Likelihood of Use		Comment
	On site	Off site	
Intrusive Maintenance/Trench/Excavation Worker	Potential	Potential	Groundwater was gauged at depths between approximately 2.4 and 4.2 mbgs in the four monitoring wells at the site and was encountered during drilling of monitoring well MW4 at a depth of approximately 7 mbgs. Given that the proposed development will include up to three levels of basement car parking, on-site subsurface activities as part of the future development of the site have the potential for workers to come in direct contact with groundwater and COPCs if it is impacted. Off-site sub-surface activities also have the potential for workers to come in direct contact with groundwater and COPCs if it is impacted.

4.3 Groundwater Investigation Levels

Based on **Table 4-1**, the potential exists for on-site and off-site sub-surface workers to come in direct contact with groundwater in the future. The groundwater analytical data have been compared to the following criteria to account for the most conservative use of groundwater on site and potential off-site uses:

- NEPM (2013) GILs, Drinking Water criteria;
- NEPM (2013) GILs, Maintenance of Aquatic (Freshwater) Ecosystems;
- NEPM (2013) Groundwater HSLs for VI for low to high density residential land use (HSL A/B), recreational/open space (HSL C) and commercial/industrial land use (HSL D);
- CRC CARE (2011) HSL for VI - Intrusive Maintenance Worker in a Shallow Trench;
- PFAS National Environmental Management Plan (NEMP) (2018)[11] Drinking Water health-based guidance values; and
- PFAS NEMP (2018) guideline values for 95% species protection - slightly to moderately disturbed systems, Freshwater aquatic ecosystems.

Given that groundwater was encountered within sand during drilling of boreholes, the sand HSLs for depth range 2 to <4m and 4m+ have been adopted for this DSI. The applicable guideline criteria with the groundwater analytical data are listed in **Tables 6** and **7**.

[11] The Heads of EPAs Australia and New Zealand (HEPA) (2018) *PFAS National Environmental Management Plan*, January 2018.

5 Field Program

The field program included an intrusive investigation to assess the subsurface conditions at the site. Soil samples were collected from 26 boreholes advanced across the site for laboratory analysis, and one groundwater monitoring well was installed and sampled with three existing monitoring wells during the DSI field activities. The sampling methodologies are outlined in the following sections.

5.1 Soil Sampling Program

The soil investigation program was undertaken by TRACE Environmental between 26 and 28 August 2019. All subsurface investigations were conducted with reference to the NEPM (2013) and NSW EPA guidelines, as necessary. A total of 26 soil bores (SB1 to SB26) were advanced across the site. Borehole locations are shown on **Figure 2**.

The NSW EPA (1995) *Sampling Design Guidelines* recommend 25 sample locations for a site area of 1.5 Ha. Based on the current and proposed site use, it is considered that the total number of investigation locations is sufficient to assess the subsurface conditions of material at the site. However, it is noted that the investigated locations were limited to accessible areas of the site and assessment of the soil conditions beneath the existing building footprints has not been completed (refer to **Section 8.2** for further detail).

The sampling methodology adopted for the TRACE Environmental soil investigation is detailed in **Table 5-1** below. Laboratory analytical results are discussed in **Section 6**, and laboratory analytical reports are provided in **Appendix E**.

Table 5-1: Summary of Soil Assessment Activities

Activities	Details
Soil Bores	One soil bore was advanced (SB1, refer to **Figure 2**) using a combination of manual hand auger, solid flight auger and air hammer by Epoca Drilling to a final depth of 7.3 mbgs. An additional 25 soil bores were advanced (SB2 to SB26, refer to **Figure 2**) across the site using manual hand auger to final depths between 0.1 mbgs (SB14) and 1.05 mbgs (SB8).
Field Logging	Logging of boreholes were conducted in general accordance with the Unified Soil Classification System. Soil materials were logged and the following information was recorded in the field: soil/rock type, colour, grain size, sorting, inclusions, moisture conditions, staining and observation of any anthropogenic material (e.g. odours and waste materials, including ACM). Descriptions were recorded on TRACE Environmental standard field log sheets for uniformity in descriptions, presentation and to aid in future interpretations.

Activities	Details
Soil Sampling Procedures	Soil samples were collected from SB1 from approximately: • the surface (0.2 and 0.5 m); • at one metre intervals; • at changes in lithology; • at evidence of contamination (e.g. odours, staining, waste inclusions) (if any); and • at areas of elevated PID readings (if any). Soil samples were generally collected from the remaining hand auger boreholes (SB2-SB26) from approximately: • the surface (0.1 to 0.2 m); • at half metre intervals; • at changes in lithology; • at evidence of contamination (e.g. odours, staining, waste inclusions) (if any); and • at areas of elevated PID readings (if any). Soil samples were manually collected by hand (protected by a nitrile glove) from the hand auger, or solid flight auger. Soil samples were collected in 250 mL jars supplied by the laboratory and were labelled and immediately stored on ice for transport to the laboratory. The soil analytical program is further discussed below in **Section 5.3**. Soil samples submitted for asbestos quantification were collected in laboratory supplied 500 mL plastic bags with a press ('Ziploc') seal. Sampling was generally completed considering methods recommended in Table 5 of WA DoH (2009), namely: • Each sampling location was visually inspected for suspected ACM; • Suspect asbestos material or construction debris (i.e., fill material), if observed, were targeted for sampling; • One sample collected at each sampling location; and • The whole sample was submitted for laboratory analysis as per the requirements of Section 4.1.8 of WA DoH (2009).
Field QC Samples	Field duplicates and triplicates of the soil samples were prepared in the field by collecting split samples of the same material from the same depth. Samples were not mixed or homogenised during collection or splitting. Samples for duplicate analyses were selected from sampling locations characterised by indicators of contamination, odour and/or elevated PID responses (if encountered). Additionally, trip blanks/trip spikes and rinsate samples were also analysed at the laboratory during soil sampling. Duplicates and triplicates were collected at the minimum rate of one per 20 primary samples analysed at the laboratory. A full discussion of the QA/QC procedures is included below in **Section 6.5** and **Appendix D**.
Sample Labelling, Storage and Transport	All samples were clearly labelled with a unique sample identification consisting of the date, sample location, depth of sample and sampler's initials. In the case of field duplicates and triplicates, sample containers were labelled in a manner that did not reveal which primary sample the duplicate or triplicate belonged to.
Field Screening for VOCs	Additional soil from each sample depth range was placed in a sealed plastic bag for field screening purposes. After waiting approximately 5 minutes for the sample and the headspace to equilibrate, the headspace in the bagged samples was assessed by a calibrated (100 ± 3 parts per million (ppm) isobutylene) PID with a 10.6 eV lamp to measure the presence of total VOCs. PID readings are included in the bore logs provided in **Appendix F**.
Decontamination	The hand auger was decontaminated between each borehole location, and a clean pair of disposable nitrile sampling gloves was used between collection of each sample. One rinsate water sample was collected each day of sampling and was submitted with the soil samples, with analysis of rinsate water associated with the hand auger.
Waste Disposal	Soil cuttings generated during drilling were reinstated in the soil bores, except for cuttings from soil bore SB1, which remained on site.

5.2 Groundwater Investigation Program

One borehole (SB1) advanced during the DSI was converted into a permanent groundwater monitoring well (MW4) and was sampled with three existing monitoring wells (MW1, MW2 and MW3) to determine the condition of groundwater at the site. The groundwater monitoring well locations are shown on **Figure 2**.

Groundwater sampling was undertaken on 2 September 2019 by a TRACE Environmental Scientist who is trained and experienced in the collection of environmental groundwater samples. All groundwater well installation work and investigations were conducted with reference to the NEPM (2013) Schedule B2 and relevant guidelines endorsed by NSW EPA. The sampling methodology adopted for the groundwater investigation conducted is detailed in **Table 5-2**, below.

Table 5-2: Groundwater Sampling Methodology

Activities	Details
Monitoring Well Construction	One newly installed monitoring well (MW4) was constructed using Class 18 uPVC 50 mm inside diameter machine threaded casing and 0.4 mm slotted screen and casing. Well construction, including screen lengths, was based on observations made during drilling. Once the well screen was installed, a filtered sand of 2 mm in diameter was introduced as a filter pack to reduce sediment infiltrating the well annulus. The filter pack was placed around the screened section of the well to between approximately 0.5 m above the top of the screen. Fine-grained bentonite pellets were placed above the sand filter pack around the well to approximately 0.5 m above the top of the filter pack and was slightly wetted to ensure an adequate seal was formed to prevent surface infiltration into the well. The annulus was subsequently backfilled using grout to approximately 0.1 mbgs. A well cap was then inserted and a steel gatic cover was installed flush mounted to the ground surface and secured with concrete at the top of the monitoring well to prevent tampering and damage. The bore logs are included in **Appendix F**.
Monitoring Well Development	The newly installed monitoring well was developed using a bailer as soon as practical following installation. The bailer was used to disturb the water column within the well annulus to remove any groundwater and well debris that may have been introduced during the installation process.
Monitoring Well Gauging	Measurement of the standing water level in the groundwater monitoring wells was undertaken prior to purging using an electronic interface probe. Groundwater gauging data is further discussed below in **Section 6.3** and is presented in the groundwater sampling logs in **Appendix F**.
Monitoring Well Purging	The four monitoring wells were purged prior to sampling using low-flow sampling equipment on 2 September 2019. Water quality parameters including temperature, electrical conductivity, dissolved oxygen, redox potential and pH were measured during purging using a calibrated water quality meter. Sampling was completed following the stabilisation of the water quality parameters. Post-purging water quality parameters and purging data is shown in **Appendix F**.
Monitoring Well Sampling	Sampling of the monitoring wells was completed using the same methods as for purging (i.e. low-flow sampling technique) and was completed following stabilisation of water quality parameters. Samples were collected into appropriate laboratory supplied sample containers. Samples collected for analysis for metals were first filtered through a 0.45 micron filter prior to being dispensed into an appropriate laboratory supplied sample container. All bottles were then sealed immediately using a Teflon lined cap, labelled and placed on ice.
Field QC Samples	Groundwater field duplicate and field triplicate samples were prepared in the field by collecting split samples from the same monitoring well. To meet the QA/QC program objectives, one duplicate was analysed at the laboratory for the COPCs and one triplicate sample was analysed at a secondary laboratory for the COPCs. A trip blank and trip spike sample were transported with the samples during the groundwater sampling and were also analysed at the laboratory.
Sample Labelling, Storage and Transport	All samples were clearly labelled with unique sample identification numbers consisting of the date, sample location and sampler's initials. In the case of field duplicates, sample containers were labelled so as to not reveal their purpose or sample location to the laboratory. All samples were kept chilled in an ice-filled esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures.

Activities	Details
Decontamination	During the gauging of monitoring wells, an interface probe was used. The interface probe was decontaminated prior to its use by scrubbing with potable water. New tubing was used to purge the monitoring well during sampling. No reusable equipment was used during groundwater sampling.
Waste Disposal	Water purged during monitoring well development and sampling was disposed on unsealed areas on site.

5.3 Soil Analytical Program

The collected soil samples were submitted for laboratory analysis of various COPCs potentially related to historical import of fill at the site and the current and historic site uses as reported in the EIS 2017 and 2018 reports. A summary of the overall soil analytical program is presented in **Table 5-3**, below.

Table 5-3: Summary of Soil Analytical Program

Analysis	Analytical Method	LORs (mg/kg)	# Primary Samples	# QA/QC Samples[1]
TRH F1 & F2, TPH C_6-C_{40}	LTM-ORG-2010	20 to 100	41	3
BTEXN	LTM-ORG-2150	0.1 to 0.5	41	3
PAHs	LTM-ORG-2130	0.5	41	3
Metals (As, Cd, Total Cr, Cu, Pb, Hg, Ni, Zn)	LTM-MET-3040	0.1 to 5	41	3
OCPs/OPPs	LTM-ORG-2220 LTM-ORG-2200	0.05 to 2	15	0
PCBs	LTM-ORG-2220	0.1	15	0
Phenols	LTM-ORG-2130	0.4 to 20	10	2
VOCs	LTM-ORG-2150	0.1 to 0.5	5	0
Asbestos	LTM-ASB-8020	0.01% to 0.001 %	26	1
pH (aqueous) or pH ($CaCl_2$)	LTM-GEN-7090	0.1 units	13	0
Electrical Conductivity	LTM-INO-4030	5 µS/cm	15	0

[1] Number of Duplicate/Triplicate pairs.

5.4 Groundwater Analytical Program

The collected groundwater samples were submitted for laboratory analysis of various COPCs potentially related to historic import of fill and the current and historic site uses as identified in the EIS 2017 and 2018 reports. A summary of the overall groundwater analytical program is presented in **Table 5-4**, below.

Table 5-4: Summary of Groundwater Analytical Program

Analysis	Analytical Method	LORs (mg/L)	# Primary Samples	# QA/QC Samples[1]
TRH Fraction F1 and F2 TPH C_6 to C_{40}	LTM-ORG-2010	0.1 to 0.02	4	1
BTEXN	LTM-ORG-2150	0.01 to 0.001	4	1
Polycyclic Aromatic Hydrocarbons	LTM-ORG-2130	0.001	4	1
Metals (As, Cd, Total Cr, Cu, Pb, Hg, Ni, Zn)	LTM-MET-3040	0.0001 to 0.005	4	1
OCPs/OPPs	LTM-ORG-2220 LTM-ORG-2200	0.0001 to 0.02	4	0
PCBs	LTM-ORG-2220	0.001	4	0
Phenols	LTM-ORG-2130	0.003 to 0.1	4	1
VOCs	LTM-ORG-2150	0.001 to 0.005	4	0
PFAS	LTM-ORG-2100	0.01 to 0.05 µg/L	4	0

[1] Number of Duplicate/Triplicate pairs.

6 Assessment Results

6.1 Site Specific Lithology

The soil profile encountered by TRACE Environmental during drilling of boreholes at the site is summarised below:

- Fill material comprising clayey/gravelly sand up to approximately 0.9 mbgs; overlying
- Natural material comprising clay/sandy clay; overlying
- Sandstone bedrock.

Concrete, tiles and/or brick fragments were identified in shallow fill material at several boreholes. No staining or odours were observed during borehole drilling, except for organic odour at SB13 (at the southern portion of the site). Field measured PID readings were 0.0 ppm, indicating a low likelihood for the presence of VOCs in the soil samples collected at the site. Borehole logs are provided in **Appendix F**. The depth of fill material encountered at the site is shown on **Figure 3**.

6.2 Soil Analytical Results

Soil analytical results for soil bore samples collected at the site, and comparison to relevant soil assessment criteria, are presented in **Tables 1** and **2**, and are summarised below.

- One or more heavy metals were reported at concentrations above laboratory LORs in all soil samples analysed. Lead was reported at a concentration above the NEPM (2013) HIL C criterion in soil sample SB8_0.1. Zinc and/or copper were reported at concentrations above the NEPM (2013) EILs for urban residential/public open space in soil samples SB8_0.1 (and the associated duplicate and triplicate samples QS2 and QS2A, respectively), SB8_0.6, SB17_0.1, SB19_0.1, QS3 (duplicate of primary sample SB21_0.05), SB24_0.1 and SB25_0.1;
- One or more PAHs were reported at concentrations above laboratory LORs in soil samples SB16_0.1, SB17_0.1, SB18_0.1, SB18_0.5, SB19_0.1, QS3A (duplicate of primary sample SB21_0.05) and SB25_0.1. Of these detections, benzo(a)pyrene TEQ exceeded the NEPM (2013) HIL B criterion in soil samples SB18_0.1 and SB18_0.5, and exceeded the NEPM (2013) HIL C criterion in soil sample SB19_0.1. Additionally, benzo(a)pyrene also exceeded the NEPM (2013) ESL for urban residential/public open space in soil samples SB17_0.1, SB18_0.1, SB18_0.5 and SB19_0.1;
- Concentrations of TPH/TRH compounds were reported above laboratory LORs, but below the soil assessment criteria, in soil samples SB4_0.1, SB7_0.5, SB10_0.5, SB11_0.6, SB15_0.1, SB15_0.4, SB16_0.1, SB18_0.1, SB18_0.5, SB19_0.1, SB20_0.1, SB23_0.1 and SB25_0.1. The reported concentration of TRH >C_{16}-C_{34} in soil sample SB13_0.6 exceeded the NEPM (2013) ESL for urban residential/public open space;
- Asbestos was reported in fibre cement at a concentration exceeding the NEPM (2013) HSL B, C and D criteria in soil sample SB2_0.1. Asbestos was not reported above the laboratory LOR in the remaining soil samples analysed, and no suspected ACM fragments were observed during sampling activities;
- OCPs were not reported at concentrations above laboratory LORs in the analysed soil samples, except for chlordane and heptachlor epoxide in soil sample SB10_0.1 and dieldrin in soil sample SB24_0.1. The

reported concentrations of OCPs in these samples did not exceed the applicable soil assessment criteria; and

- BTEX, OPPs, PCBs, phenols and VOCs were not reported at concentrations exceeding the laboratory LORs in the analysed soil samples.

The reported guideline exceedances are further discussed below in **Section 7** and the identified human health criteria exceedances are shown on **Figure 4**. Laboratory analytical reports and associated documentation are provided in **Appendix E**.

It is noted that, based on the reported concentrations of lead in soil samples SB5_0.1, SB8_0.1 and SB13_0.1, benzo(a)pyrene in soil samples SB18_0.1 and SB18_0.5, and nickel in soil sample QS3A (triplicate of primary sample), analysis of these samples for potential leachability was undertaken using the Toxicity Characteristic Leachability Procedure (TCLP). Results of the soil leachability analysis reported leachate concentrations below laboratory LORs for benzo(a)pyrene (SB18_0.1 and SB18_0.5) and nickel (QS3A), and leachable concentrations of 0.10, 0.11 and 0.62 mg/L for lead in soil samples SB5_0.1, SB8_0.1 and SB13_0.1, respectively. Analytical results of the leachate testing are provided in **Appendix E**.

6.3 Hydrogeological Conditions

Monitoring well MW4 was installed at the site on 26 August 2019. Groundwater well installation details are shown on the bore logs presented in **Appendix F**. Three existing monitoring wells (MW1 to MW3) at the site were also gauged and sampled. Details regarding the encountered site hydrogeological conditions are summarised in **Table 6-1**, below. Groundwater monitoring well locations are shown on **Figure 2**. Field-measured groundwater data and sampling logs are provided in **Appendix F**.

Table 6-1: Site Hydrogeology

Component	Description
Depth to Groundwater	Gauged between 2.369 mbtoc (MW1) and 4.226 mbtoc (MW3)
Non-aqueous phase liquid (NAPL)	No measurable NAPL was detected at the site
Inferred Flow Direction	Assumed to be toward the south based on site topography and location of surface water bodies
Water Bearing Unit	Natural weathered sandstone
Total Dissolved Solids	Between approximately 131 mg/L (MW1) and 397 mg/L (MW4)
Potential Groundwater Discharge Zones	The nearest surface water body is Flat Rock Creek which is located between approximately 60 and 120 m south and 400 m west of the site. Based on proximity to the site and relative location, Flat Rock Creek is considered a likely potential groundwater discharge zone.

Notes:
mbtoc: metres below top of casing

6.4 Groundwater Analytical Results

A summary of the laboratory analytical results for groundwater samples collected at the site during the TRACE Environmental DSI is presented below.

- One or more heavy metals were reported at concentrations above the laboratory LORs in the four groundwater samples collected at the site. The following criteria exceedances were noted:

- Cadmium, lead and/or nickel were reported at concentrations above the NEPM (2013) Drinking Water GILs in the groundwater samples collected from monitoring wells MW3 and MW4; and
- Cadmium, copper, lead, nickel and/or zinc were reported at concentrations above the NEPM (2013) Freshwater GILs in groundwater samples collected from all monitoring wells.

- With the exception of 2-propanone (acetone) which was reported at laboratory LOR in the groundwater sample collected from monitoring well MW1, VOCs were not reported above laboratory LORs in the analysed groundwater samples;
- One or more PFASs were reported at concentrations above the laboratory LORs, but below the groundwater assessment criteria, in the groundwater samples collected from monitoring wells MW1, MW2 and MW3; and
- TPH/TRH, BTEXN, PAHs, OCPs, OPPs, phenols and PCBs were not reported at concentrations above laboratory LORs in the analysed groundwater samples.

A summary of laboratory analytical data for groundwater samples collected at the site is presented in **Tables 6** and **7**, and guideline exceedances are further discussed below in **Section 7**. Laboratory analytical reports and associated documentation are provided in **Appendix E**.

6.5 Quality Assurance/Quality Control

The overall project QA/QC program included collection of duplicates, triplicates, rinsate samples, trip blank samples and trip spike samples, in addition to internal laboratory QA/QC. A summary of the results of the QA/QC results are included in the following sections, and the full QA/QC evaluation is in included in **Appendix D**.

A total of three intra-laboratory and inter-laboratory soil duplicates (QS-1 to QS-3 and QS-1A to QS-3A, respectively), and one intra-laboratory and inter-laboratory groundwater duplicate (QW-1 and QW-1A, respectively) were collected during this investigation. A summary of the QA/QC samples submitted for analysis of the COPCs is included in **Table 6-2**, below.

Table 6-2: Soil and Groundwater Duplicate/Triplicate Summary

Parent Sample	Date	Blind Duplicate	Blind Triplicate	Analysis
Soil				
SB1/MW4_0.2	26/08/2019	QS1	QS1A	TPH/TRH, BTEXN, PAH, metals, asbestos, phenols
SB8_0.1	27/08/2019	QS2	QS2A	TPH/TRH, BTEXN, PAH, metals, phenols
SB21_0.05	27/08/2019	QS3	QS3A	TPH/TRH, BTEXN, PAH, metals
Groundwater				
MW1	2/09/2019	QW1	QW1A	TPH/TRH, BTEXN, PAH, metals, phenols

The Relative Percent Difference (RPD) was calculated between the primary and QA/QC samples and are shown on **Table 3** for soil samples and **Table 8** for groundwater samples.

Standards AS 4482.1-1997, AS 4482.2-1999, AS/NZ 5667.1-1998, AS/NZ 5667.11-1998 and NEPM (2013) state that replicate and original sample RPDs should generally be within 30%. However, this variation can be expected to be higher for organic compounds than for inorganics. In addition, greater variation is observed

where low concentrations of analytes are present. Therefore, the following RPD acceptance criteria were adopted during this DSI:

- Inorganics – 30% RPD;
- Organics – 50% RPD; and
- If primary and/or duplicate concentration <10 × LOR – No Limit.

As shown on **Table 3** and **Table 8**, RPD exceedances were reported for metals in some soil samples and groundwater samples. However, based on review of the RPDs and analytical results, the RPDs outside of the acceptance criteria are not considered to affect the interpretation of results and outcome of this DSI (refer to **Appendix D** for further detail).

6.5.1 Laboratory QA/QC

The chosen analytical laboratories undertake internal QA/QC procedures which include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery. Additionally, laboratory QA/QC procedures include sample receipt, logging, storage, preservation and analysis within the method specified holding time. The full review of the laboratory QA/QC program is included in **Appendix D**. A review of the laboratory QA/QC procedures indicated that the laboratory QA/QC samples were generally within the laboratory recommended range for acceptable reproducibility, with some exceptions. However, the laboratory QA/QC sample percent recoveries reported outside of the acceptance criteria were not considered to affect the outcomes of this DSI (refer to **Appendix D** for further detail). Additionally, samples were received and stored appropriately, and all samples were analysed within the specified holding time. Laboratory analytical reports and associated documentation are provided in **Appendix E**.

6.5.2 Data Useability

Assessment of the field and laboratory QA/QC procedures and results indicates that the DQOs were met and therefore that the analytical data is considered representative of site conditions at the time of the investigation and suitable to enable an investigation of the site. The majority of internal laboratory QA/QC procedures were met. The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of these investigation works. It is concluded that overall the quality of the analytical data produced is reliable for the purposes of this DSI.

7 Conceptual Site Model and Risk Assessment

The environmental risk assessment is based on a contaminant (source) - exposure pathway - receptor methodology. This relationship allows an assessment of potential environmental risk to be determined, in accordance with the current national guidelines. Central to the requirements for the assessment of risk is the development of an initial CSM, identifying each contaminant source and the associated receptor exposures.

Generally, a CSM provides an assessment of the fate and transport of COPCs relative to site-specific subsurface conditions with regard to their potential risk to human health and the environment. The CSM takes into account site specific factors including:

- Sources of subsurface impacts;
- Identification of COPCs derived from the sources;
- Vertical and lateral distribution of COPCs including presence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL);
- Site specific lithologic information including soil type(s), depth to groundwater, effective porosity, and groundwater flow velocity; and
- Actual or potential receptors focusing on future and current land use both of the site and adjacent properties and sensitive ecological receptors.

Based on the information sourced in this site validation, a CSM has been developed and is outlined in **Table 7-1**, below. Additional details are included in the sections that follow as necessary.

Table 7-1: Conceptual Site Model

Item	Description
Site History/Contaminant Sources	The majority of the site has historically been utilised for residential purposes, except for the north-eastern lot (462 Willoughby Road), which formally comprised part of a larger commercial/industrial property (possibly used for electrical goods and refrigerator manufacturing) from the 1950s to the 1970s/1980s. Potential contaminant sources at the site include historical importation of fill material, historical commercial/industrial use of the north-eastern portion of the site (and off-site adjoining properties to the north) and hazardous building materials in existing site structures.
Site Current and Future Use	The site currently comprises 22 residential houses along Walter Street and Willoughby Road, and a vacant lot in the north-eastern portion of the site. The site is being redeveloped for high density residential land use and will include up to three level basement car parking and communal open space areas.
Site Geology	The soil profile encountered during site works completed by TRACE Environmental comprised clayey/gravelly sand fill material up to approximately 0.9 mbgs, overlying natural clayey soils and sandstone bedrock. The intrusive investigations undertaken at the site by EIS (2018) and JC Geotechnical (2019) identified fill material to depths of up to 1.2 and 1.5 mbgs, respectively.
Site Hydrogeology	The depths to groundwater in monitoring wells MW1 to MW4 were gauged between 2.369 mbtoc (MW1) and 4.226 mbtoc (MW3). Groundwater was encountered at a depth of approximately 7 mbgs within the sandstone bedrock during drilling of borehole SB1. Based on site topography and the location of nearby surface water bodies, groundwater is inferred to flow toward the south.

Item	Description
COPCs - Soil	COPCs associated with imported fill materials and historical commercial/industrial land uses, including TPH/TRH, BTEXN, PAH, pesticides, PCBs, heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), VOCs, phenols and/or asbestos.
COPCs - Groundwater	COPCs associated with imported fill materials and historical commercial/industrial land uses, including TPH/TRH, BTEXN, PAH, pesticides, PCBs, heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), VOCs, PFAS and/or phenols.
COPCs - Soil Vapour	Volatile COPCs were not identified in soil or groundwater samples collected during the current investigation. Therefore, based on current available information it is considered unlikely that vapour issues are unlikely to be present at the site.
Extent of Impacts - Soil	Soil samples collected at the site reported concentrations of lead, benzo(a)pyrene TEQ and/or asbestos exceeding the human health screening criteria for high density residential and/or recreational/open space in soil samples collected at SB2, SB8, SB18 and SB19 (refer to **Figure 4**). Additionally, soil samples collected in the eastern portion of the site by EIS (2018) reported benzo(a)pyrene TEQ at a concentration exceeding the NEPM (2013) HIL B and C criteria and zinc at a concentration exceeding the NEPM (2013) EIL criterion for urban residential/open space. A number of soil samples collected across the site also reported concentrations of TRH, copper, zinc and/or benzo(a)pyrene above the ecological assessment criteria for urban residential/public open space land uses. Refer to **Section 7.1** below for additional discussion.
Extent of Impacts - Groundwater	Cadmium, lead and/or nickel were reported at concentrations above the NEPM (2013) Drinking Water GILs in the groundwater samples collected from monitoring wells MW3 and MW4.Additionally, cadmium, copper, lead, nickel and/or zinc were reported at concentrations above the NEPM (2013) Freshwater GILs in groundwater samples collected from all monitoring wells sampled. The remaining analysed COPCs did not exceed the laboratory LORs and/or site assessment criteria in groundwater samples collected.
Extent of Impacts - Soil Vapour	Given that no volatile COPCs were identified during the current investigation, it is considered unlikely that vapour issues are present at the site.
Potential Human Receptors	Current and future potential human receptors are considered to be site workers/construction workers, future residents, site visitors and intrusive maintenance workers.
Potential Environmental Receptors	There are no existing sensitive ecological receptors on site. Based on site development plans, deep soil planting zones are proposed at the site (refer to **Appendix A**). The closest surface water body to the site is Flat Rock Creek, located between approximately 60 and 120 m south and 400 m west of the site.

7.1 CSM Discussion and Summary

The site currently comprises 22 residential houses along Walter Street and Willoughby Road, with a vacant lot in the north-eastern portion of the site, and is proposed for redevelopment for high density residential land use. The development will also include up to three levels of basement car parking and communal open space areas.

The majority of the site has historically been utilised for residential purposes, except for the north-eastern lot (462 Willoughby Road) which formally comprised part of a larger commercial/industrial property (possibly used for electrical goods and refrigerator manufacturing) from the 1950s to the 1970s/1980s.

The results of the soil investigation undertaken at the site identified concentrations of lead, benzo(a)pyrene TEQ and/or asbestos exceeding the human health screening criteria for high density residential and/or recreational/open space in soil samples collected at SB2, SB8, SB18 and SB19 (refer to **Figure 4**). Additionally, the limited soil investigation undertaken in the eastern portion of the site by EIS (2018) reported benzo(a)pyrene TEQ at a concentration exceeding the NEPM (2013) HIL B and C criteria (refer to **Appendix C**). The identified human health criteria exceedances may present a health risk to future site users in the

vicinity of these locations and the extent of the identified soil impacts at SB2, SB8, SB18, SB19 and EIS (2018) location BH1 should be remediated, with an appropriate remedial and/or management strategy for these impacts to be outlined in a RAP (refer to **Section 7.2** for additional detail).

Soil samples collected across the site also reported concentrations of TRH, copper, zinc and/or benzo(a)pyrene above the ecological assessment criteria for urban residential/public open space land uses. In addition, EIS (2018) identified zinc at a concentration exceeding the NEPM (2013) EIL criterion for urban residential/open space at one location in the eastern portion of the site (refer to **Appendix C**). These exceedances should be considered in the overall site redevelopment, with an appropriate remedial and/or management strategy for these impacts be outlined in a RAP (refer to **Section 7.2** for additional detail).

No COPCs were reported at concentrations exceeding the applicable guideline criteria in the groundwater samples collected from the sampled monitoring wells, except for cadmium, copper, lead, nickel and/or zinc which were reported at concentrations above the NEPM (2013) Drinking Water and/or Freshwater GILs. As no other COPCs were reported at concentrations exceeding the laboratory LORs and/or applicable GILs in the analysed groundwater samples and given the location of the site in an urban setting, the reported metals concentrations are likely attributable to elevated background conditions. In addition, given that the site and surrounding suburb have an established reticulated water supply, that no registered domestic or consumption use groundwater bores were identified within 500 m of the site, and that extraction of groundwater for drinking purposes is not proposed as part of the site redevelopment, it is considered that the reported exceedances of NEPM (2013) Drinking Water GILs in monitoring wells MW3 and MW4 and does not affect the suitability of the site for the proposed high density residential land use.

The EIS (2017 and 2018) Preliminary ESAs noted that the recreational/open space land to the east of the site (beyond Willoughby Road, known as 'Bicentennial Reserve Oval') formerly comprised a quarry and recommended that screening for bulk landfill gasses be undertaken during borehole drilling in the eastern portion of the site to close out any uncertainty regarding the filling history of the off-site properties to the east. However, the likelihood for putrescible waste to have been used to fill these areas is considered to be low based on the following:

- A review of the NSW EPA environmental register for contaminated land records, the public register under section 308 of the NSW POEO Act 1997 and the *List of NSW Contaminated Sites Notified to the EPA* did not identify any entries registered for these properties;
- A search of the Willoughby City Council website identified that "*[Bicentennial Reserve] was claimed in 1933 as a 'garbage destructor and sewerage dump' for the community's waste. In 1934 the reverberatory incinerator designed by Walter Burley Griffin opened and material from the waste operation was used to fill the Flat Rock Creek valley and create level areas for playing fields. After 1983 more fill was added to create a regional park*";
- The Environmental Risk and Planning Report prepared by Lotsearch (as provided in EIS 2017 and 2018) did not identify these properties on the Australian Government Department of Environment and Energy National Waste Management Database;
- Review of available aerial photographs provided in the Environmental Risk and Planning Report prepared by Lotsearch (as provided in EIS 2017 and 2018) showed the playing field area that comprises the present-day Bicentennial Reserve Oval as a relatively consistent level open space area in the 1943, 1956, 1961, 1965, 1970 and 1982 aerial photographs (i.e. with no evidence of filling noted). The 1991 aerial photograph

also shows the entire reserve area as bare ground which appeared to be in the process of redevelopment as a regional park (and generally consistent with the information obtained from the Willoughby City Council website information identified above);

- No olfactory evidence of landfill gasses (e.g. methane, H_2S or leachate odours) was noted during borehole drilling at the site; and
- No evidence of landfill/whirlybird vents were observed along Willoughby Road that could indicate possible of landfill gasses originating at the off-site property to the east of Willoughby Road.

In consideration of the above, monitoring of landfill gasses during borehole drilling was not considered necessary during the current investigation. It is noted, however, that an unexpected finds protocol (UFP) should be prepared for the site should that include details pertaining to evidence of potential landfill wastes/odours/gasses that may be identified during site redevelopment works.

7.2 Data Gaps and Uncertainties

Given the potential for ACM and other hazardous building materials (such as lead paint) to be present in on-site buildings, a hazardous building materials survey of existing site structures should be completed prior to demolition of any structure.

The number of soil sampling locations investigated as part of the current DSI was undertaken in accordance with NSW EPA (1995) *Sampling Design Guidelines*, which recommends 25 sample locations for a site area of 1.5 Ha. However, due to the presence of buildings across most of the site, the investigated locations were limited to accessible areas of the site and assessment of the soil conditions beneath the existing building footprints could not be completed. In addition, as asbestos was reported in soil exceeding the applicable guideline criteria, and potential ACM may be present in the on-site structures, there is considered to be a 'known' likelihood for asbestos to be present at the site. In accordance with the WA DoH 2009 guidelines for asbestos investigation, the suggested investigation regimen for areas where asbestos has been identified is twice the number of sampling points required for site characterisation as outlined in the NSW EPA (1995) *Sampling Design Guidelines.* Therefore, further assessment at the site, including beneath the current building footprints, should be undertaken prior to site redevelopment. It is recommended that the additional investigation works be conducted as a Data Gap Investigation (DGI) following demolition and removal of the site buildings. The requirements for the DGI can be outlined in the proposed RAP that is required to address the above referenced shallow soil impacts.

The conditions of consent issued by Council (**Appendix A**) also state that, '*following completion of the removal of any identified hazardous material associated with demolition works, a clearance certificate shall be issued by an appropriately qualified occupational hygienist and submitted to the Certifying Authority*'. As such, an Asbestos Clearance Inspection of the site surface should be undertaken by a Licenced Asbestos Assessor (LAA) on completion of demolition works and/or any remedial works that may be required (such as following remediation of any additional asbestos 'hotspots' of contamination that may be identified at the site following completion of the proposed DGI).

The RAP should also include a UFP to address unexpected finds that may be encountered during site redevelopment works and as required by the conditions of consent issued by Council (**Appendix A**). The UFP should also provide details for the investigation of any potential landfill wastes or landfill odours that may be encountered during redevelopment works.

Refer to **Section 8.2** below for additional recommendations.

8 Conclusions and Recommendations

8.1 Summary and Conclusions

Based on the findings of this DSI, TRACE Environmental provides the following summary and conclusions:

- The site currently comprises 22 residential houses and a vacant lot in the north-eastern portion of the site, and is proposed for redevelopment for high density residential land use. The development will also include up to three levels of basement car parking and communal open space areas;
- The majority of the site has historically been utilised for residential purposes, with the exception of the north-eastern portion of the site (462 Willoughby Road) which formally comprised part of a larger commercial/industrial property (possibly used for electrical goods and refrigerator manufacturing) from the 1950s to the 1970s/1980s;
- Fill material was encountered across the site to a maximum depth of 0.9 mbgs. Previous investigations undertaken at the site by EIS (2018) and JC Geotechnical (2019) identified fill material to depths of up to 1.2 and 1.5 mbgs, respectively;
- A total of 41 primary soil samples were analysed from 26 boreholes advanced across the site;
- One of the soil bores advanced during this investigation was completed as a permanent groundwater monitoring well (MW4) and was developed, gauged, purged and sampled. Three existing groundwater monitoring wells (MW1 to MW3) were also gauged and sampled. Groundwater was encountered in sandstone bedrock during drilling of MW4 at approximately 7 mbgs;
- The soil assessment identified benzo(a)pyrene TEQ, lead and/or asbestos exceeding human health screening criteria for the proposed high density residential land use and/or communal open space areas in soil samples at four locations. One soil sample collected during a previous EIS (2018) investigation in the eastern portion of the site also reported benzo(a)pyrene TEQ above the human health screening criteria for high density residential and recreational/open space land uses;
- A number of soil samples collected across the site reported concentrations of TRH, copper, zinc and/or benzo(a)pyrene above the ecological assessment criteria for urban residential/public open space land uses, which may present a risk to future on-site ecological receptors;
- Metals were reported in the analysed groundwater samples at concentrations exceeding the GILs. The reported concentrations of metals in groundwater at the site are likely due to elevated background conditions and are not considered to present a risk to future high density residential site users; and
- Due to the presence of buildings across most of the site, the investigated locations were limited to accessible areas of the site and assessment of the soil beneath the existing building footprints could not be completed. In addition, as asbestos was reported in soil exceeding the applicable guideline criteria. As such, further assessment at the site (including at building footprints following demolition) should be undertaken prior to site redevelopment. It is recommended that the additional investigation works be conducted as a DGI following demolition and removal of the site buildings. The requirements for the DGI should be outlined in the proposed RAP.

Based on the findings of the DSI, it is considered that the site can be made suitable for the proposed high density residential land use, subject to the recommendations outlined below in **Section 8.2**.

8.2 Recommendations

Based on the findings of the DSI, TRACE Environmental provides the following recommendations:

- A RAP should be prepared for the soil impacts identified at the site. The RAP should also outline the requirements for a DGI to further assess the site, including assessing areas beneath building footprints that were inaccessible during the current investigation. The RAP should also contain contingency measures to remediate/validate any additional impacted soil and/or asbestos finds that may be encountered during future investigation/remediation works;
- An Asbestos Clearance Inspection of the site surface should also be undertaken by a Licenced Asbestos Assessor on completion of demolition works and/or any remedial works that may be required (such as following remediation of any additional asbestos 'hotspots' of contamination that may be identified at the site following completion of the proposed DGI);
- The RAP should also include an unexpected finds protocol to address unexpected finds that may be encountered during site redevelopment works;
- A hazardous building materials survey of existing site structures should be completed prior to demolition works at the site. Any unexpected finds (including suspected ACM, if observed in soil) will require further investigation by a qualified environmental consultant;
- Any material to be removed off site must be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines*, and the soil be disposed appropriately to a facility licensed to accept the material; and
- Any imported material brought onto the site for any purpose must first be validated as being suitable for the intended land use, prior to being imported onto the site.

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10 Limitations

This report has been prepared for Walter Projects Pty Ltd and for the specific purpose to which it refers. No responsibility is accepted to any third party and neither the whole of the report or any part or reference thereto may be published in any document, statement or circular nor in any communication with third parties without our prior written approval of the form and context in which it will appear.

TRACE Environmental has used a degree of skill and care ordinarily exercised by reputable members of our profession practicing in the same or similar locality. The conclusions presented in this report are relevant to the conditions of the site and the state of legislation currently enacted as at the date of this report. We do not make any representation or warranty that the conclusions in this report were applicable in the future as there may be changes in the condition of the site, applicable legislation or other factors that would affect the conclusions contained in this report.

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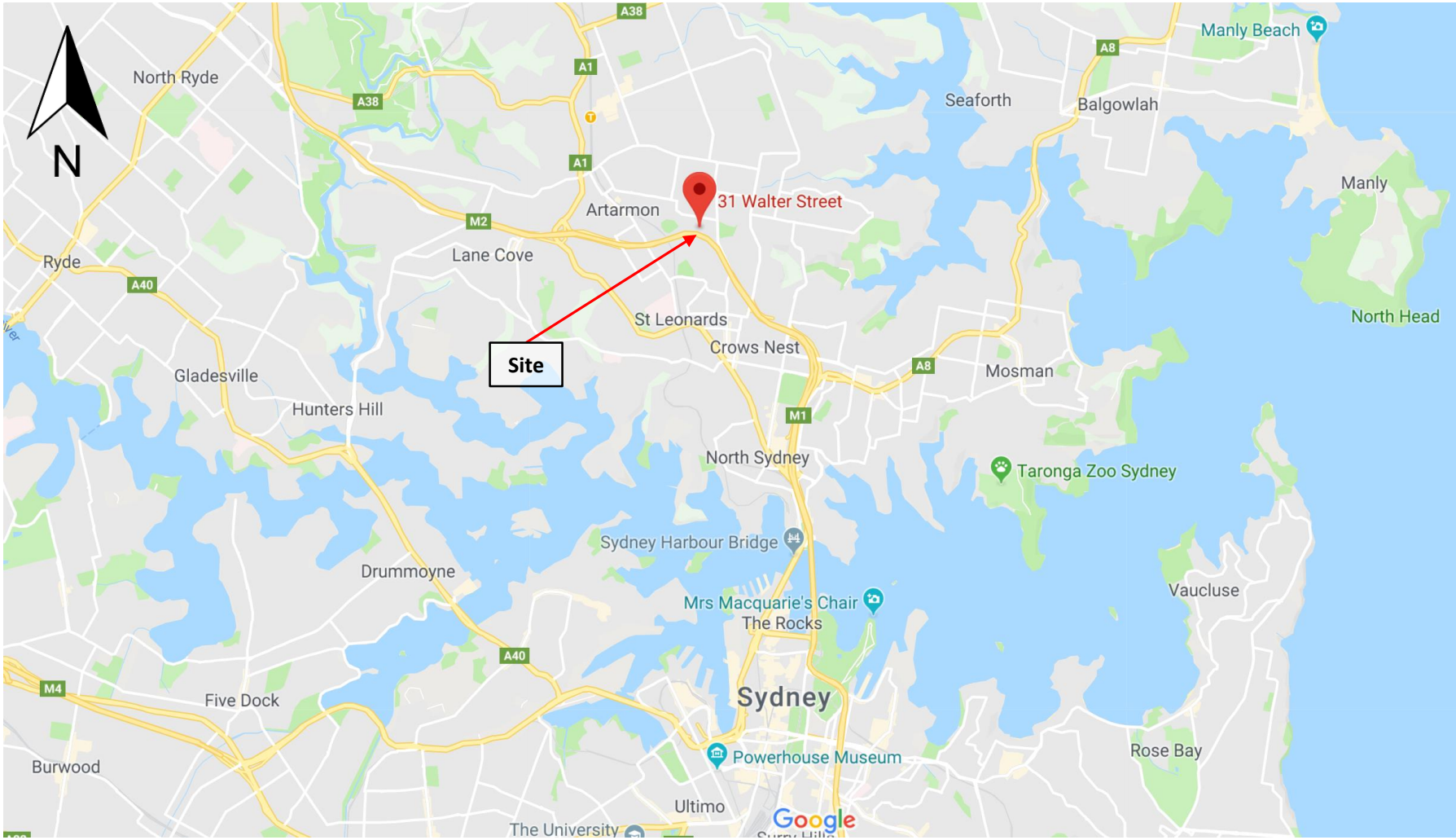
Figures



Source: Map Data 2019 Google

TRACE ENVIRONMENTAL	Project: 19.13	Title:	Site Locality Plan
	Figure: 1	Address:	1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

Hand Auger Locations

Existing Monitoring Well Locations

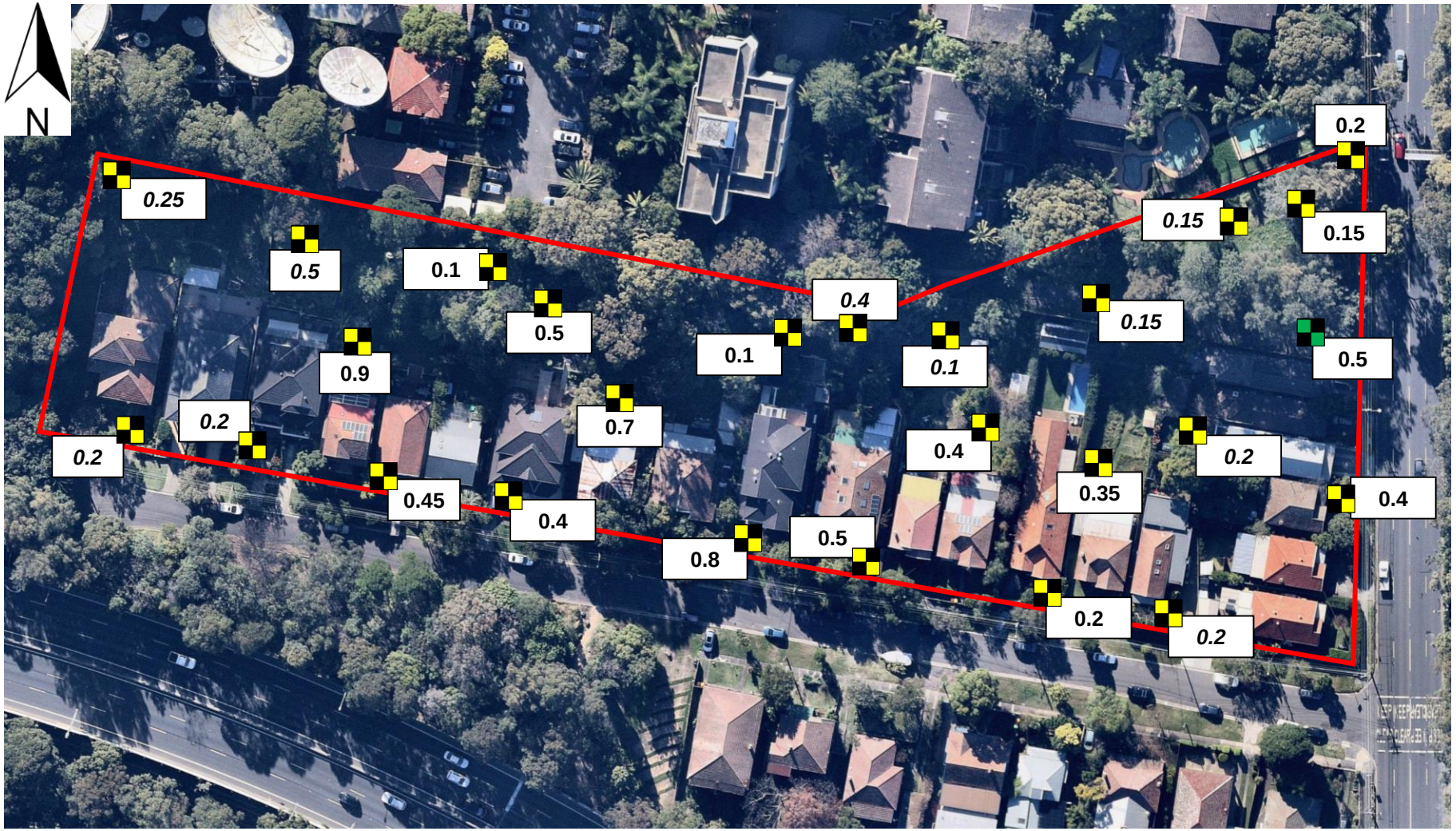
Newly Installed Monitoring Well Location

Approximate Site Boundary

Source: NearMap 1/07/2019

TRACE ENVIRONMENTAL

Project:	**19.13**	Title:	**Site Plan and Sampling locations**
Figure:	**2**	Address:	**1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW**



Hand Auger Locations

Newly Installed Monitoring Well Location

Approximate Site Boundary

Boreholes terminated due to refusal are italicised.

Source: NearMap 1/07/2019

TRACE ENVIRONMENTAL

Project:	**19.13**	Title:	**Encountered Depth of Fill Material**
Figure:	**3**	Address:	**1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW**

Hand Auger Locations

Approximate Site Boundary

Source: NearMap 1/07/2019

TRACE ENVIRONMENTAL	Project: 19.13	Title:	Soil Human Health Criteria Exceedances
	Figure: 4	Address:	1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

Tables

TRACE ENVIRONMENTAL

Table 1: Summary of Soil Analytical Results - Metals, PAH, TPH/TRH, BTEXN, Asbestos and PCBs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

									Sample ID:	SB1/MW4_0.2	QS1	QS1A	SB1/MW4_0.5	SB2_0.1	SB3_0.1	SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5	SB6_0.1	SB7_0.1
									Sample Depth (mBGS):	0.2			0.5	0.1	0.1	0.2	0.1	0.1	0.5	0.1	0.1
									Sample Date:	26/08/2019			26/08/2019	26/08/2019	26/08/2019	26/08/2019	26/08/2019	26/08/2019	26/08/2019	27/08/2019	27/08/2019
Analyte	Units	**HIL B[1]**	**HIL C[2]**	**HIL D[3]**	**HSL Intrusive Maint. Worker - Sand[4]**	**HSL Direct Contact Intrusive Maint Worker[5]**	**HSL Direct Contact Res. (High Density)[6]**	**HSL Direct Contact Recreational/Open Space[7]**	**EIL/ESL[8]**	**LOR**												
Conductivity	uS/cm								**100**	**2**	**2.3**	**2.3**	<5	**3.3**	**2.9**	**3.1**	**3.2**	**2.2**	**5.0**	**3.7**	**2.5**	**5.3**
pH (aqueous extract)	pH	-	-	-	-	-	-	-	-	**0.1**	**7.9**	-	-	-	-	-	-	-	**6.8**	-	**6.8**	-
pH (CaCl2)	pH	-	-	-	-	-	-	-	-	**0.1**	-	-	-	**6.3**	-	-	-	-	-	-	**6.0**	-
Heavy Metals																						
Arsenic	mg/kg	**500**	**300**	**3000**	NE	NE	NE	NE	**100**	**2**	**2.3**	**2.3**	<5	**3.3**	**2.9**	**3.1**	**3.2**	**2.2**	**5.0**	**3.7**	**2.5**	**5.3**
Cadmium	mg/kg	**150**	**90**	**900**	NE	NE	NE	NE	NE	**0.4**	< 0.4	< 0.4	<1	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	**0.5**	< 0.4	< 0.4	< 0.4
Chromium (III+VI)	mg/kg	**500**	**300**	**3600**	NE	NE	NE	NE	**400**	**5**	**10**	**8.8**	**9**	**9.6**	**5.4**	**5.6**	**8.7**	**10**	**9.5**	**15**	**7.7**	**11**
Copper	mg/kg	**30000**	**17000**	**240000**	NE	NE	NE	NE	**140**	**5**	**12**	**14**	**7**	< 5	**11**	**8.7**	**13**	**15**	**17**	**15**	**11**	**13**
Lead	mg/kg	**1200**	**600**	**1500**	NE	NE	NE	NE	**1100**	**5**	**31**	**43**	**21**	**6.1**	**38**	**51**	**46**	**110**	**500**	**14**	**18**	**41**
Mercury	mg/kg	**120**	**80**	**730**	NE	NE	NE	NE	NE	**0.1**	< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	mg/kg	**1200**	**1200**	**6000**	NE	NE	NE	NE	**95**	**5**	< 5	< 5	<2	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Zinc	mg/kg	**60000**	**30000**	**400000**	NE	NE	NE	NE	**310**	**5**	**45**	**80**	**35**	< 5	**90**	**54**	**60**	**91**	**140**	**29**	**31**	**55**
PAHs																						
Acenaphthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a) pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**0.7**	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo[b+j]fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**170**	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs (as B(a)P TPE)	mg/kg	**4**	**3**	**40**	NE	NE	NE	NE	NE	**0.5**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	**400**	**300**	**4000**	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TPH/TRH																						
C6 - C9	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	<50	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	< 50	<100	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C29-C36	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	< 50	<100	< 50	< 50	< 50	< 50	**62**	< 50	< 50	< 50	< 50
C10 - C36 (Sum of total)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	< 50	<50	< 50	< 50	< 50	< 50	**62**	< 50	< 50	< 50	< 50
F1 minus BTEX (C6-C10)	mg/kg	**45, 70, 110, 200[9]**	**NL, NL, NL, NL[10]**	**260, 370, 630, NL[11]**	NE	NE	NE	NE	NE	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2-Napth (C10-C16)	mg/kg	**110, 240, 440, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	NE	NE	NE	NE	NE	**50**	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6-C10	mg/kg	NE	NE	NE	**NL**	**82000**	**5600**	**5100**	**180**	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10-C16	mg/kg	NE	NE	NE	**NL**	**62000**	**4200**	**3800**	**120**	**50**	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16-C34	mg/kg	NE	NE	NE	NE	**85000**	**5800**	**5300**	**300, 1300**	**100**	< 100	< 100	<100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
>C34-C40	mg/kg	NE	NE	NE	NE	**120000**	**8100**	**7400**	**2800, 5600**	**100**	< 100	< 100	<100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEXN																						
Benzene	mg/kg	**0.5, 0.5, 0.5, 0.5[9]**	**NL, NL, NL, NL[10]**	**3, 3, 3, 3[11]**	**77, 160, NL**	**1100**	**140**	**120**	**50, 65**	**0.1**	< 0.1	< 0.1	<0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**160, 220, 310, 540[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**120000**	**21000**	**18000**	**85, 105**	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	**55, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**85000**	**5900**	**5300**	**70, 125**	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene (m & p)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.2**	< 0.2	< 0.2	<0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene (o)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene Total	mg/kg	**40, 60, 95, 170[9]**	**NL, NL, NL, NL[10]**	**230, NL, NL, NL[11]**	**NL**	**130000**	**17000**	**15000**	**105, 45**	**0.3**	< 0.3	< 0.3	<0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	**3, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**29000**	**2200**	**1900**	**170**	**0.5**	< 0.5	< 0.5	<1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos																						
Asbestos	w/w%	**0.04[12]; 0.001[15]**	**0.02[13]; 0.001[15]**	**0.05[14]; 0.001[15]**	NE	NE	NE	NE	NE	**0.001**	ND / NRFD	ND / NRFD	ND	-	**1.0% ACM / NRFD[16]**	ND / NRFD	-	ND / NRFD	ND / NRFD	-	ND / NRFD	ND / NRFD
PCBs																						
Arochlor 1016	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1221	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1232	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1242	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1248	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1254	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
Arochlor 1260	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-
PCBs (Sum of total)	mg/kg	**1**	**1**	**7**	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	-	< 0.1	-	-	< 0.1	< 0.1	-	< 0.1	-

Notes:

1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. CRC CARE 2011 Soil Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 0m to <2m, 2m to <4m, 4m+
5. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Intrusive Maintenance Worker)
6. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Residential B)
7. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
8. NEPM 2013 ESLs (urban residential/public open space coarse/fine)/EILs (urban residential/public open space)
9. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Residential A/B
10. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Recreational Open Space C
11. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Commercial/Industrial D
12. NEPM 2013 Health Screening Levels for Asbestos - Residential B (Residential with minimal opportunities for soil access)
13. NEPM 2013 Health Screening Levels for Asbestos - Recreational C
14. NEPM 2013 Health Screening Levels for Asbestos - Commercial/Industrial D
15. NEPM 2013 Health Screening Level for FA & AF asbestos
16. Chrysotile asbestos detected in fibre cement fragment. Total estimated asbestos content in ACM = 7.5g. Total estimated asbestos concentration in ACM = 1.0% w/w.

NRFD = No respirable fibres detected; ND = No asbestos dected at the reporting limit of 0.001%

QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2

QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1

QS3 and QS3A are duplicate and triplicate of the primary sample SB21_0.05

TRACE ENVIRONMENTAL

Table 1: Summary of Soil Analytical Results - Metals, PAH, TPH/TRH, BTEXN, Asbestos and PCBs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

										Sample ID:	SB7_0.5	SB8_0.1	QS2	QS2A	SB8_0.6	SB9_0.1	SB10_0.1	SB10_0.5	SB11_0.1	SB11_0.6	SB12_0.1	SB12_0.4
										Sample Depth (mBGS):	0.5	0.1			0.6	0.1	0.1	0.5	0.1	0.6	0.1	0.4
										Sample Date:	27/08/2019	27/08/2019			27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019
Analyte	Units	**HIL B[1]**	**HIL C[2]**	**HIL D[3]**	**HSL Intrusive Maint. Worker - Sand[4]**	**HSL Direct Contact Intrusive Maint Worker[5]**	**HSL Direct Contact Res. (High Density)[6]**	**HSL Direct Contact Recreational/Open Space[7]**	**EIL/ESL[8]**	**LOR**													
Conductivity	uS/cm									**10**	-	**34**	-	-	-	**75**	**120**	**110**	-	-	-	-
pH (aqueous extract)	pH	-	-	-	-	-	-	-	-	**0.1**	-	**6.4**	-	-	-	-	**8.4**	-	-	-	-	-
pH (CaCl2)	pH	-	-	-	-	-	-	-	-	**0.1**	-	-	-	-	-	-	-	**5.2**	-	-	-	-
Heavy Metals																							
Arsenic	mg/kg	**500**	**300**	**3000**	NE	NE	NE	NE	**100**	**2**	**7.7**	**18**	**17**	**15**	**11**	**2.5**	**3.8**	**3.8**	**5.3**	**5.5**	**7.4**	**7.1**
Cadmium	mg/kg	**150**	**90**	**900**	NE	NE	NE	NE	NE	**0.4**	< 0.4	< 0.4	**1.6**	**1**	**0.9**	**0.6**	< 0.4	< 0.4	**2.7**	< 0.4	**0.6**	**0.7**
Chromium (III+VI)	mg/kg	**500**	**300**	**3600**	NE	NE	NE	NE	**400**	**5**	**8.3**	**21**	**24**	**22**	**26**	**5.8**	**14**	**19**	**11**	**17**	**15**	**27**
Copper	mg/kg	**30000**	**17000**	**240000**	NE	NE	NE	NE	**140**	**5**	**6.1**	**110**	**86**	**70**	**230**	**21**	**21**	**16**	**28**	< 5	**30**	**47**
Lead	mg/kg	**1200**	**600**	**1500**	NE	NE	NE	NE	**1100**	**5**	**19**	**850**	**330**	**308**	**290**	**85**	**67**	**22**	**160**	**15**	**120**	**210**
Mercury	mg/kg	**120**	**80**	**730**	NE	NE	NE	NE	NE	**0.1**	< 0.1	**0.2**	**0.2**	**0.2**	**0.2**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	mg/kg	**1200**	**1200**	**6000**	NE	NE	NE	NE	**95**	**5**	< 5	**11**	**10**	**9**	**8.7**	< 5	< 5	< 5	**13**	< 5	< 5	< 5
Zinc	mg/kg	**60000**	**30000**	**400000**	NE	NE	NE	NE	**310**	**5**	**35**	**610**	**800**	**583**	**590**	**110**	**81**	**170**	**230**	**8.2**	**260**	**270**
PAHs																							
Acenaphthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a) pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**0.7**	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo[b+j]fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g,h,i)perylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a,h)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**170**	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carcinogenic PAHs (as B(a)P TPE)	mg/kg	**4**	**3**	**40**	NE	NE	NE	NE	NE	**0.5**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg	**400**	**300**	**4000**	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
TPH/TRH																							
C6 - C9	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	<50	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	< 50	< 50	<100	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C29-C36	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	**110**	< 50	< 50	<100	< 50	< 50	< 50	**99**	< 50	**130**	< 50	< 50
C10 - C36 (Sum of total)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	**110**	< 50	< 50	<50	< 50	< 50	< 50	**99**	< 50	**130**	< 50	< 50
F1 minus BTEX (C6-C10)	mg/kg	**45, 70, 110, 200[9]**	**NL, NL, NL, NL[10]**	**260, 370, 630, NL[11]**	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2-Napth (C10-C16)	mg/kg	**110, 240, 440, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	NE	NE	NE	NE	NE	**50**	< 50	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6-C10	mg/kg	NE	NE	NE	**NL**	**82000**	**5600**	**5100**	**180**	**20**	< 20	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10-C16	mg/kg	NE	NE	NE	**NL**	**62000**	**4200**	**3800**	**120**	**50**	< 50	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16-C34	mg/kg	NE	NE	NE	NE	**85000**	**5800**	**5300**	**300, 1300**	**100**	**120**	< 100	< 100	<100	< 100	< 100	< 100	**100**	< 100	**130**	< 100	< 100
>C34-C40	mg/kg	NE	NE	NE	NE	**120000**	**8100**	**7400**	**2800, 5600**	**100**	< 100	< 100	< 100	<100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEXN																							
Benzene	mg/kg	**0.5, 0.5, 0.5, 0.5[9]**	**NL, NL, NL, NL[10]**	**3, 3, 3, 3[11]**	**77, 160, NL**	**1100**	**140**	**120**	**50, 65**	**0.1**	< 0.1	< 0.1	< 0.1	<0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**160, 220, 310, 540[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**120000**	**21000**	**18000**	**85, 105**	**0.1**	< 0.1	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	**55, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**85000**	**5900**	**5300**	**70, 125**	**0.1**	< 0.1	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene (m & p)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.2**	< 0.2	< 0.2	< 0.2	<0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene (o)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene Total	mg/kg	**40, 60, 95, 170[9]**	**NL, NL, NL, NL[10]**	**230, NL, NL, NL[11]**	**NL**	**130000**	**17000**	**15000**	**105, 45**	**0.3**	< 0.3	< 0.3	< 0.3	<0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	**3, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**29000**	**2200**	**1900**	**170**	**0.5**	< 0.5	< 0.5	< 0.5	<1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos																							
Asbestos	w/w%	**0.04[12]; 0.001[15]**	**0.02[13]; 0.001[15]**	**0.05[14]; 0.001[15]**	NE	NE	NE	NE	NE	**0.001**	-	ND / NRFD	-	-	-	ND / NRFD	ND / NRFD	-	ND / NRFD	-	ND / NRFD	-
PCBs																							
Arochlor 1016	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1221	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1232	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1242	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1248	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1254	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
Arochlor 1260	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	< 0.1	-	< 0.1	-	< 0.1	-
PCBs (Sum of total)	mg/kg	**1**	**1**	**7**	NE	NE	NE	NE	NE	**0.1**	-	< 0.1	-	-	-	-	<0.1	-	< 0.1	-	< 0.1	-

Notes:

1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. CRC CARE 2011 Soil Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 0m to <2m, 2m to <4m, 4m+
5. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Intrusive Maintenance Worker)
6. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Residential B)
7. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
8. NEPM 2013 ESLs (urban residential/public open space coarse/fine)/EILs (urban residential/public open space)
9. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Residential A/B
10. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Recreational Open Space C
11. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Commercial/Industrial D
12. NEPM 2013 Health Screening Levels for Asbestos - Residential B (Residential with minimal opportunities for soil access)
13. NEPM 2013 Health Screening Levels for Asbestos - Recreational C
14. NEPM 2013 Health Screening Levels for Asbestos - Commercial/Industrial D
15. NEPM 2013 Health Screening Level for FA & AF asbestos
16. Chrysotile asbestos detected in fibre cement fragment. Total estimated asbestos content in ACM = 7.5g. Total estimated asbestos concentration in ACM = 1.0% w/w.

NRFD = No respirable fibres detected; ND = No asbestos dected at the reporting limit of 0.001%

QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2

QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1

QS3 and QS3A are duplicate and triplicate of the primary sample SB21_0.05

TRACE ENVIRONMENTAL

Table 1: Summary of Soil Analytical Results - Metals, PAH, TPH/TRH, BTEXN, Asbestos and PCBs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

									Sample ID:	SB13_0.1	SB13_0.6	SB14_0.1	SB15_0.1	SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1	SB18_0.1	SB18_0.5	SB19_0.1	SB20_0.1
									Sample Depth (mBGS):	0.1	0.6	0.1	0.1	0.4	0.1	0.3	0.1	0.1	0.5	0.1	0.1
									Sample Date:	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019
Analyte	Units	**HIL B**[1]	**HIL C**[2]	**HIL D**[3]	**HSL Intrusive Maint. Worker - Sand**[4]	**HSL Direct Contact Intrusive Maint Worker**[5]	**HSL Direct Contact Res. (High Density)**[6]	**HSL Direct Contact Recreational/Open Space**[7]	**EIL/ESL**[8]	**LOR**												
Conductivity	uS/cm									**10**	**28**	-	-	**91**	-	**76**	-	**79**	-	-	-	**28**
pH (aqueous extract)	pH	-	-	-	-	-	-	-	-	**0.1**	**6.3**	-	-	**5**	-	-	-	**8.2**	-	-	-	**6.1**
pH (CaCl2)	pH	-	-	-	-	-	-	-	-	**0.1**	-	-	-	-	-	**4.4**	-	-	-	-	-	**5.5**
Heavy Metals																						
Arsenic	mg/kg	**500**	**300**	**3000**	NE	NE	NE	NE	**100**	**2**	**3.3**	< 2	**8.9**	**2.8**	**3.2**	**2.9**	< 2	**5.2**	**4.2**	**2.9**	**5.6**	**6.5**
Cadmium	mg/kg	**150**	**90**	**900**	NE	NE	NE	NE	NE	**0.4**	< 0.4	< 0.4	**0.5**	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	**0.8**	< 0.4	**1.0**	**0.4**
Chromium (III+VI)	mg/kg	**500**	**300**	**3600**	NE	NE	NE	NE	**400**	**5**	**11**	**8.4**	**30**	**9.5**	**16**	**9.7**	**6.6**	**14**	**15**	**11**	**13**	**8.0**
Copper	mg/kg	**30000**	**17000**	**240000**	NE	NE	NE	NE	**140**	**5**	**36**	< 5	**33**	**11**	**5.9**	**28**	< 5	**21**	**120**	**50**	**48**	**28**
Lead	mg/kg	**1200**	**600**	**1500**	NE	NE	NE	NE	**1100**	**5**	**440**	**14**	**69**	**210**	**60**	**150**	**22**	**64**	**200**	**54**	**260**	**54**
Mercury	mg/kg	**120**	**80**	**730**	NE	NE	NE	NE	NE	**0.1**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	**0.1**	**0.1**	< 0.1
Nickel	mg/kg	**1200**	**1200**	**6000**	NE	NE	NE	NE	**95**	**5**	< 5	< 5	**8.0**	< 5	< 5	< 5	< 5	< 5	< 5	**5.1**	< 5	< 5
Zinc	mg/kg	**60000**	**30000**	**400000**	NE	NE	NE	NE	**310**	**5**	**190**	**20**	**180**	**69**	**36**	**120**	**15**	**320**	**160**	**62**	**430**	**160**
PAHs																						
Acenaphthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5
Anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	< 0.5
Benz(a)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.5**	< 0.5	**0.9**	**2.6**	**2.8**	**1.6**	< 0.5
Benzo(a) pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**0.7**	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.7**	< 0.5	**1.4**	**2.5**	**3.3**	**2.4**	< 0.5
Benzo[b+j]fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**1.1**	**2.1**	**2.1**	**1.4**	< 0.5
Benzo(g,h,i)perylene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.9**	**2.0**	**2.2**	**1.5**	< 0.5
Benzo(k)fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**1.3**	**2.3**	**2.2**	**1.6**	< 0.5
Chrysene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5	**1.1**	**2.5**	**2.6**	**1.6**	< 0.5
Dibenz(a,h)anthracene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.5**	**0.5**	< 0.5	< 0.5
Fluoranthene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.9**	< 0.5	**2.3**	**4.4**	**4.8**	**1.5**	< 0.5
Fluorene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**1.3**	**2.1**	**1.9**	**1.6**	< 0.5
Naphthalene	mg/kg	NE	NE	NE	NE	NE	NE	NE	**170**	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.5**	**1.5**	**2.4**	< 0.5	< 0.5
Pyrene	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.8**	< 0.5	**2.3**	**4.1**	**4.9**	**1.8**	< 0.5
Carcinogenic PAHs (as B(a)P TPE)	mg/kg	**4**	**3**	**40**	NE	NE	NE	NE	NE	**0.5**	<0.5	<0.5	<0.5	<0.5	<0.5	**0.8**	<0.5	**1.9**	**4.0**	**4.7**	**3.1**	<0.5
PAHs (Sum of total)	mg/kg	**400**	**300**	**4000**	NE	NE	NE	NE	NE	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**3.5**	< 0.5	**13.1**	**26.6**	**30.9**	**15**	< 0.5
TPH/TRH																						
C6 - C9	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	**230**	< 50	< 50	< 50	**53**	< 50	< 50	**110**	**120**	**110**	< 50
C29-C36	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	**1000**	< 50	**78**	**67**	**120**	< 50	< 50	**75**	**65**	**72**	**62**
C10 - C36 (Sum of total)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**50**	< 50	**1230**	< 50	**78**	**67**	**173**	< 50	< 50	**185**	**185**	**182**	**62**
F1 minus BTEX (C6-C10)	mg/kg	**45, 70, 110, 200**[9]	**NL, NL, NL, NL**[10]	**260, 370, 630, NL**[11]	NE	NE	NE	NE	NE	**20**	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2-Napth (C10-C16)	mg/kg	**110, 240, 440, NL**[9]	**NL, NL, NL, NL**[10]	**NL, NL, NL, NL**[11]	NE	NE	NE	NE	NE	**50**	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6-C10	mg/kg	NE	NE	NE	**NL**	**82000**	**5600**	**5100**	**180**	**20**	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10-C16	mg/kg	NE	NE	NE	**NL**	**62000**	**4200**	**3800**	**120**	**50**	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16-C34	mg/kg	NE	NE	NE	NE	**85000**	**5800**	**5300**	**300, 1300**	**100**	< 100	**970**	< 100	< 100	< 100	**120**	< 100	< 100	**160**	**160**	**160**	< 100
>C34-C40	mg/kg	NE	NE	NE	NE	**120000**	**8100**	**7400**	**2800, 5600**	**100**	< 100	**230**	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEXN																						
Benzene	mg/kg	**0.5, 0.5, 0.5, 0.5**[9]	**NL, NL, NL, NL**[10]	**3, 3, 3, 3**[11]	**77, 160, NL**	**1100**	**140**	**120**	**50, 65**	**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
Toluene	mg/kg	**160, 220, 310, 540**[9]	**NL, NL, NL, NL**[10]	**NL, NL, NL, NL**[11]	**NL**	**120000**	**21000**	**18000**	**85, 105**	**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
Ethylbenzene	mg/kg	**55, NL, NL, NL**[9]	**NL, NL, NL, NL**[10]	**NL, NL, NL, NL**[11]	**NL**	**85000**	**5900**	**5300**	**70, 125**	**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
Xylene (m & p)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.2**	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene (o)	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**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
Xylene Total	mg/kg	**40, 60, 95, 170**[9]	**NL, NL, NL, NL**[10]	**230, NL, NL, NL**[11]	**NL**	**130000**	**17000**	**15000**	**105, 45**	**0.3**	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	**3, NL, NL, NL**[9]	**NL, NL, NL, NL**[10]	**NL, NL, NL, NL**[11]	**NL**	**29000**	**2200**	**1900**	**170**	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos																						
Asbestos	w/w%	**0.04**[12]**; 0.001**[15]	**0.02**[13]**; 0.001**[15]	**0.05**[14]**; 0.001**[15]	NE	NE	NE	NE	NE	**0.001**	ND / NRFD	-	ND / NRFD	ND / NRFD	-	ND / NRFD	-	ND / NRFD	ND / NRFD	-	ND / NRFD	ND / NRFD
PCBs																						
Arochlor 1016	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1221	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1232	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1242	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1248	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1254	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
Arochlor 1260	mg/kg	NE	NE	NE	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1
PCBs (Sum of total)	mg/kg	**1**	**1**	**7**	NE	NE	NE	NE	NE	**0.1**	< 0.1	-	-	< 0.1	-	-	-	< 0.1	-	-	-	< 0.1

Notes:

1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. CRC CARE 2011 Soil Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 0m to <2m, 2m to <4m, 4m+
5. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Intrusive Maintenance Worker)
6. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Residential B)
7. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
8. NEPM 2013 ESLs (urban residential/public open space coarse/fine)/EILs (urban residential/public open space)
9. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Residential A/B
10. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Recreational Open Space C
11. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Commercial/Industrial D
12. NEPM 2013 Health Screening Levels for Asbestos - Residential B (Residential with minimal opportunities for soil access)
13. NEPM 2013 Health Screening Levels for Asbestos - Recreational C
14. NEPM 2013 Health Screening Levels for Asbestos - Commercial/Industrial D
15. NEPM 2013 Health Screening Level for FA & AF asbestos
16. Chrysotile asbestos detected in fibre cement fragment. Total estimated asbestos content in ACM = 7.5g. Total estimated asbestos concentration in ACM = 1.0% w/w.

NRFD = No respirable fibres detected; ND = No asbestos dected at the reporting limit of 0.001%

QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2

QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1

QS3 and QS3A are duplicate and triplicate of the primary sample SB21_0.05

TRACE ENVIRONMENTAL

Table 1: Summary of Soil Analytical Results - Metals, PAH, TPH/TRH, BTEXN, Asbestos and PCBs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

										Sample ID:	SB21_0.05	QS3	QS3A	SB21_0.1	SB22_0.05	SB23_0.1	SB23_0.5	SB24_0.1	SB24_0.5	SB25_0.1	SB26_0.1
										Sample Depth (mBGS):		0.05		0.1	0.05	0.1	0.5	0.1	0.5	0.1	0.1
										Sample Date:		27/08/2019		27/08/2019	27/08/2019	27/08/2019	27/08/2019	28/08/2019	28/08/2019	28/08/2019	28/08/2019
Analyte	Units	**HIL B[1]**	**HIL C[2]**	**HIL D[3]**	**HSL Intrusive Maint. Worker - Sand[4]**	**HSL Direct Contact Intrusive Maint Worker[5]**	**HSL Direct Contact Res. (High Density)[6]**	**HSL Direct Contact Recreational/Open Space[7]**	**EIL/ESL[8]**	**LOR**												
Conductivity	uS/cm									**10**	-	-	-	-	**23**	-	-	-	-	-	-
pH (aqueous extract)	pH	-	-	-	-	-	-	-	-	**0.1**	-	-	-	-	**6.2**	-	-	-	-	-	-
pH (CaCl2)	pH	-	-	-	-	-	-	-	-	**0.1**	-	-	-	-	**5.0**	-	-	-	-	-	-
Heavy Metals																						
Arsenic	mg/kg	**500**	**300**	**3000**	NE	NC	NE	NC	**100**	**2**	**13**	**13**	**10**	**7.4**	**3.5**	**2.0**	**4.8**	**4.0**	< 2	**26**	**3.3**
Cadmium	mg/kg	**150**	**90**	**900**	NE	NC	NE	NC	NE	**0.4**	**1.3**	< 0.4	<1	< 0.4	**0.9**	< 0.4	< 0.4	**1.1**	< 0.4	**6.5**	< 0.4
Chromium (III+VI)	mg/kg	**500**	**300**	**3600**	NE	NC	NE	NC	**400**	**5**	**26**	**58**	**41**	**13**	**18**	**7.8**	**19**	**11**	**6.0**	**28**	**12**
Copper	mg/kg	**30000**	**17000**	**240000**	NE	NC	NE	NC	**140**	**5**	**54**	**65**	**44**	**10.0**	**63**	**10**	**16**	**35**	**12**	**410**	**23**
Lead	mg/kg	**1200**	**600**	**1500**	NE	NC	NE	NC	**1100**	**5**	**110**	**120**	**105**	**20**	**200**	**14**	**35**	**430**	**58**	**430**	**52**
Mercury	mg/kg	**120**	**80**	**730**	NE	NC	NE	NC	NE	**0.1**	< 0.1	< 0.1	**0.2**	< 0.1	< 0.1	< 0.1	< 0.1	**0.1**	< 0.1	**0.2**	**0.3**
Nickel	mg/kg	**1200**	**1200**	**6000**	NE	NC	NE	NC	**95**	**5**	**16**	**15**	**47**	< 5	< 5	< 5	< 5	< 5	< 5	**21**	**6.3**
Zinc	mg/kg	**60000**	**30000**	**400000**	NE	NC	NE	NC	**310**	**5**	**190**	**350**	**209**	< 5	**290**	**35**	**64**	**460**	**68**	**2100**	**91**
PAHs																						
Acenaphthene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.7**	< 0.5
Benzo(a) pyrene	mg/kg	NE	NE	NE	NE	NC	NE	NC	**0.7**	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.7**	< 0.5
Benzo[b+j]fluoranthene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5
Benzo(g,h,i)perylene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.5**	< 0.5
Chrysene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.6**	< 0.5
Dibenz(a,h)anthracene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	**0.7**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.9**	< 0.5
Fluorene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	mg/kg	NE	NE	NE	NE	NC	NE	NC	**170**	**0.5**	< 0.5	< 0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	**0.5**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	**0.7**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**0.9**	< 0.5
Carcinogenic PAHs (as B(a)P TPE)	mg/kg	**4**	**3**	**40**	NE	NC	NE	NC	NE	**0.5**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**0.9**	<0.5
PAHs (Sum of total)	mg/kg	**400**	**300**	**4000**	NE	NC	NE	NC	NE	**0.5**	< 0.5	< 0.5	**1.9**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	**4.9**	< 0.5
TPH/TRH																						
C6 - C9	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**20**	< 20	< 20	<50	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**50**	< 50	< 50	<100	< 50	< 50	< 50	< 50	< 50	< 50	**260**	< 50
C29-C36	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**50**	< 50	< 50	<100	< 50	< 50	**59**	< 50	< 50	< 50	< 50	< 50
C10 - C36 (Sum of total)	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**50**	< 50	< 50	<50	< 50	< 50	**59**	< 50	< 50	< 50	**260**	< 50
F1 minus BTEX (C6-C10)	mg/kg	**45, 70, 110, 200[9]**	**NL, NL, NL, NL[10]**	**260, 370, 630, NL[11]**	NE	NC	NE	NC	NE	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2-Napth (C10-C16)	mg/kg	**110, 240, 440, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	NE	NC	NE	NC	NE	**50**	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6-C10	mg/kg	NE	NE	NE	**NL**	**82000**	**5600**	**5100**	**180**	**20**	< 20	< 20	<10	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10-C16	mg/kg	NE	NE	NE	**NL**	**62000**	**4200**	**3800**	**120**	**50**	< 50	< 50	<50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16-C34	mg/kg	NE	NE	NE	NE	**85000**	**5800**	**5300**	**300, 1300**	**100**	< 100	< 100	<100	< 100	< 100	< 100	< 100	< 100	< 100	**280**	< 100
>C34-C40	mg/kg	NE	NE	NE	NE	**120000**	**8100**	**7400**	**2800, 5600**	**100**	< 100	< 100	<100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
BTEXN																						
Benzene	mg/kg	**0.5, 0.5, 0.5, 0.5[9]**	**NL, NL, NL, NL[10]**	**3, 3, 3, 3[11]**	**77, 160, NL**	**1100**	**140**	**120**	**50, 65**	**0.1**	< 0.1	< 0.1	<0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	mg/kg	**160, 220, 310, 540[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**120000**	**21000**	**18000**	**85, 105**	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	mg/kg	**55, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**85000**	**5900**	**5300**	**70, 125**	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene (m & p)	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.2**	< 0.2	< 0.2	<0.5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene (o)	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	< 0.1	< 0.1	<0.5	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylene Total	mg/kg	**40, 60, 95, 170[9]**	**NL, NL, NL, NL[10]**	**230, NL, NL, NL[11]**	**NL**	**130000**	**17000**	**15000**	**105, 45**	**0.3**	< 0.3	< 0.3	<0.5	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	**3, NL, NL, NL[9]**	**NL, NL, NL, NL[10]**	**NL, NL, NL, NL[11]**	**NL**	**29000**	**2200**	**1900**	**170**	**0.5**	< 0.5	< 0.5	<1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Asbestos																						
Asbestos	w/w%	**0.04[12]; 0.001[15]**	**0.02[13]; 0.001[15]**	**0.05[14]; 0.001[15]**	NE	NC	NE	NC	NE	**0.001**	ND / NRFD	-	-	-	ND / NRFD	ND / NRFD	-	ND / NRFD	-	ND / NRFD	ND / NRFD
PCBs																						
Arochlor 1016	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1221	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1232	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1242	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1248	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1254	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
Arochlor 1260	mg/kg	NE	NE	NE	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-
PCBs (Sum of total)	mg/kg	**1**	**1**	**7**	NE	NC	NE	NC	NE	**0.1**	-	-	-	-	< 0.1	-	-	< 0.1	-	-	-

Notes:

1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. CRC CARE 2011 Soil Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 0m to <2m, 2m to <4m, 4m+
5. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Intrusive Maintenance Worker)
6. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Residential B)
7. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
8. NEPM 2013 ESLs (urban residential/public open space coarse/fine)/EILs (urban residential/public open space)
9. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Residential A/B
10. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Recreational Open Space C
11. NEPM 2013 Soil Health Screening Level for Vapour Intrusion - Commercial/Industrial D
12. NEPM 2013 Health Screening Levels for Asbestos - Residential B (Residential with minimal opportunities for soil access)
13. NEPM 2013 Health Screening Levels for Asbestos - Recreational C
14. NEPM 2013 Health Screening Levels for Asbestos - Commercial/Industrial D
15. NEPM 2013 Health Screening Level for FA & AF asbestos
16. Chrysotile asbestos detected in fibre cement fragment. Total estimated asbestos content in ACM = 7.5g. Total estimated asbestos concentration in ACM = 1.0% w/w.

NRFD = No respirable fibres detected; ND = No asbestos dected at the reporting limit of 0.001%
QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2
QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1
QS3 and QS3A are duplicate and triplicate of the primary sample SB21_0.05

TRACE ENVIRONMENTAL

Table 2: Summary of Soil Analytical Results - Phenols, VOCs, OCPs and OPPs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

						Sample ID:	SB1/MW4_0.2	QS1	QS1A	SB2_0.1	SB4_0.1	SB5_0.1	SB6_0.1	SB8_0.1	QS2	QS2A
						Sample Depth (mBGS):	0.2			0.1	0.1	0.1	0.1	0.1		
						Sample Date:	26/08/2019			26/08/2019	26/08/2019	26/08/2019	27/08/2019	27/08/2019		
Analyte	**Units**	**HIL B[1]**	**HIL C[2]**	**HIL D[3]**	**EIL/ESL[4]**	**LOR**										
Phenols																
2,4,5-trichlorophenol	mg/kg	NE	NE	NE	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
2,4,6-trichlorophenol	mg/kg	NE	NE	NE	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
2,4-dichlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	-
2,4-dimethylphenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	-
2,4-dinitrophenol	mg/kg	NE	NE	NE	NE	5	< 5	< 5	-	-	-	< 5	< 5	< 5	< 5	-
2,6-dichlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	-
2-chlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	< 0.5	-	-	-	< 0.5	< 0.5	< 0.5	< 0.5	-
2-methylphenol	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	-	-	-	< 0.2	< 0.2	< 0.2	< 0.2	-
2-nitrophenol	mg/kg	NE	NE	NE	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
3-&4-methylphenol	mg/kg	**4700**	**4000**	**25000**	NE	0.4	< 0.4	< 0.4	-	-	-	< 0.4	< 0.4	< 0.4	< 0.4	-
4,6-Dinitro-2-methylphenol	mg/kg	NE	NE	NE	NE	5	< 5	< 5	-	-	-	< 5	< 5	< 5	< 5	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	NE	NE	NE	NE	20	< 20	< 20	-	-	-	< 20	< 20	< 20	< 20	-
4-chloro-3-methylphenol	mg/kg	NE	NE	NE	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
4-nitrophenol	mg/kg	NE	NE	NE	NE	5	< 5	< 5	-	-	-	< 5	< 5	< 5	< 5	-
Dinoseb	mg/kg	NE	NE	NE	NE	20	< 20	< 20	-	-	-	< 20	< 20	< 20	< 20	-
Pentachlorophenol	mg/kg	**130**	**120**	**660**	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
Phenol	mg/kg	**45000**	**40000**	**240000**	NE	0.5	< 0.5	< 0.5	<1	-	-	< 0.5	< 0.5	< 0.5	< 0.5	<1
tetrachlorophenols	mg/kg	NE	NE	NE	NE	1	< 10	< 10	-	-	-	< 10	< 10	< 10	< 10	-
Phenols (Total Halogenated)	mg/kg	NE	NE	NE	NE	1	< 1	< 1	-	-	-	< 1	< 1	< 1	< 1	-
Phenols (Total Non Halogenated)	mg/kg	NE	NE	NE	NE	20	< 20	< 20	-	-	-	< 20	< 20	< 20	< 20	-
OCPs																
4,4-DDE	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
a-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Aldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Aldrin + Dieldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
b-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Chlordane	mg/kg	**90**	**70**	**530**	NE	0.1	< 0.1	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-
d-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
DDD	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
DDT	mg/kg	**600**	**400**	**3600**	**180**	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
DDT+DDE+DDD	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Dieldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endosulfan I	mg/kg	**400**	**340**	**2000**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endosulfan II	mg/kg	**400**	**340**	**2000**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endosulfan sulphate	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endrin	mg/kg	**20**	**20**	**100**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endrin aldehyde	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Endrin ketone	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
g-BHC (Lindane)	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Heptachlor	mg/kg	**10**	**10**	**50**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Heptachlor epoxide	mg/kg	NE	NE	NE	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Hexachlorobenzene	mg/kg	**15**	**10**	**80**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Methoxychlor	mg/kg	**500**	**400**	**2500**	NE	0.05	< 0.05	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	-
Toxaphene	mg/kg	**30**	**30**	**160**	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
OPP																
Azinophos methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Bolstar (Sulprofos)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Chlorfenvinphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Chlorpyrifos	mg/kg	**340**	**250**	**2000**	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Chlorpyrifos-methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Coumaphos	mg/kg	NE	NE	NE	NE	2	< 2	-	-	< 2	< 2	< 2	< 2	< 2	-	-
Demeton-O	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Demeton-S	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Diazinon	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Dichlorvos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Dimethoate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Disulfoton	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
EPN	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Ethion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Ethoprop	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Ethyl parathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Fenitrothion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Fensulfothion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Fenthion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Malathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Merphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Methyl parathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Mevinphos (Phosdrin)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Monocrotophos	mg/kg	NE	NE	NE	NE	2	< 2	-	-	< 2	< 2	< 2	< 2	< 2	-	-
Naled (Dibrom)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Omethoate	mg/kg	NE	NE	NE	NE	2	< 2	-	-	< 2	< 2	< 2	< 2	< 2	-	-
Phorate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Pirimiphos-methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Pyrazophos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Ronnel	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Terbufos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Tetrachlorvinphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Tokuthion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
Trichloronate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
VOCs																
VOCs	mg/kg	-	-	-	-	0.5	< 0.5	-	-	-	< 0.5	-	-	-	-	-

Notes:
1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. NEPM 2013 ESLs/EILs (urban residential/public open space coarse/fine)

QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2

QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1

TRACE ENVIRONMENTAL

Table 2: Summary of Soil Analytical Results - Phenols, VOCs, OCPs and OPPs
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

						Sample ID:	SB10_0.1	SB11_0.1	SB12_0.1	SB13_0.1	SB15_0.1	SB17_0.1	SB20_0.1	SB22_0.05	SB23_0.1	SB24_0.1
						Sample Depth (mBGS):	0.1	0.1	0.1	0.1	0.1	0.1	0.1	.05	0.1	0.1
						Sample Date:	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	27/08/2019	28/08/2019
Analyte	**Units**	**HIL B[1]**	**HIL C[2]**	**HIL D[3]**	**EIL/ESL[4]**	**LOR**										
Phenols																
2,4,5-trichlorophenol	mg/kg	NE	NE	NE	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
2,4,6-trichlorophenol	mg/kg	NE	NE	NE	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
2,4-dichlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-
2,4-dimethylphenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-
2,4-dinitrophenol	mg/kg	NE	NE	NE	NE	5	< 5	-	-	< 5	< 5	< 5	< 5	< 5	-	-
2,6-dichlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-
2-chlorophenol	mg/kg	NE	NE	NE	NE	0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-
2-methylphenol	mg/kg	NE	NE	NE	NE	0.2	< 0.2	-	-	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	-
2-nitrophenol	mg/kg	NE	NE	NE	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
3-&4-methylphenol	mg/kg	**4700**	**4000**	**25000**	NE	0.4	< 0.4	-	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	-
4,6-Dinitro-2-methylphenol	mg/kg	NE	NE	NE	NE	5	< 5	-	-	< 5	< 5	< 5	< 5	< 5	-	-
4,6-Dinitro-o-cyclohexyl phenol	mg/kg	NE	NE	NE	NE	20	< 20	-	-	< 20	< 20	< 20	< 20	< 20	-	-
4-chloro-3-methylphenol	mg/kg	NE	NE	NE	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
4-nitrophenol	mg/kg	NE	NE	NE	NE	5	< 5	-	-	< 5	< 5	< 5	< 5	< 5	-	-
Dinoseb	mg/kg	NE	NE	NE	NE	20	< 20	-	-	< 20	< 20	< 20	< 20	< 20	-	-
Pentachlorophenol	mg/kg	**130**	**120**	**660**	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
Phenol	mg/kg	**45000**	**40000**	**240000**	NE	0.5	< 0.5	-	-	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	-	-
tetrachlorophenols	mg/kg	NE	NE	NE	NE	1	< 10	-	-	< 10	< 10	< 10	< 10	< 10	-	-
Phenols (Total Halogenated)	mg/kg	NE	NE	NE	NE	1	< 1	-	-	< 1	< 1	< 1	< 1	< 1	-	-
Phenols (Total Non Halogenated)	mg/kg	NE	NE	NE	NE	20	< 20	-	-	< 20	< 20	< 20	< 20	< 20	-	-
OCPs																
4,4-DDE	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
a-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Aldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Aldrin + Dieldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	**0.06**
b-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Chlordane	mg/kg	**90**	**70**	**530**	NE	0.1	**0.3**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
d-BHC	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
DDD	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
DDT	mg/kg	**600**	**400**	**3600**	**180**	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
DDT+DDE+DDD	mg/kg	**600**	**400**	**3600**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Dieldrin	mg/kg	**10**	**10**	**45**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	**0.06**
Endosulfan I	mg/kg	**400**	**340**	**2000**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Endosulfan II	mg/kg	**400**	**340**	**2000**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Endrin	mg/kg	**20**	**20**	**100**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Endrin ketone	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	mg/kg	NE	NE	NE	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Heptachlor	mg/kg	**10**	**10**	**50**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	mg/kg	NE	NE	NE	NE	0.05	**0.06**	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	mg/kg	**15**	**10**	**80**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Methoxychlor	mg/kg	**500**	**400**	**2500**	NE	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	-	< 0.05
Toxaphene	mg/kg	**30**	**30**	**160**	NE	1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	-	< 1
OPP																
Azinophos methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Bolstar (Sulprofos)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	mg/kg	**340**	**250**	**2000**	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Coumaphos	mg/kg	NE	NE	NE	NE	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	< 2
Demeton-O	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Demeton-S	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Diazinon	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Dichlorvos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Dimethoate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Disulfoton	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
EPN	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Ethion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Ethoprop	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Fenitrothion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Fensulfothion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Fenthion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Malathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Merphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Methyl parathion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Mevinphos (Phosdrin)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Monocrotophos	mg/kg	NE	NE	NE	NE	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	< 2
Naled (Dibrom)	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Omethoate	mg/kg	NE	NE	NE	NE	2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	-	< 2
Phorate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Pyrazophos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Ronnel	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Terbufos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Tokuthion	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Trichloronate	mg/kg	NE	NE	NE	NE	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
VOCs																
VOCs	mg/kg	-	-	-	-	0.5	-	-	-	-	-	< 0.5	-	< 0.5	< 0.5	-

Notes:
1. NEPM 2013 Health investigation levels for soil contaminants - Residential B
2. NEPM 2013 Health investigation levels for soil contaminants - Open Space C
3. NEPM 2013 Health investigation levels for soil contaminants - Commercial/Industrial D
4. NEPM 2013 ESLs/EILs (urban residential/public open space coarse/fine)

QS1 and QS1A are duplicate and triplicate of the primary sample SB1/MW4_0.2

QS2 and QS2A are duplicate and triplicate of the primary sample SB8_0.1

TRACE ENVIRONMENTAL

TABLE 3: SUMMARY OF SOIL ANALYTICAL RESULTS - QUALITY ASSURANCE QUALITY CONTROL
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

	Sample ID	SB1/MW4_0.2	QS1	RPD	QS1A	RPD	SB8_0.1	QS2	RPD	QS2A	RPD	SB21_0.05	QS3	RPD	QS3A	RPD
	Sample Date	26/08/2019			26/08/2019		27/08/2019			27/08/2019		27/08/2019			27/08/2019	
	LOR															
TPH/TRH/BTEXN																
C6 - C9	20	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%
C10 - C14	20	< 20	< 20	0%	<50	0%	< 20	< 20	0%	<50	0%	< 20	< 20	0%	<50	0%
C15 - C28	50	< 50	< 50	0%	<100	0%	< 50	< 50	0%	<100	0%	< 50	< 50	0%	<100	0%
C29-C36	50	< 50	< 50	0%	<100	0%	< 50	< 50	0%	<100	0%	< 50	< 50	0%	<100	0%
C10 - C36 (Sum of total)	50	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%
F1 minus BTEX (C6-C10)	20	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%
F2-Napth (C10-C16)	50	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%
C6-C10	20	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%	< 20	< 20	0%	<10	0%
>C10-C16	50	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%	< 50	< 50	0%	<50	0%
>C16-C34	100	< 100	< 100	0%	<100	0%	< 100	< 100	0%	<100	0%	< 100	< 100	0%	<100	0%
>C34-C40	100	< 100	< 100	0%	<100	0%	< 100	< 100	0%	<100	0%	< 100	< 100	0%	<100	0%
Benzene	0.1	< 0.1	< 0.1	0%	<0.2	0%	< 0.1	< 0.1	0%	<0.2	0%	< 0.1	< 0.1	0%	<0.2	0%
Toluene	0.1	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%
Ethylbenzene	0.1	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%
Xylene (m & p)	0.2	< 0.2	< 0.2	0%	<0.5	0%	< 0.2	< 0.2	0%	<0.5	0%	< 0.2	< 0.2	0%	<0.5	0%
Xylene (o)	0.1	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%	< 0.1	< 0.1	0%	<0.5	0%
Xylene Total	0.3	< 0.3	< 0.3	0%	<0.5	0%	< 0.3	< 0.3	0%	<0.5	0%	< 0.3	< 0.3	0%	<0.5	0%
Naphthalene	0.5	< 0.5	< 0.5	0%	<1	0%	< 0.5	< 0.5	0%	<1	0%	< 0.5	< 0.5	0%	<1	0%
PAH																
Acenaphthene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Acenaphthylene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Anthracene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Benz(a)anthracene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Benzo(a) pyrene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Benzo[b+j]fluoranthene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Benzo(g,h,i)perylene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Benzo(k)fluoranthene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Chrysene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Dibenz(a,h)anthracene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Fluoranthene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	**0.70**	94%
Fluorene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Indeno(1,2,3-c,d)pyrene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Naphthalene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%
Phenanthrene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	**0.50**	67%
Pyrene	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	**0.70**	94%
Carcinogenic PAHs (as B(a)P TPE)	0.5	-	-	0%	-	0%	-	-	0%	-	0%	-	-	0%	-	0%
PAHs (Sum of total)	0.5	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	<0.5	0%	< 0.5	< 0.5	0%	**1.90**	154%
Metals																
Arsenic	2	**2.3**	**2.3**	0%	<5	8%	**18**	**17**	6%	**15**	18%	**13**	**13**	0%	**10**	26%
Cadmium	0.4	< 0.4	< 0.4	0%	<1	0%	< 0.4	**1.6**	155%	**1**	133%	**1.3**	< 0.4	146%	<1	88%
Chromium (Total)	5	**10**	**8.8**	13%	**9**	11%	**21**	**24**	13%	**22**	5%	**26**	**58**	76%	**41**	45%
Copper	5	**12**	**14**	15%	**7**	53%	**110**	**86**	24%	**70**	44%	**54**	**65**	18%	**44**	20%
Lead	5	**31**	**43**	32%	**21**	38%	**850**	**330**	88%	**308**	94%	**110**	**120**	9%	**105**	5%
Mercury	0.1	< 0.1	< 0.1	0%	<0.1	0%	**0.2**	**0.2**	0%	**0.2**	0%	< 0.1	< 0.1	0%	**0.2**	120%
Nickel	5	< 5	< 5	0%	<2	0%	**11**	**10**	10%	**9**	20%	**16**	**15**	6%	**47**	98%
Zinc	5	**45**	**80**	56%	**35**	25%	**610**	**800**	27%	**583**	5%	**190**	**350**	59%	**209**	10%
Asbestos																
Asbestos	0.001	**ND**	**ND**	0%	**ND**	0%	-	-	-	-	-	-	-	-	-	-
Phenols																
2,4,5-trichlorophenol	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
2,4,6-trichlorophenol	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
2,4-dichlorophenol	0.5	< 0.5	< 0.5	0%	-	-	< 0.5	< 0.5	0%	-	-	-	-	-	-	-
2,4-dimethylphenol	0.5	< 0.5	< 0.5	0%	-	-	< 0.5	< 0.5	0%	-	-	-	-	-	-	-
2,4-dinitrophenol	5	< 5	< 5	0%	-	-	< 5	< 5	0%	-	-	-	-	-	-	-
2,6-dichlorophenol	0.5	< 0.5	< 0.5	0%	-	-	< 0.5	< 0.5	0%	-	-	-	-	-	-	-
2-chlorophenol	0.5	< 0.5	< 0.5	0%	-	-	< 0.5	< 0.5	0%	-	-	-	-	-	-	-
2-methylphenol	0.2	< 0.2	< 0.2	0%	-	-	< 0.2	< 0.2	0%	-	-	-	-	-	-	-
2-nitrophenol	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
3-&4-methylphenol	0.4	< 0.4	< 0.4	0%	-	-	< 0.4	< 0.4	0%	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	5	< 5	< 5	0%	-	-	< 5	< 5	0%	-	-	-	-	-	-	-
4,6-Dinitro-o-cyclohexyl phenol	20	< 20	< 20	0%	-	-	< 20	< 20	0%	-	-	-	-	-	-	-
4-chloro-3-methylphenol	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
4-nitrophenol	5	< 5	< 5	0%	-	-	< 5	< 5	0%	-	-	-	-	-	-	-
Dinoseb	20	< 20	< 20	0%	-	-	< 20	< 20	0%	-	-	-	-	-	-	-
Pentachlorophenol	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
Phenol	0.5	< 0.5	< 0.5	0%	<1	0%	< 0.5	< 0.5	0%	<1	0%	-	-	-	-	-
tetrachlorophenols	1	< 10	< 10	0%	-	-	< 10	< 10	0%	-	-	-	-	-	-	-
Phenols (Total Halogenated)	1	< 1	< 1	0%	-	-	< 1	< 1	0%	-	-	-	-	-	-	-
Phenols (Total Non Halogenated)	20	< 20	< 20	0%	-	-	< 20	< 20	0%	-	-	-	-	-	-	-

Notes:
All units in mg/kg
High RPDs are shaded
Acceptable RPDs for each LOR multiplier range are: No Limit (<10 x LOR); <30% RPD (Inorganic); and <50% RPD (Organic).

TABLE 4: SUMMARY OF SOIL TRIP BLANK AND TRIP SPIKE RESULTS
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

	Sample ID:	TB1	TS1
	Sample Date:	28/08/2019	28/08/2019
TPH/TRH/BTEX	**LOR (mg/kg)**		
Benzene	0.1	< 0.1	110
Toluene	0.1	< 0.1	110
Ethylbenzene	0.1	< 0.1	130
meta- & para-Xylene	0.2	< 0.2	110
ortho-Xylene	0.1	< 0.1	110
Total Xylenes	0.3	< 0.3	110
Naphthalene	0.5	< 0.5	98
TRH C6-C9	20	<20	110
TRH C6-C10	20	<20	110

Notes:

LOR - Limits of Reporting

Recoveries (%) are shown for Trip Spike samples

TABLE 5: SUMMARY OF SOIL RINSATE ANALYTICAL DATA
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

	Sample ID:	RB-1	RB-2	RB-3
	Sample Date:	26/08/2019	27/08/2019	28/08/2019
BTEXN	**LOR (mg/L)**			
Benzene	0.1	< 0.001	< 0.001	< 0.001
Toluene	0.1	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.1	< 0.001	< 0.001	< 0.001
Xylene (m & p)	0.2	< 0.002	< 0.002	< 0.002
Xylene (o)	0.1	< 0.001	< 0.001	< 0.001
Xylene Total	0.3	< 0.003	< 0.003	< 0.003
Naphthalene	0.5	< 0.01	< 0.01	< 0.01
Heavy Metals				
Arsenic	2	< 0.001	< 0.001	< 0.001
Cadmium	0.4	< 0.0002	< 0.0002	< 0.0002
Chromium (III+VI)	5	< 0.001	< 0.001	< 0.001
Copper	5	< 0.001	< 0.001	< 0.001
Lead	5	< 0.001	< 0.001	< 0.001
Mercury	0.1	< 0.0001	< 0.0001	< 0.0001
Nickel	5	< 0.001	< 0.001	< 0.001
Zinc	5	< 0.005	< 0.005	< 0.005
PAHs				
Acenaphthene	0.5	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.5	< 0.001	< 0.001	< 0.001
Anthracene	0.5	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.5	< 0.001	< 0.001	< 0.001
Benzo(a) pyrene	0.5	< 0.001	< 0.001	< 0.001
Benzo[b+j]fluoranthene	0.5	< 0.001	< 0.001	< 0.001
Benzo(g,h,i)perylene	0.5	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.5	< 0.001	< 0.001	< 0.001
Chrysene	0.5	< 0.001	< 0.001	< 0.001
Dibenz(a,h)anthracene	0.5	< 0.001	< 0.001	< 0.001
Fluoranthene	0.5	< 0.001	< 0.001	< 0.001
Fluorene	0.5	< 0.001	< 0.001	< 0.001
Indeno(1,2,3-c,d)pyrene	0.5	< 0.001	< 0.001	< 0.001
Naphthalene	0.5	< 0.001	< 0.001	< 0.001
Phenanthrene	0.5	< 0.001	< 0.001	< 0.001
Pyrene	0.5	< 0.001	< 0.001	< 0.001
PAHs (Sum of total)	0.5	< 0.001	< 0.001	< 0.001
TPH/TRH				
C6 - C9	20	< 0.02	< 0.02	< 0.02
C10 - C14	20	< 0.05	< 0.05	< 0.05
C15 - C28	50	< 0.1	< 0.1	< 0.1
C29-C36	50	< 0.1	< 0.1	< 0.1
C10 - C36 (Sum of total)	50	< 0.1	< 0.1	< 0.1
F1 minus BTEX (C6-C10)	20	< 0.02	< 0.02	< 0.02
F2-Napth (C10-C16)	50	< 0.05	< 0.05	< 0.05
C6-C10	20	< 0.02	< 0.02	< 0.02
>C10-C16	50	< 0.05	< 0.05	< 0.05
>C16-C34	100	< 0.1	< 0.1	< 0.1
>C34-C40	100	< 0.1	< 0.1	< 0.1
Phenols (Halogenated)				
2.4.5-Trichlorophenol	0.01	< 0.01	< 0.01	< 0.01
2.4.6-Trichlorophenol	0.01	< 0.01	< 0.01	< 0.01
2.4-Dichlorophenol	0.003	< 0.003	< 0.003	< 0.003
2.6-Dichlorophenol	0.003	< 0.003	< 0.003	< 0.003
2-Chlorophenol	0.003	< 0.003	< 0.003	< 0.003
4-Chloro-3-methylphenol	0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol	0.01	< 0.01	< 0.01	< 0.01
Tetrachlorophenols - Total	0.03	< 0.03	< 0.03	< 0.03
Phenols (non-Halogenated)				
2.4-Dimethylphenol	0.003	< 0.003	< 0.003	< 0.003
2.4-Dinitrophenol	0.03	< 0.03	< 0.03	< 0.03
2-Cyclohexyl-4.6-dinitrophenol	0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	< 0.03	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	< 0.003	< 0.003	< 0.003
2-Nitrophenol	0.01	< 0.01	< 0.01	< 0.01
3&4-Methylphenol (m&p-Cresol)	0.006	< 0.006	< 0.006	< 0.006
4-Nitrophenol	0.03	< 0.03	< 0.03	< 0.03
Dinoseb	0.1	< 0.1	< 0.1	< 0.1
Phenol	0.003	< 0.003	< 0.003	< 0.003
Total Halogenated Phenol*	0.01	< 0.01	< 0.01	< 0.01
Total Non-Halogenated Phenol*	0.1	< 0.1	< 0.1	< 0.1

Notes:

LOR - Limits of Reporting

TRACE ENVIRONMENTAL

TABLE 6: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

						Sample ID:	MW1	QW1	QW1A	MW2	MW3	MW4
						Sample Date:	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019
Compounds	**LOR**	**NEPM 2013 Drinking Water GIL[1]**	**NEPM 2013 Freshwater GIL[2]**	**HSL A/B[3]**	**HSL C[4]**	**HSL Intrusive Maint. Worker Sand [5]**						
BTEXN												
Benzene	0.001	**0.001**	**0.95**	**0.8, 0.8, 0.9**	**NL**	**NL**	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	**0.8**	NE	**NL**	**NL**	**NL**	< 0.001	< 0.001	<0.002	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	**0.3**	NE	**NL**	**NL**	**NL**	< 0.001	< 0.001	<0.002	< 0.001	< 0.001	< 0.001
meta- & para-Xylene	0.002	NE	**0.2**	NE	NE	NE	< 0.002	< 0.002	<0.002	< 0.002	< 0.002	< 0.002
ortho-Xylene	0.001	NE	**0.35**	NE	NE	NE	< 0.001	< 0.001	<0.002	< 0.001	< 0.001	< 0.001
Total Xylenes	0.003	**0.6**	NE	**NL**	**NL**	**NL**	< 0.003	< 0.003	<0.002	< 0.003	< 0.003	< 0.003
Naphthalene	0.01	NE	**0.16**	**NL**	**NL**	**NL**	< 0.01	< 0.01	<0.005	< 0.01	< 0.01	< 0.01
Total Petroleum Hydrocarbons/Total Recoverable Hydrocarbons												
C6 - C9 Fraction	0.02	NE	NE	NE	NE	NE	< 0.02	< 0.02	<0.02	< 0.02	< 0.02	< 0.02
C10 - C14 Fraction	0.05	NE	NE	NE	NE	NE	< 0.05	< 0.05	<0.05	< 0.05	< 0.05	< 0.05
C15 - C28 Fraction	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1
C29 - C36 Fraction	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	<0.05	< 0.1	< 0.1	< 0.1
C10 - C36 Fraction (sum)	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	<0.05	< 0.1	< 0.1	< 0.1
TRH Fraction F1	0.02	NE	NE	**1, 1, 1**	**NL**	**NL**	< 0.02	< 0.02	<0.02	< 0.02	< 0.02	< 0.02
C6 - C10 Fraction	0.02	NE	NE	NE	NE	NE	< 0.02	< 0.02	<0.02	< 0.02	< 0.02	< 0.02
>C10 - C16 Fraction	0.05	NE	NE	NE	NE	NE	< 0.05	< 0.05	<0.1	< 0.05	< 0.05	< 0.05
>C16 - C34 Fraction	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1
>C34 - C40 Fraction	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	<0.1	< 0.1	< 0.1	< 0.1
TRH Fraction F2	0.05	NE	NE	**1, 1, 1**	**NL**	**NL**	< 0.05	< 0.05	<0.1	< 0.05	< 0.05	< 0.05
Metals												
Arsenic	0.001	**0.01**	**0.024**	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	**0.004**
Cadmium	0.0002	**0.002**	**0.0002**	NE	NE	NE	< 0.0002	< 0.0002	<0.0001	< 0.0002	**0.0003**	**0.0048**
Chromium	0.001	**0.05**	**0.001**	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Copper	0.001	**2**	**0.0014**	NE	NE	NE	**0.002**	**0.018**	<0.001	**0.033**	**0.026**	**0.017**
Lead	0.001	**0.01**	**0.0034**	NE	NE	NE	< 0.001	**0.001**	<0.001	**0.007**	**0.002**	**0.019**
Mercury	0.0001	**0.001**	**0.00006**	NE	NE	NE	< 0.0001	< 0.0001	<0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	**0.02**	**0.011**	NE	NE	NE	**0.003**	**0.014**	**0.002**	**0.014**	**0.037**	**0.072**
Zinc	0.005	NE	**0.008**	NE	NE	NE	**0.011**	**0.070**	**0.006**	**0.10**	**0.19**	**0.70**
Polycyclic Aromatic Hydrocarbons												
Acenaphthene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	**0.00001**	NE	NE	NE	NE	< 0.001	< 0.001	<0.005	< 0.001	< 0.001	< 0.001
Benzo(b+j)fluoranthene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3.cd)pyrene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	NE	**0.016**	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Sum of PAHs	0.001	NE	NE	NE	NE	NE	< 0.001	< 0.001	<0.005	< 0.001	< 0.001	< 0.001
Organochlorine Pesticides												
4.4'-DDD	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	**0.009**	**0.000006**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Aldrin and Dieldrin (Total)	0.0001	**0.0003**	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Chlordanes - Total	0.001	**0.002**	**0.00003**	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
d-BHC	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	**0.02**	**0.00003**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	**0.02**	**0.00003**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	NE	**0.00001**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Endrin ketone	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	**0.01**	**0.0002**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	NE	**0.00001**	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	**0.0003**	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	NE	NE	NE	NE	NE	< 0.0001	-	-	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	NE	**0.0001**	NE	NE	NE	< 0.01	-	-	< 0.01	< 0.01	< 0.01
Organophosphorous Pesticides												
Azinphos-methyl	0.002	**0.03**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Bolstar	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	0.002	**0.002**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Chlorpyrifos	0.02	**0.01**	**0.00001**	NE	NE	NE	< 0.02	-	-	< 0.02	< 0.02	< 0.02
Chlorpyrifos-methyl	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Coumaphos	0.02	NE	NE	NE	NE	NE	< 0.02	-	-	< 0.02	< 0.02	< 0.02
Demeton-O	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Demeton-S	0.02	NE	NE	NE	NE	NE	< 0.02	-	-	< 0.02	< 0.02	< 0.02
Diazinon	0.002	**0.004**	**0.00001**	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Dichlorvos	0.002	**0.005**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Dimethoate	0.002	**0.007**	**0.00015**	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Disulfoton	0.002	**0.004**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
EPN	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Ethion	0.002	**0.004**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Ethoprop	0.002	**0.001**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Ethyl parathion	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Fenitrothion	0.002	**0.007**	**0.0002**	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Fensulfothion	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Fenthion	0.002	**0.007**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Malathion	0.002	**0.07**	**0.00005**	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Merphos	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Methyl parathion	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Mevinphos	0.002	**0.006**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Monocrotophos	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Naled	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Omethoate	0.002	**0.001**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Phorate	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	0.02	**0.09**	NE	NE	NE	NE	< 0.02	-	-	< 0.02	< 0.02	< 0.02
Pyrazophos	0.002	**0.02**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Ronnel	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Terbufos	0.002	**0.0009**	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Tokuthion	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Trichloronate	0.002	NE	NE	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002

Notes:
All units in mg/L unless otherwise noted
NE - Not Established; NL - Not Limiting
1. NEPM 2013 Groundwater Investigation Level for Drinking Water
2. NEPM 2013 Groundwater Investigation Level for protection of freshwater at 95% confidence for typical slightly to moderately disturbed systems.
3. NEPM 2013 Groundwater HSL for low-high density residential land use - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
4. NEPM 2013 Groundwater HSL for recreational/open space land use - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
5. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
QW-1 and QW-1A are the duplicate and triplicate of the primary sample MW1

TRACE ENVIRONMENTAL

TABLE 6: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

						Sample ID:	MW1	QW1	QW1A	MW2	MW3	MW4
						Sample Date:	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019	2/09/2019
Compounds	**LOR**	**NEPM 2013 Drinking Water GIL[1]**	**NEPM 2013 Freshwater GIL[2]**	**HSL A/B[3]**	**HSL C[4]**	**HSL Intrusive Maint. Worker Sand [5]**						
Phenols												
2.4.5-Trichlorophenol	0.001	NE	NE	NE	NE	NE	< 0.01	< 0.01	<0.001	< 0.01	< 0.01	< 0.01
2.4.6-Trichlorophenol	0.01	**0.02**	**0.003**	NE	NE	NE	< 0.01	< 0.01	<0.001	< 0.01	< 0.01	< 0.01
2.4-Dichlorophenol	0.003	**0.2**	**0.12**	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
2.4-Dimethylphenol	0.003	NE	NE	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
2.4-Dinitrophenol	0.03	NE	**0.045**	NE	NE	NE	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03
2.6-Dichlorophenol	0.003	NE	NE	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
2-Chlorophenol	0.003	**0.3**	**0.34**	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
2-Cyclohexyl-4.6-dinitrophenol	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	NE	NE	NE	NE	NE	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	NE	NE	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
2-Nitrophenol	0.01	NE	NE	NE	NE	NE	< 0.01	< 0.01	<0.001	< 0.01	< 0.01	< 0.01
3&4-Methylphenol (m&p-Cresol)	0.006	NE	NE	NE	NE	NE	< 0.006	< 0.006	<0.002	< 0.006	< 0.006	< 0.006
4-Chloro-3-methylphenol	0.01	NE	NE	NE	NE	NE	< 0.01	< 0.01	<0.001	< 0.01	< 0.01	< 0.01
4-Nitrophenol	0.03	NE	NE	NE	NE	NE	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03
Dinoseb	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1
Pentachlorophenol	0.01	**0.01**	**0.0036**	NE	NE	NE	< 0.01	< 0.01	<0.002	< 0.01	< 0.01	< 0.01
Phenol	0.003	NE	NE	NE	NE	NE	< 0.003	< 0.003	<0.001	< 0.003	< 0.003	< 0.003
Tetrachlorophenols - Total	0.03	NE	NE	NE	NE	NE	< 0.03	< 0.03	-	< 0.03	< 0.03	< 0.03
Total Halogenated Phenol	0.01	NE	NE	NE	NE	NE	< 0.01	< 0.01	-	< 0.01	< 0.01	< 0.01
Total Non-Halogenated Phenol	0.1	NE	NE	NE	NE	NE	< 0.1	< 0.1	-	< 0.1	< 0.1	< 0.1
Polychlorinated Biphenyls												
Aroclor-1016	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1221	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1232	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1242	0.001	NE	**0.0003**	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1248	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1254	0.001	NE	**0.00001**	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Aroclor-1260	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Total PCB	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Volatile Organic Compounds												
1.1.1.2-Tetrachloroethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	NE	**0.0065**	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.1-Dichloroethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	**0.03**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	**0.003**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	NE	NE	NE	NE	NE	**0.001**	-	-	< 0.005	< 0.001	< 0.005
4-Chlorotoluene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Benzene	0.001	**0.001**	**0.95**	**0.8, 0.8, 0.9**	**NL**	**NL**	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Bromoform	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	**0.003**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Chloroform	0.005	NE	NE	NE	NE	NE	< 0.005	-	-	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	**0.3**	NE	**NL**	**NL**	**NL**	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	NE	**0.2**	NE	NE	NE	< 0.002	-	-	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	NE	**0.35**	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Styrene	0.001	**0.03**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	**0.05**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Toluene	0.001	**0.8**	NE	**NL**	**NL**	**NL**	< 0.001	-	-	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	NE	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	**0.0003**	NE	NE	NE	NE	< 0.001	-	-	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	**0.6**	NE	**NL**	**NL**	**NL**	<0.003	-	-	< 0.003	< 0.003	< 0.003

Notes:
All units in mg/L unless otherwise noted
NE - Not Established; NL - Not Limiting
1. NEPM 2013 Groundwater Investigation Level for Drinking Water
2. NEPM 2013 Groundwater Investigation Level for protection of freshwater at 95% confidence for typical slightly to moderately disturbed systems.
3. NEPM 2013 Groundwater HSL for low-high density residential land use - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
4. NEPM 2013 Groundwater HSL for recreational/open space land use - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
5. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker in a Shallow Trench - 2m to <4m, 4m to <8m, 8m+ (Sand). Criteria provided for sand as a conservative approach.
QW-1 and QW-1A are the duplicate and triplicate of the primary sample MW1

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TABLE 7: SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
- PFAS
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

			Sample ID:	**MW1**	**MW2**	**MW3**	**MW4**
			Sample Date:	**2/09/2019**	**2/09/2019**	**2/09/2019**	**2/09/2019**
Compounds	**LOR**	**PFAS NEMP 2018 Drinking Water[1]**	**PFAS NEMP 2018 Freshwater + Marine Water (Interim)[2]**				
Perfluoroalkyl Carboxylic Acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
Perfluorodecanoic acid (PFDA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)	0.01	NE	NE	< 0.01	< 0.01	**0.01**	< 0.01
Perfluorononanoic acid (PFNA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)	0.01	**0.56**	**220**	**0.01**	< 0.01	< 0.01	< 0.01
Perfluoropentanoic acid (PFPeA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroalkyl Sulfonamido Substances							
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
Perfluorooctane sulfonamide (FOSA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoroalkyl Sulfonic Acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)	0.01	NE	NE	< 0.01	**0.01**	**0.01**	< 0.01
Perfluorooctanesulfonic acid (PFOS)	0.01	NE	**0.13**	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
n:2 Fluorotelomer Sulfonic Acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	0.01	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05
PFASs Summations							
Sum (PFHxS + PFOS)	0.01	**0.07**	NE	< 0.01	**0.01**	**0.01**	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.01	NE	NE	**0.01**	**0.01**	**0.01**	< 0.01
Sum of PFASs (n=30)	0.01	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1
Sum of US EPA PFAS (PFOS + PFOA)	0.01	NE	NE	**0.01**	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)	0.05	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05

Notes:
All units in ug/L unless otherwise noted
1. NEMP 2018 health-based guidance values
2. NEMP 2018 guideline values for 95% species protection - slightly to moderately disturbed systems
QW-1 and QW-1A are the duplicate and triplicate of the primary sample MW1

TRACE ENVIRONMENTAL

TABLE 8: SUMMARY OF GROUNDWATER ANALYTICAL DATA
- QUALITY ASSURANCE QUALITY CONTROL
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

			Sample ID	MW1	QW1	RPD	QW1A	RPD
			Sample Date	2/09/2019			2/09/2019	
	LOR	Unit						
BTEXN								
Benzene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Toluene	0.001	mg/L		< 0.001	< 0.001	0%	<0.002	0%
Ethylbenzene	0.001	mg/L		< 0.001	< 0.001	0%	<0.002	0%
meta- & para-Xylene	0.002	mg/L		< 0.002	< 0.002	0%	<0.002	0%
ortho-Xylene	0.001	mg/L		< 0.001	< 0.001	0%	<0.002	0%
Total Xylenes	0.003	mg/L		< 0.003	< 0.003	0%	<0.002	0%
Naphthalene	0.01	mg/L		< 0.01	< 0.01	0%	<0.005	0%
Total Petroleum Hydrocarbons/Total Recoverable Hydrocarbons								
C6 - C9 Fraction	0.02	mg/L		< 0.02	< 0.02	0%	<0.02	0%
C10 - C14 Fraction	0.05	mg/L		< 0.05	< 0.05	0%	<0.05	0%
C15 - C28 Fraction	0.1	mg/L		< 0.1	< 0.1	0%	<0.1	0%
C29 - C36 Fraction	0.1	mg/L		< 0.1	< 0.1	0%	<0.05	0%
C10 - C36 Fraction (sum)	0.1	mg/L		< 0.1	< 0.1	0%	<0.05	0%
TRH Fraction F1	0.02	mg/L		< 0.02	< 0.02	0%	<0.02	0%
C6 - C10 Fraction	0.02	mg/L		< 0.02	< 0.02	0%	<0.02	0%
>C10 - C16 Fraction	0.05	mg/L		< 0.05	< 0.05	0%	<0.1	0%
>C16 - C34 Fraction	0.1	mg/L		< 0.1	< 0.1	0%	<0.1	0%
>C34 - C40 Fraction	0.1	mg/L		< 0.1	< 0.1	0%	<0.1	0%
TRH Fraction F2	0.05	mg/L		< 0.05	< 0.05	0%	<0.1	0%
Metals								
Arsenic	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Cadmium	0.0	mg/L		< 0.0002	< 0.0002	0%	<0.0001	0%
Chromium	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Copper	0.001	mg/L		**0.002**	**0.018**	**160%**	<0.001	66%
Lead	0.001	mg/L		< 0.001	**0.001**	66%	<0.001	0%
Mercury	0.0001	mg/L		< 0.0001	< 0.0001	0%	<0.0001	0%
Nickel	0.001	mg/L		**0.003**	**0.014**	**129%**	**0.002**	40%
Zinc	0.005	mg/L		**0.011**	**0.07**	146%	**0.006**	59%
Polycyclic Aromatic Hydrocarbons								
Acenaphthene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Acenaphthylene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Anthracene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Benz(a)anthracene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Benzo(a)pyrene	0.001	mg/L		< 0.001	< 0.001	0%	<0.005	0%
Benzo(b+j)fluoranthene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Benzo(g.h.i)perylene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Benzo(k)fluoranthene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Chrysene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Dibenz(a.h)anthracene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Fluoranthene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Fluorene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Indeno(1.2.3.cd)pyrene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Naphthalene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Phenanthrene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Pyrene	0.001	mg/L		< 0.001	< 0.001	0%	<0.001	0%
Sum of PAHs	0.001	mg/L		< 0.001	< 0.001	0%	<0.005	0%
Phenols								
2.4.5-Trichlorophenol	0.001	mg/L		< 0.01	< 0.01	0%	<0.001	0%
2.4.6-Trichlorophenol	0.01	mg/L		< 0.01	< 0.01	0%	<0.001	0%
2.4-Dichlorophenol	0.001	mg/L		< 0.003	< 0.003	0%	<0.001	0%
2.4-Dimethylphenol	0.001	mg/L		< 0.003	< 0.003	0%	<0.001	0%
2.4-Dinitrophenol	0.03	mg/L		< 0.03	< 0.03	0%	-	-
2.6-Dichlorophenol	0.003	mg/L		< 0.003	< 0.003	0%	<0.001	0%
2-Chlorophenol	0.003	mg/L		< 0.003	< 0.003	0%	<0.001	0%
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L		< 0.1	< 0.1	0%	-	-
2-Methyl-4.6-dinitrophenol	0.03	mg/L		< 0.03	< 0.03	0%	-	-
2-Methylphenol (o-Cresol)	0.003	mg/L		< 0.003	< 0.003	0%	<0.001	0%
2-Nitrophenol	0.01	mg/L		< 0.01	< 0.01	0%	<0.001	0%
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L		< 0.006	< 0.006	0%	<0.002	0%
4-Chloro-3-methylphenol	0.01	mg/L		< 0.01	< 0.01	0%	<0.001	0%
4-Nitrophenol	0.03	mg/L		< 0.03	< 0.03	0%	-	-
Dinoseb	0.1	mg/L		< 0.1	< 0.1	0%	-	-
Pentachlorophenol	0.01	mg/L		< 0.01	< 0.01	0%	<0.002	0%
Phenol	0.003	mg/L		< 0.003	< 0.003	0%	<0.001	0%
Tetrachlorophenols - Total	0.03	mg/L		< 0.03	< 0.03	0%	-	-
Total Halogenated Phenol	0.01	mg/L		< 0.01	< 0.01	0%	-	-
Total Non-Halogenated Phenol	0.10	mg/L		< 0.1	< 0.1	0%	-	-

Notes:
High RPDs are shaded
Acceptable RPDs for each LOR multiplier range are: No Limit (<10 x LOR); <30% RPD (Inorganic); and <50% RPD (Organic).
* Eurofins lab report converted from mg/L to ug/L where applicable

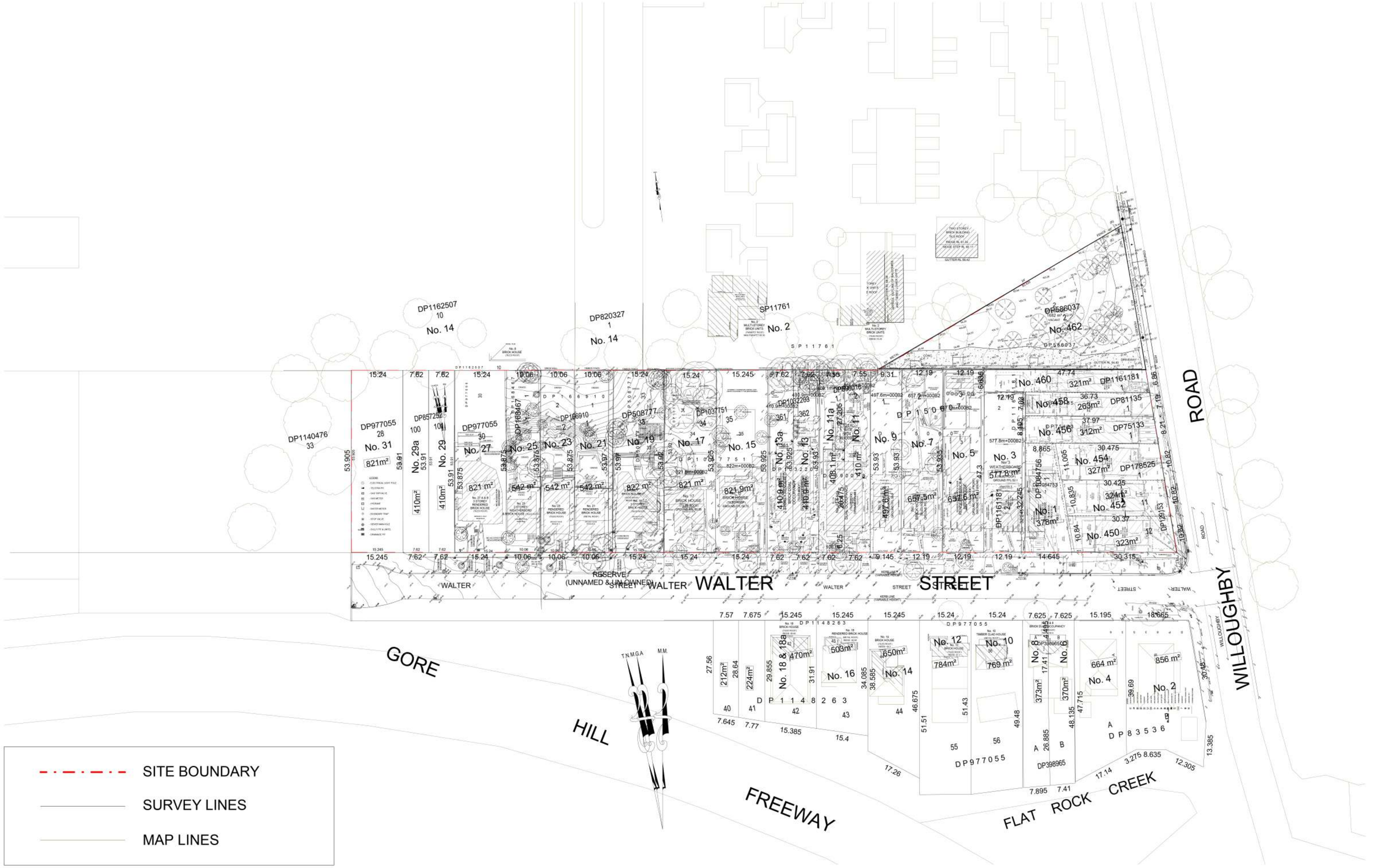
TABLE 9: SUMMARY OF GROUNDWATER TRIP BLANK AND TRIP SPIKE RESULTS
1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

	Sample ID	Trip Spike	Trip Blank
	Sample Date	2/09/2019	2/09/2019
TPH/TRH/BTEX	**LOR**		
Benzene	0.1	95	< 0.001
Toluene	0.1	91	< 0.001
Ethylbenzene	0.1	89	< 0.001
meta- & para-Xylene	0.2	86	< 0.002
ortho-Xylene	0.1	91	< 0.001
Total Xylenes	0.3	88	< 0.003
Naphthalene	0.5	88	< 0.01
TRH C6-C9	20	88	< 0.02
TRH C6-C10	20	94	< 0.02

Notes:
LOR - Limits of Reporting
Recoveries (%) are shown for Trip Spike samples

Appendix A

Site Development Plans and Consent Documents



A.002 **SITE SURVEY**

1 : 500 @A1

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 25/07/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

CASTLE VALE
RESIDENTIAL DEVELOPMENT

SCOTT STREET

WILLOUGHBY ROAD

HALLSTROM
PARK

WALTER STREET
RESERVE

BLDG A
RL +51.70
4

BLDG B
RL +51.20
4
5

BLDG C
RL +53.06
8
7

BLDG D
RL +56.54
8

BLDG E
RL +57.80
8+1

BLDG F
RL +57.80
8+1

BLDG G
RL +58.38
8+1

WALTER STREET

GORE HILL FREEWAY

SP2 SITE

NO.460
NO.458
NO.456
NO.454
NO.452
NO.462
NO.1A
NO.1
NO.3
NO.5
NO.7
NO.9
NO.11
NO.11A
NO.13
NO.15
NO.17
NO.19
NO.21
NO.23
NO.25
NO.27
NO.29
NO.29A
NO.31

KEY

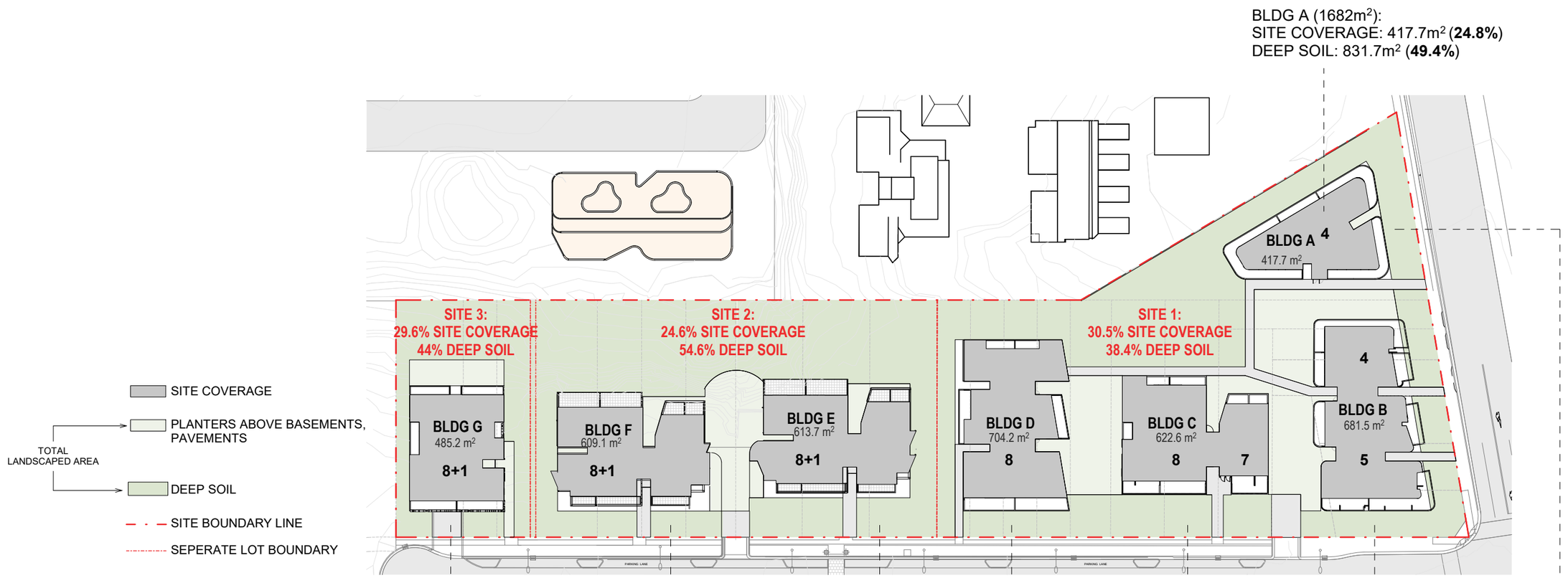
- SITE BOUNDARY
- R3 ZONE BUILT FORM OUTLINE
- SP2 SITE POTENRIAL BUILT FORM
- EXISTING TREES TO BE REMOVED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- STRUCTURE ROOT ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- SITE COVERAGE (EXCL. BALCONIES, ARTICULATION & EAVES)
- RECREATIONAL OUTDOOR AREA

A.050 **SITE CONTEXT PLAN**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN

ISSUE



TOTAL AMALGAMATED SITE

TOTAL SITE AREA : 14570.4m²
SITE COVERAGE: 4134 m² (**28.4%**)

TOTAL LANDSCAPED AREA =
8406.0 m² (57.7% OF SITE)

OF WHICH 6540.4 m² IS DEEP SOIL
(**45.2%** OF SITE)

SITE 3: BLDG G
(NO. 29-31 WALTER STREET)

SITE AREA : 1641m²
SITE COVERAGE: 485.2 m²(**29.6%**)

TOTAL LANDSCAPED AREA =
957.7 m²(58.4% OF SITE)

OF WHICH 772.9 m² IS DEEP SOIL
(**44%** OF SITE)

SITE 2: BLDG E+F
(NO. 15-27 WALTER STREET)

SITE AREA : 4969 m² (Including 66 m² Easement)
SITE COVERAGE: 1222.8 m² (**24.6%**)

TOTAL LANDSCAPED AREA =
3204.7 m²(64.5 % OF SITE)

OF WHICH 2712 m² IS DEEP SOIL
(**54.6%** OF SITE)

SITE 1: BLDG A+B+C+D
(NO. 1-13A WALTER STREET &
NO.452-462 WILLOUGHBY ROAD)

SITE AREA : 7960.4m²
SITE COVERAGE: 2426 m² (**30.5%**)

TOTAL LANDSCAPED AREA =
4242.5 m² (53.3% OF SITE)

OF WHICH 3055.5 m² IS DEEP SOIL
(**38.4%** OF SITE)

A.051 SITE PLAN - SITE COVERAGE CALCULATION

As indicated @A1

KEY

- SITE BOUNDARY
- SP2 SITE POTENRIAL BUILT FORM
- EXISTINGS TREES TO BE REMAINED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- NEW TREES PROPOSED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- RECREATIONAL OUTDOOR AREA

Room Legend

- 1 BED
- 2 BED
- 3 BED
- B

A.100 **GROUND FLOOR**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

SCOTT STREET

CASTLE VALE
RESIDENTIAL DEVELOPMENT

WILLOUGHBY ROAD

HALLSTROM
PARK

WALTER STREET
RESERVE

BLDG A
RL 54.80

BLDG G
RL 61.48

BLDG F
RL 61.92

BLDG E
RL 61.92

BLDG D
RL 59.64

BLDG C
RL 56.11

BLDG B
RL 54.30
RL 54.30

WALTER STREET

GORE HILL FREEWAY

SP2 SITE

KEY

- SITE BOUNDARY
- SP2 SITE POTENRIAL BUILT FORM
- EXISTINGS TREES TO BE REMAINED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- NEW TREES PROPOSED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- RECREATIONAL OUTDOOR AREA

Room Legend

- 1 BED
- 2 BED
- 3 BED
- B

A.101 **LEVEL 1 - 2**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

SCOTT STREET

CASTLE VALE
RESIDENTIAL DEVELOPMENT

WILLOUGHBY ROAD

HALLSTROM
PARK

BLDG A

BLDG B

BLDG C

BLDG D

BLDG E

BLDG F

BLDG G

WALTER STREET

WALTER STREET
RESERVE

GORE HILL FREEWAY

SP2 SITE

KEY

- SITE BOUNDARY
- SP2 SITE POTENRIAL BUILT FORM
- EXISTINGS TREES TO BE REMAINED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- NEW TREES PROPOSED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- RECREATIONAL OUTDOOR AREA

Room Legend

- 1 BED
- 2 BED
- 3 BED
- B

A.102 **LEVEL 3**
1 : 500 @A1

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WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

A.103 **LEVEL 4**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

SCOTT STREET

CASTLE VALE
RESIDENTIAL DEVELOPMENT

WILLOUGHBY ROAD

HALLSTROM
PARK

BLDG A

BLDG G

BLDG F

BLDG E

BLDG D

BLDG C

BLDG B

WALTER STREET

WALTER STREET
RESERVE

GORE HILL FREEWAY

SP2 SITE

KEY

- SITE BOUNDARY
- SP2 SITE POTENRIAL BUILT FORM
- EXISTINGS TREES TO BE REMAINED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- NEW TREES PROPOSED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- RECREATIONAL OUTDOOR AREA

Room Legend

- 1 BED
- 2 BED
- 3 BED
- B

A.104 **LEVEL 5 - 6**
1 : 500 @A1

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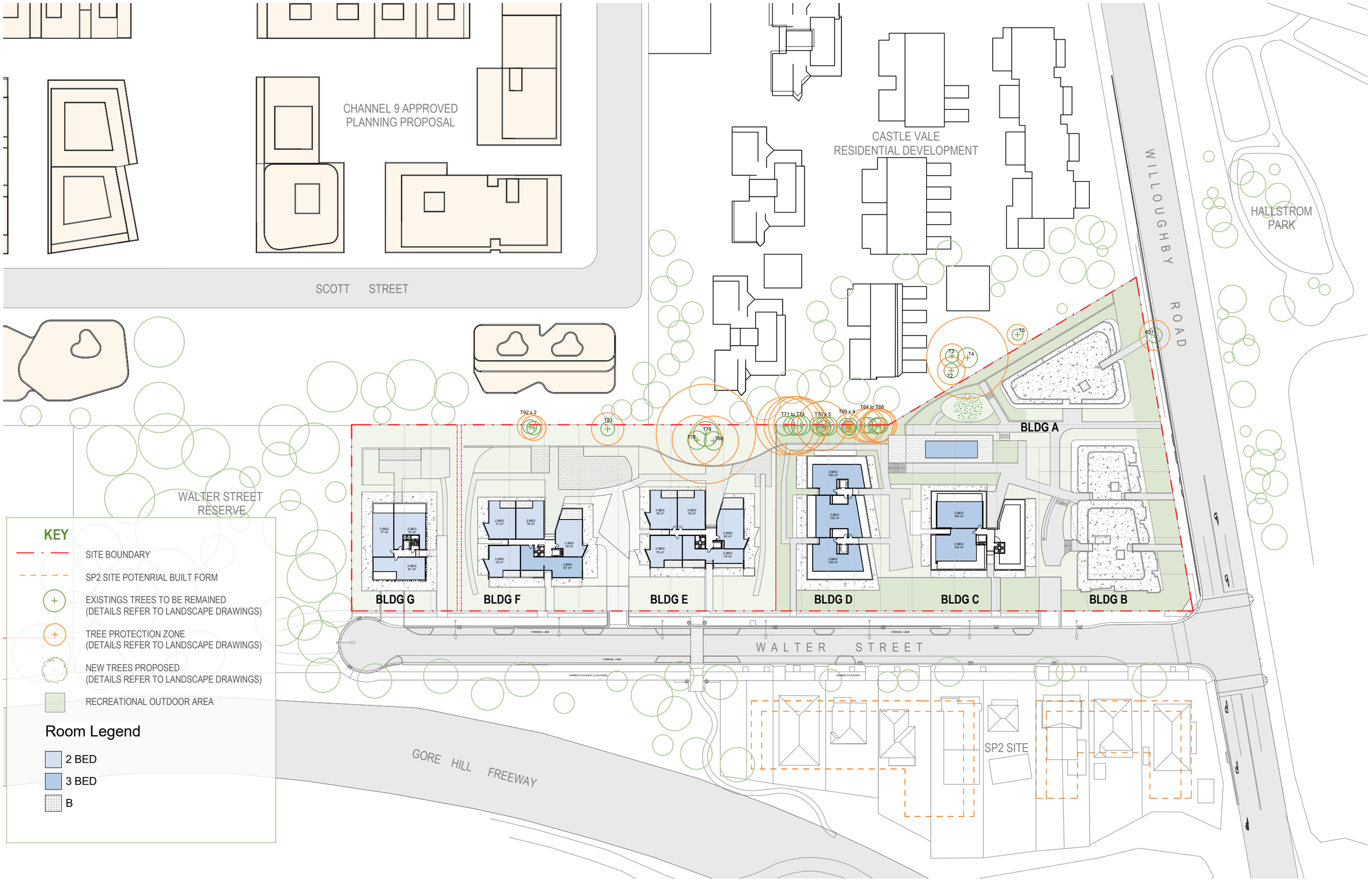


A.105 **LEVEL 7**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

SCOTT STREET

CASTLE VALE
RESIDENTIAL DEVELOPMENT

WILLOUGHBY ROAD

HALLSTROM
PARK

BLDG A

BLDG G

BLDG F

BLDG E

BLDG D

BLDG C

BLDG B

WALTER STREET

WALTER STREET
RESERVE

GORE HILL FREEWAY

SP2 SITE

T92 x 2
T83
T79
T78
T80
T71 to T74
T70 x 5
T69 x 4
T64 to T68
T5
T27
T3
T4
T2

KEY

- SITE BOUNDARY
- SP2 SITE POTENRIAL BUILT FORM
- EXISTINGS TREES TO BE REMAINED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- TREE PROTECTION ZONE (DETAILS REFER TO LANDSCAPE DRAWINGS)
- NEW TREES PROPOSED (DETAILS REFER TO LANDSCAPE DRAWINGS)
- RECREATIONAL OUTDOOR AREA

Room Legend

- 3 BED

A.106 **LEVEL 8**
1 : 500 @A1

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

CHANNEL 9 APPROVED
PLANNING PROPOSAL

SCOTT STREET

CASTLE VALE
RESIDENTIAL DEVELOPMENT

WILLOUGHBY ROAD

HALLSTROM
PARK

BLDG A
4
+64.55 (PARAPET)
+65.36 (TOP OF PLANT)
+61.85 (PARAPET)

BLDG G
8+1
+86.58 (PARAPET)
+87.40 (TOP OF PLANT)
+83.63 (PARAPET)
+68.83 (PARAPET)

BLDG F
8+1
+87.15 (PARAPET)
+87.98 (TOP OF PLANT)
+84.05 (PARAPET)
+69.25 (PARAPET)

BLDG E
8+1
+87.15 (PARAPET)
+87.98 (TOP OF PLANT)
+84.05 (PARAPET)
+69.25 (PARAPET)

BLDG D
8
+81.64 (PARAPET)
+82.44 (TOP OF PLANT)
+79.24 (PARAPET)
+66.99 (PARAPET)

BLDG C
8
7
+78.26 (PARAPET)
+78.76 (TOP OF PLANT)
+75.16 (PARAPET)
+63.46 (PARAPET)

BLDG B
4
5
+64.05 (PARAPET)
+64.86 (TOP OF PLANT)
+67.15 (PARAPET)
+67.96 (TOP OF PLANT)
+61.65 (PARAPET)

WALTER STREET

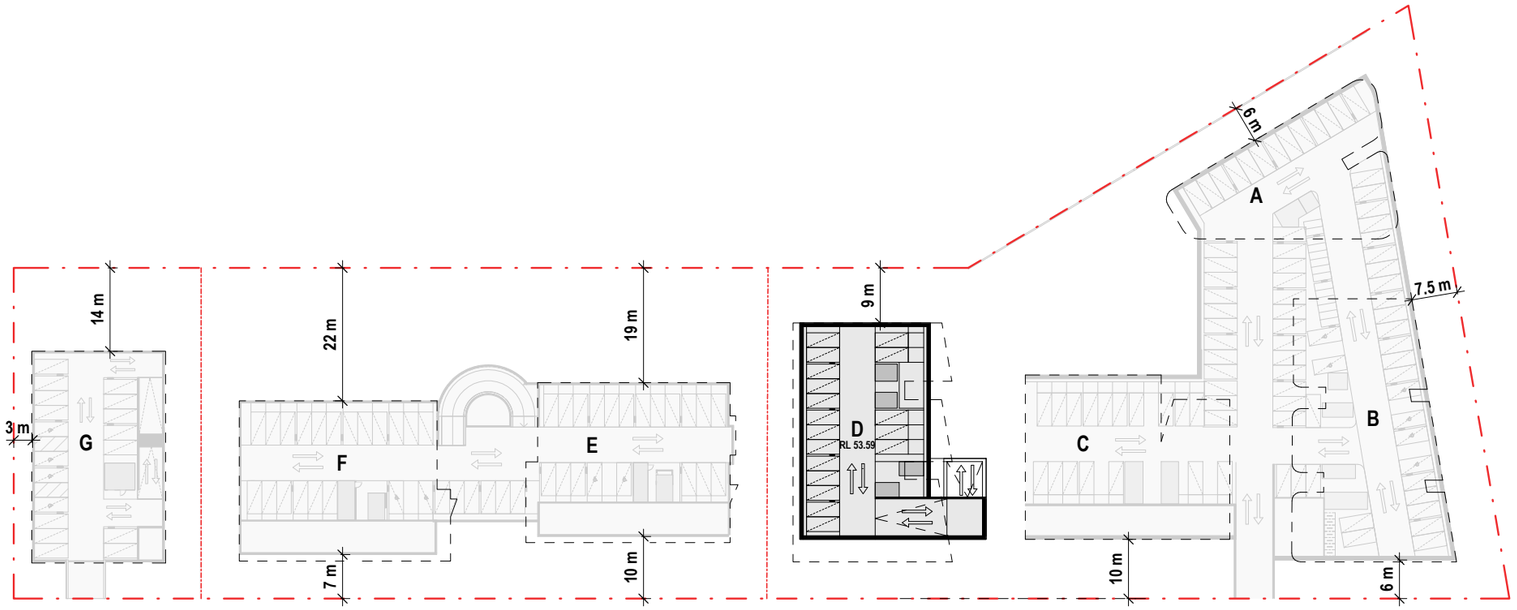
GORE HILL FREEWAY

SP2 SITE

KEY

- SITE BOUNDARY
- ENVELOPE DIMENSIONS & BUILDING SEBACKS
- MINIMUM BUILDING SEPERATIONS
- BOUNDARY SETBACKS
- COMMUNUAL OPEN SPACE DIMENSIONS
- BUILDING ENVELOPE (INCL. BALCONIES & ARTICULATION)
- COMMUNUAL OPEN SPACE

A.107 **ROOF PLAN - BUILDING ENVELOPE PLAN**
1 : 500 @A1



TOTAL AMALGAMATED SITE

TOTAL CARPARK SPACE: 332

NOTES: CAR PARKING RATE IS BASED ON 1 SPACE PER 1-BED UNIT, 1 SPACE PER 2-BED UNIT, 1.25 SPACE PER 3-BED UNIT, 1 VISITOR PARKING FOR EACH 4 UNITS AND 25% OF ADAPTABLE UNITS SHOULD HAVE DISABLED ACCESSIBLE CARPARK SPACES AS PER WILLOUGHBY DCP.

SITE 3: BLDG G
(NO. 29-31 WALTER STREET)

GF CARPARK SPACE: 11
B1 CARPARK SPACE: 18
B2 CARPARK SPACE: 10

TOTAL: 39

SITE 2: BLDG E+F
(NO. 15-27 WALTER STREET)

GF CARPARK SPACE: 20
B1 CARPARK SPACE: 46
B2 CARPARK SPACE: 48

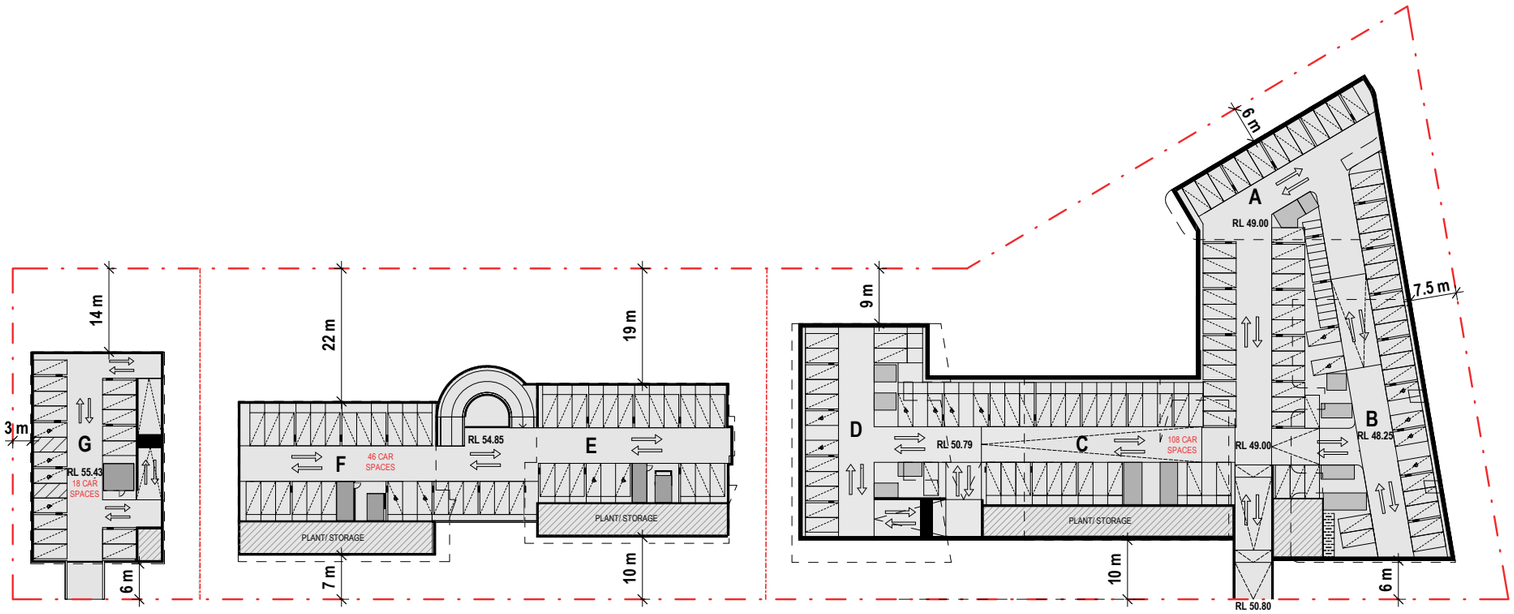
TOTAL: 114

SITE 1: BLDG A+B+C+D
(NO. 1-13A WALTER STREET &
NO.452-462 WILLOUGHBY ROAD)

B0 CARPARK SPACE: 18
B1 CARPARK SPACE: 108
B2 CARPARK SPACE: 53

TOTAL: 179

A.120 **BASEMENT 0 CARPARK**
1 : 500 @A1



TOTAL AMALGAMATED SITE

TOTAL CARPARK SPACE: 332

NOTES: CAR PARKING RATE IS BASED ON 1 SPACE PER 1-BED UNIT, 1 SPACE PER 2-BED UNIT, 1.25 SPACE PER 3-BED UNIT, 1 VISITOR PARKING FOR EACH 4 UNITS AND 25% OF ADAPTABLE UNITS SHOULD HAVE DISABLED ACCESSIBLE CARPARK SPACES AS PER WILLOUGHBY DCP.

SITE 3: BLDG G
(NO. 29-31 WALTER STREET)

GF CARPARK SPACE: 11
B1 CARPARK SPACE: 18
B2 CARPARK SPACE: 10

TOTAL: 39

SITE 2: BLDG E+F
(NO. 15-27 WALTER STREET)

GF CARPARK SPACE: 20
B1 CARPARK SPACE: 46
B2 CARPARK SPACE: 48

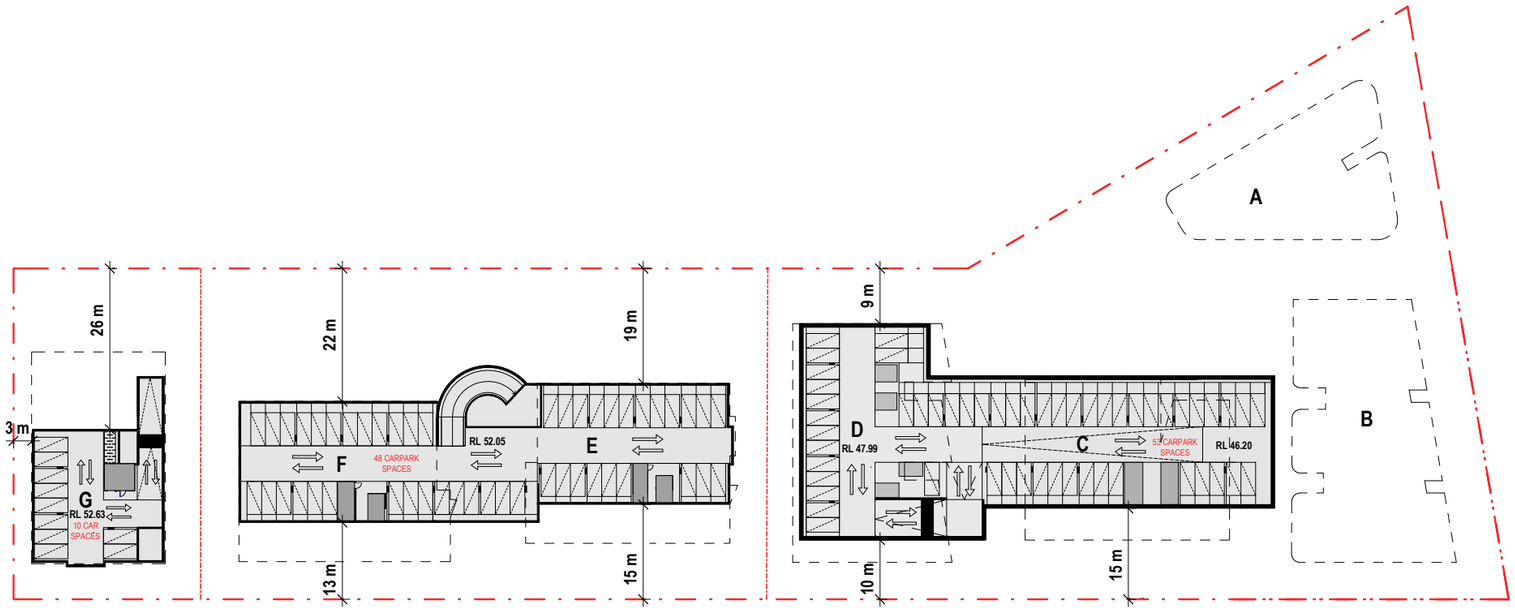
TOTAL: 114

SITE 1: BLDG A+B+C+D
(NO. 1-13A WALTER STREET &
NO.452-462 WILLOUGHBY ROAD)

B0 CARPARK SPACE: 18
B1 CARPARK SPACE: 108
B2 CARPARK SPACE: 53

TOTAL: 179

A.121 **BASEMENT 1 CARPARK**
1 : 500 @A1



TOTAL AMALGAMATED SITE

TOTAL CARPARK SPACE: 332

NOTES: CAR PARKING RATE IS BASED ON 1 SPACE PER 1-BED UNIT, 1 SPACE PER 2-BED UNIT, 1.25 SPACE PER 3-BED UNIT, 1 VISITOR PARKING FOR EACH 4 UNITS AND 25% OF ADAPTABLE UNITS SHOULD HAVE DISABLED ACCESSIBLE CARPARK SPACES AS PER WILLOUGHBY DCP.

SITE 3: BLDG G
(NO. 29-31 WALTER STREET)

GF CARPARK SPACE: 11
B1 CARPARK SPACE: 18
B2 CARPARK SPACE: 10

TOTAL: 39

SITE 2: BLDG E+F
(NO. 15-27 WALTER STREET)

GF CARPARK SPACE: 20
B1 CARPARK SPACE: 46
B2 CARPARK SPACE: 48

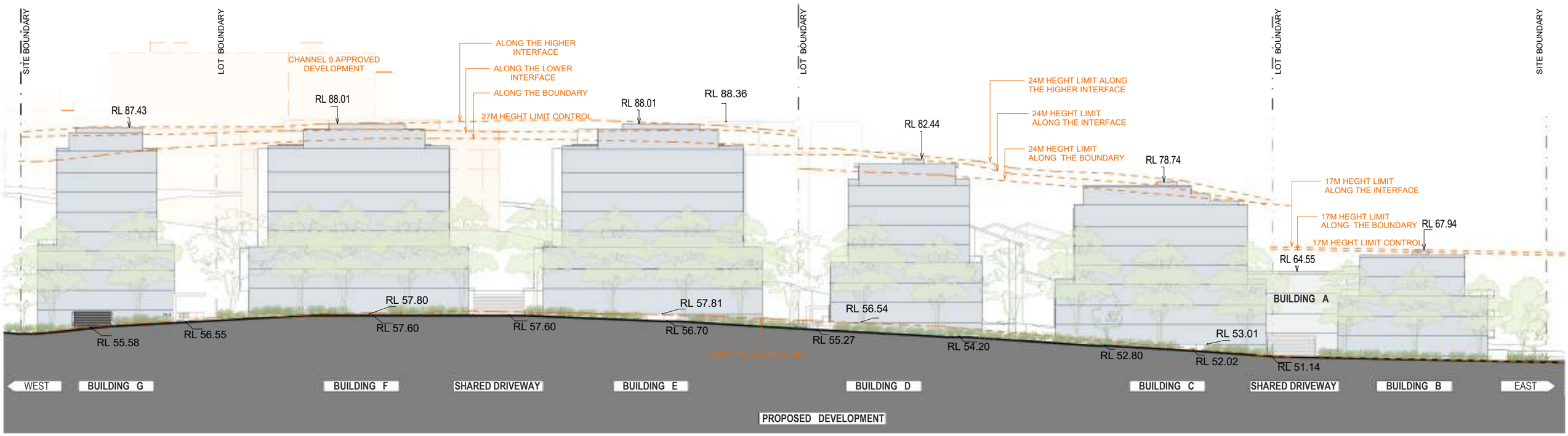
TOTAL: 114

SITE 1: BLDG A+B+C+D
(NO. 1-13A WALTER STREET &
NO.452-462 WILLOUGHBY ROAD)

B0 CARPARK SPACE: 18
B1 CARPARK SPACE: 108
B2 CARPARK SPACE: 53

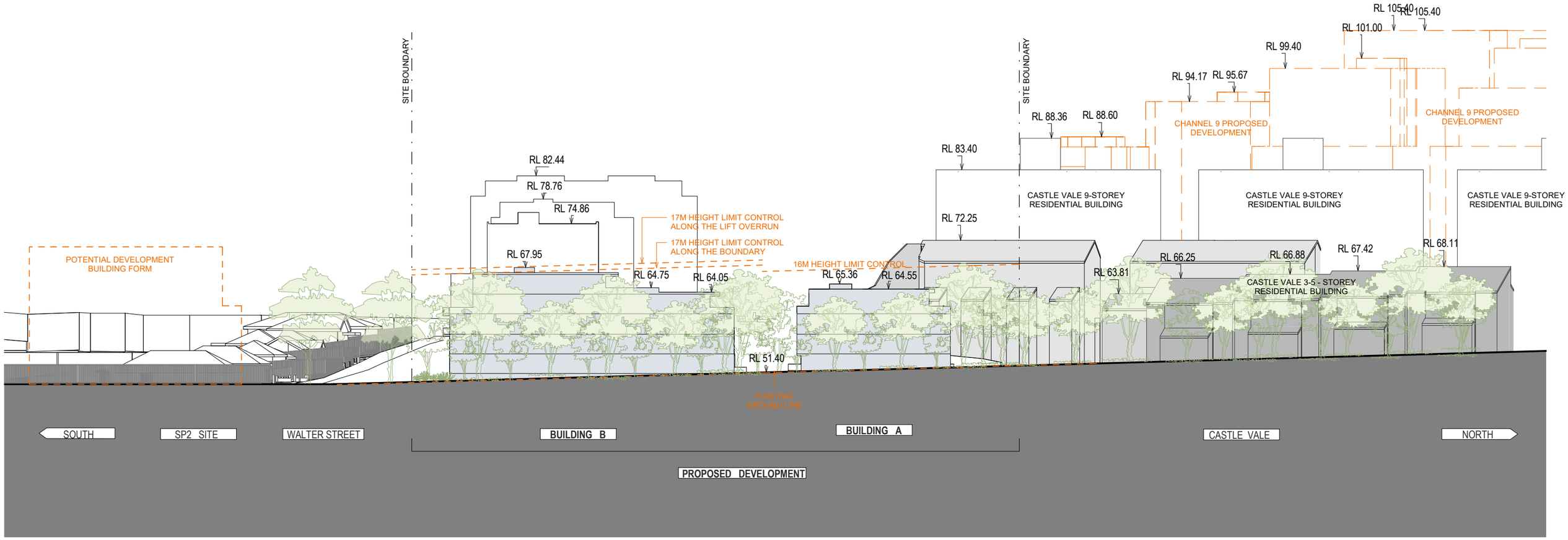
TOTAL: 179

A.122 **BASEMENT 2 CARPARK**
1 : 500 @A1



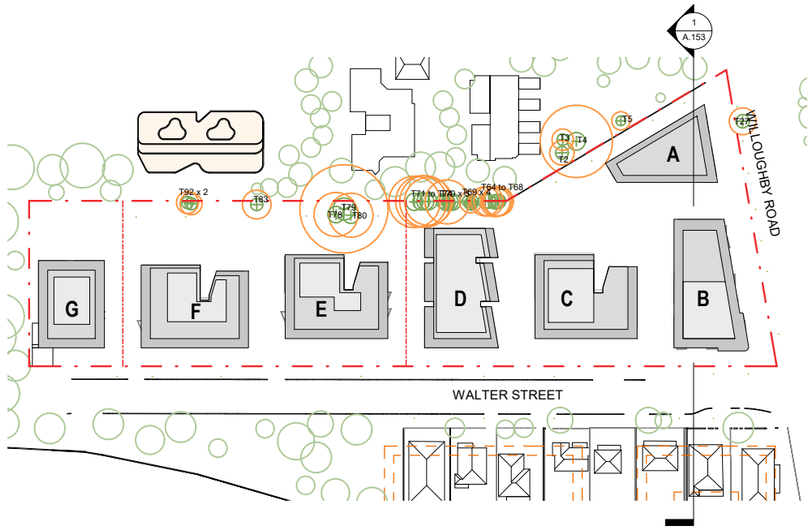
A.151 WALTER STREET SOUTH ELEVATION

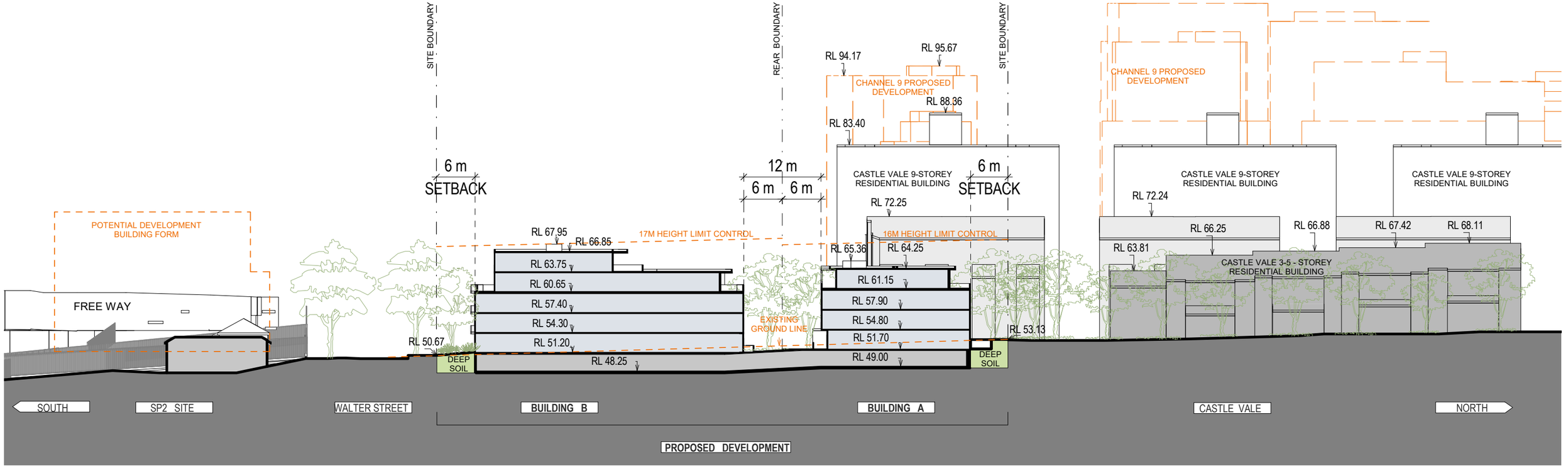
1 : 300 @A1



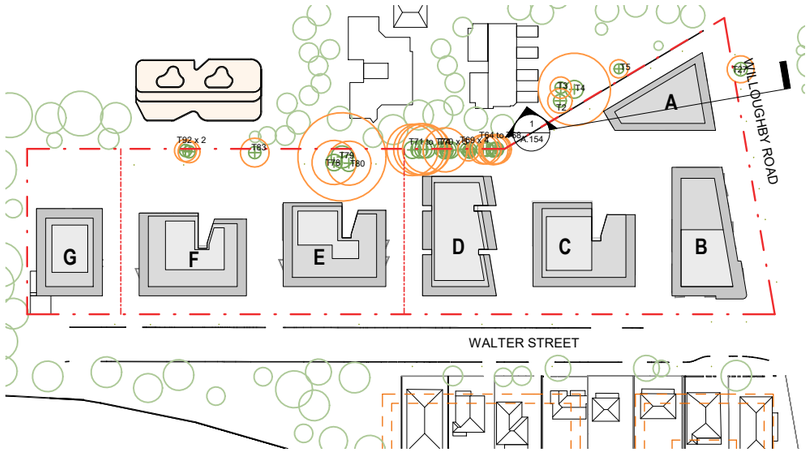
A.152 WILLOUGHBY ROAD EAST ELEVATION

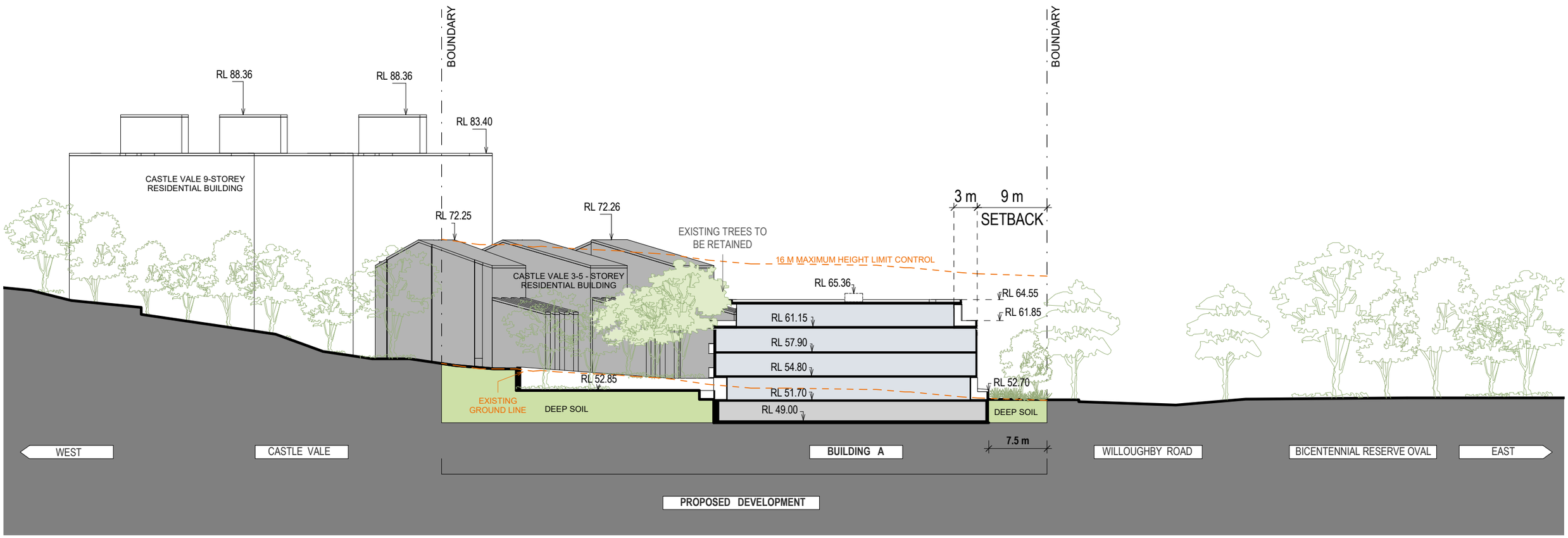
1 : 300 @A1





A.153 **LONG SECTION SITE A-B** 1:300 @ A1
As indicated @A1 1:600 @ A3





A.154 **CROSS SECTION A (NO. 462)** 1:250 @ A1
As indicated @A1 1:500 @ A3

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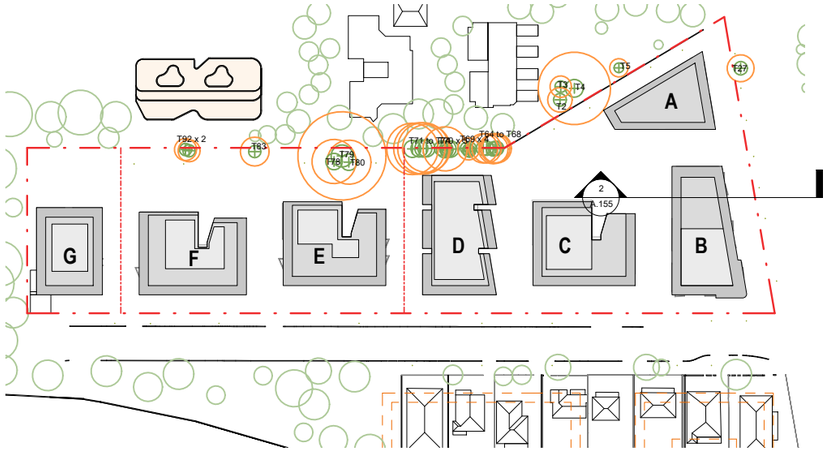
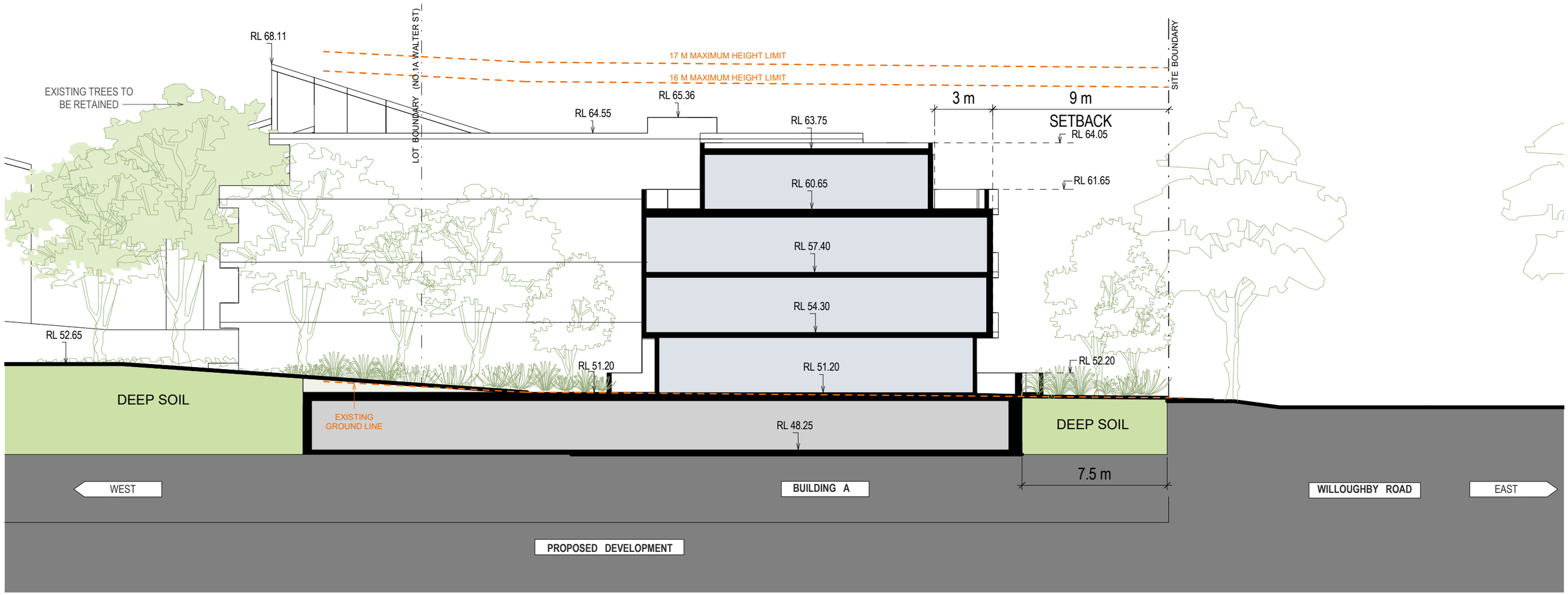
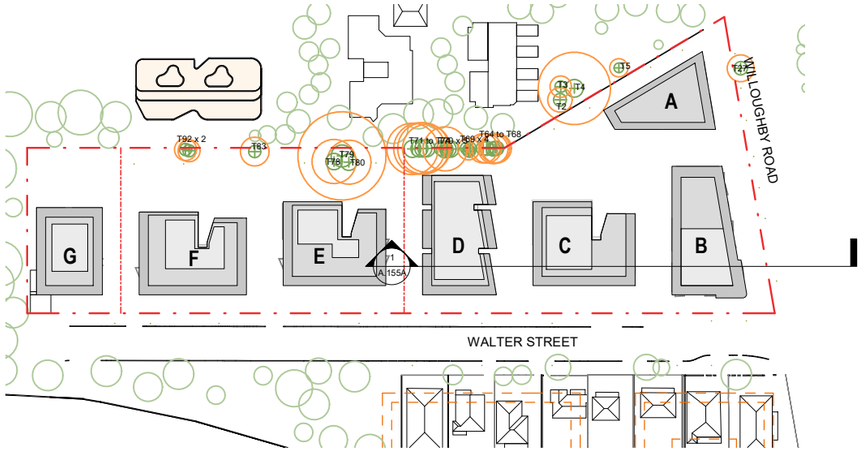
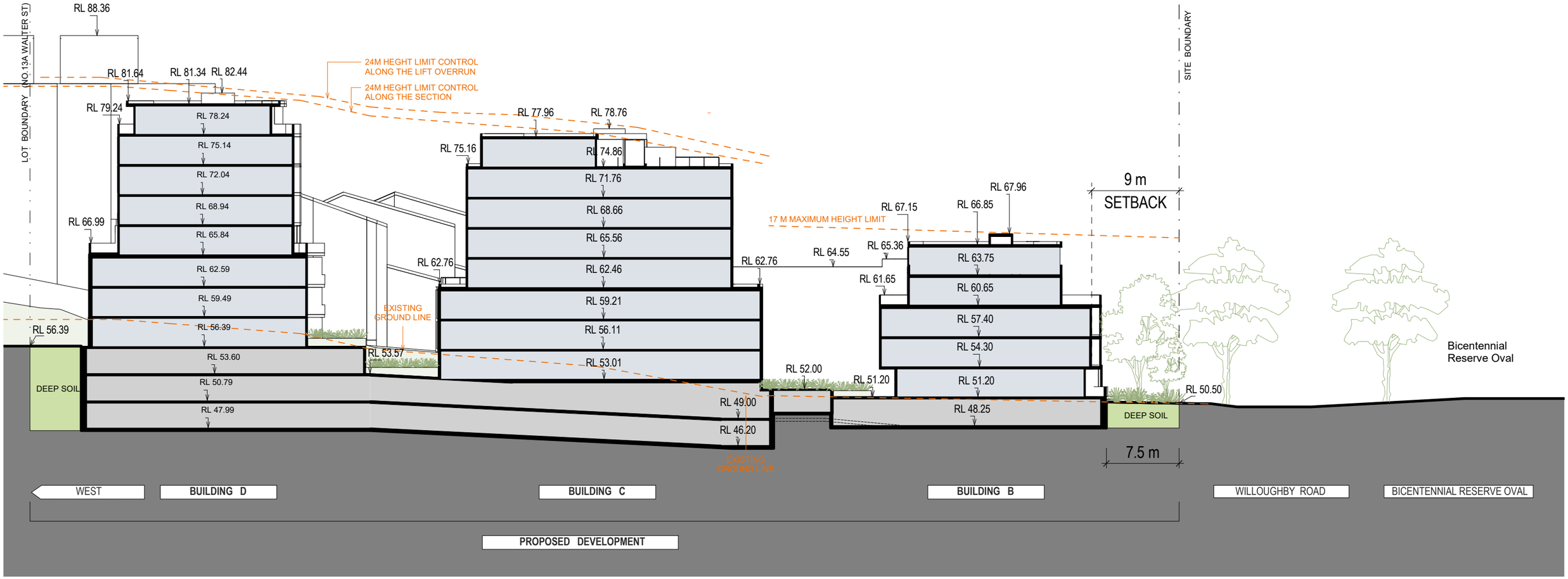




A.155 **CROSS SECTION B-1 (NO.452-460)**

As indicated @A1

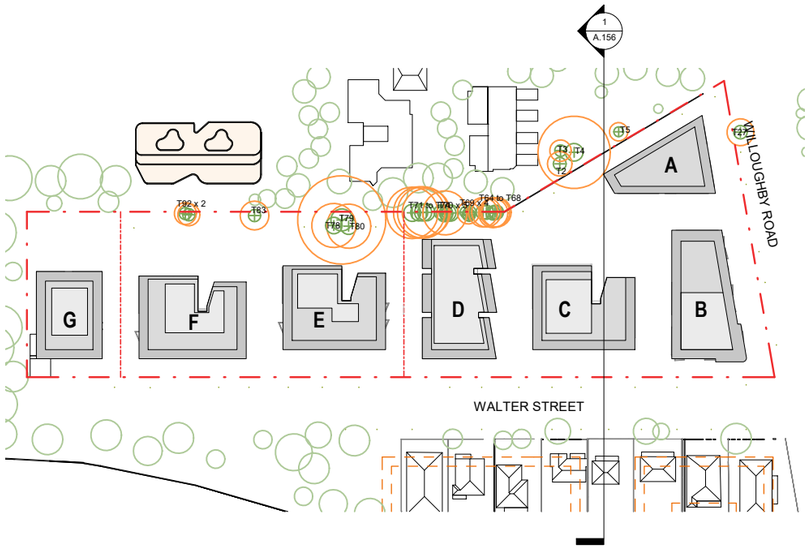


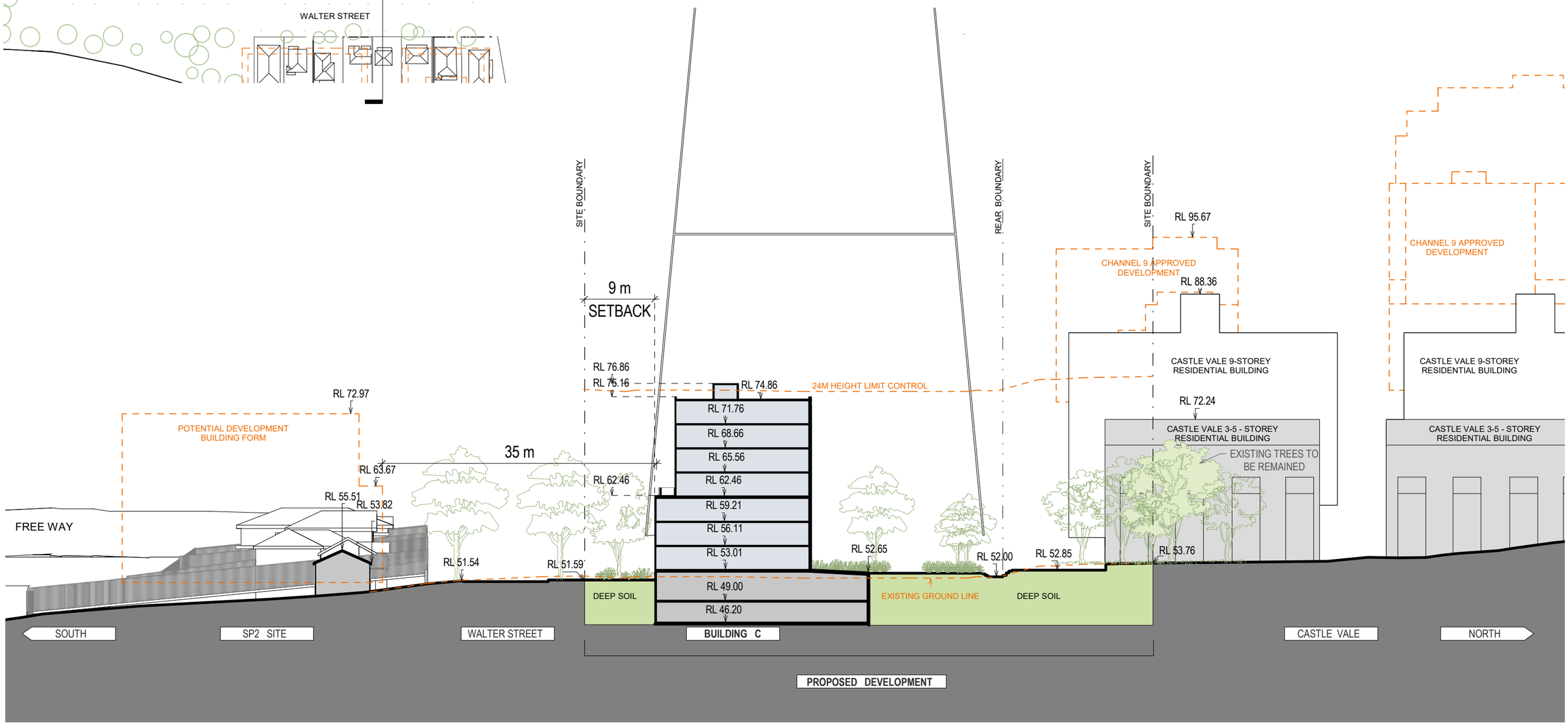


A.155A **CROSS SECTION B-2 (NO.452-460)**

As indicated @A1

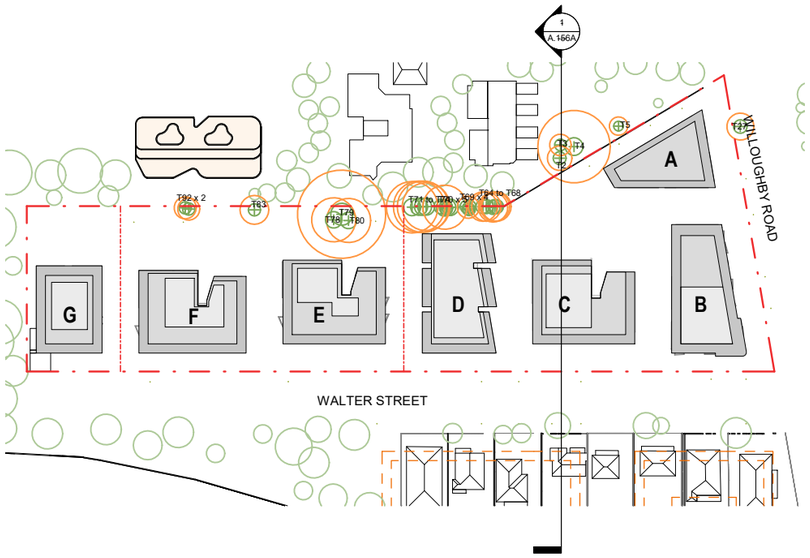
1:200 @ A1
1:400 @ A3



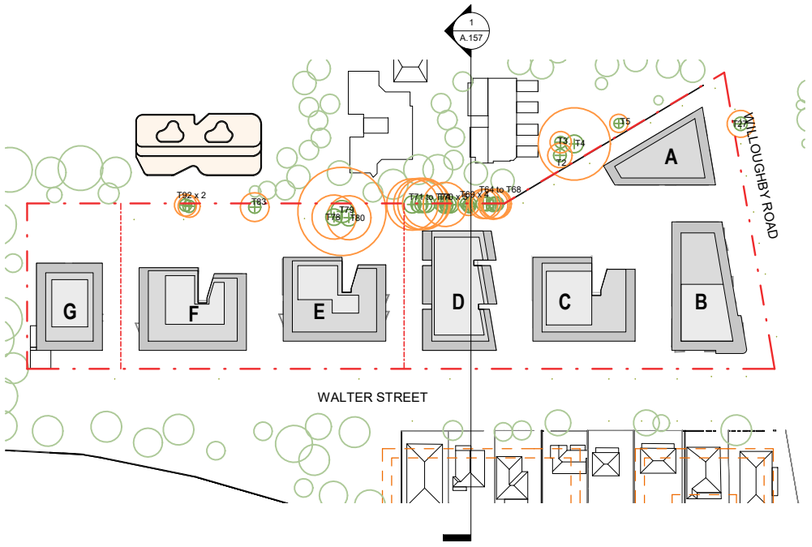


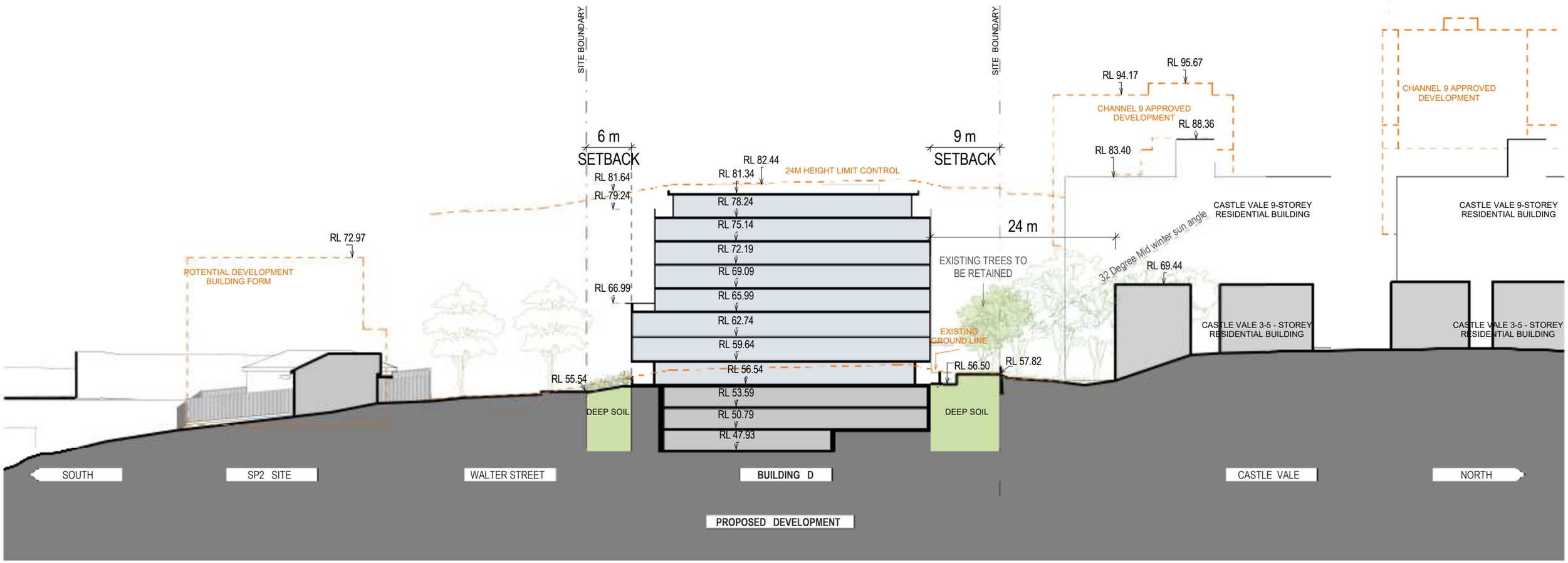
A.156 **CROSS SECTION C-1 (NO. 3-9)** 1:250 @ A1
As indicated @A1 1:500 @ A3

AU ARCHITECTURE URBANEIA WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019



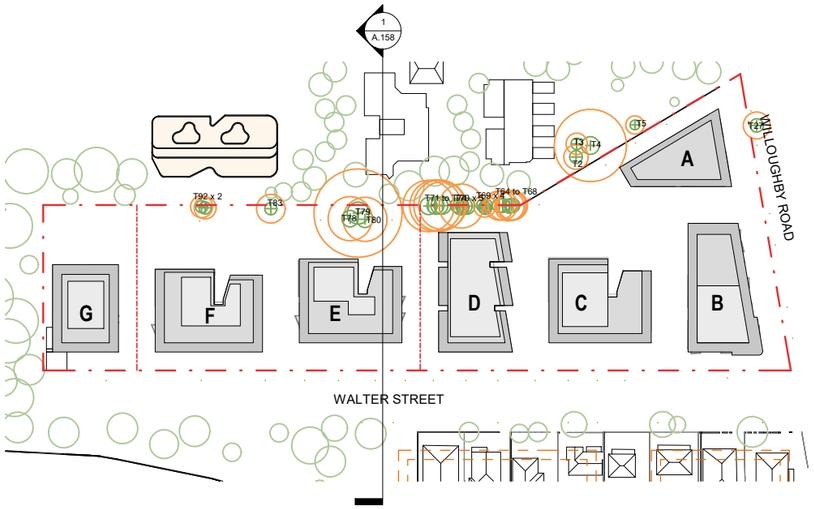
A.156A **CROSS SECTION C-2 (NO. 3- 9)** 1:250 @ A1
As indicated @A1 1:500 @ A3

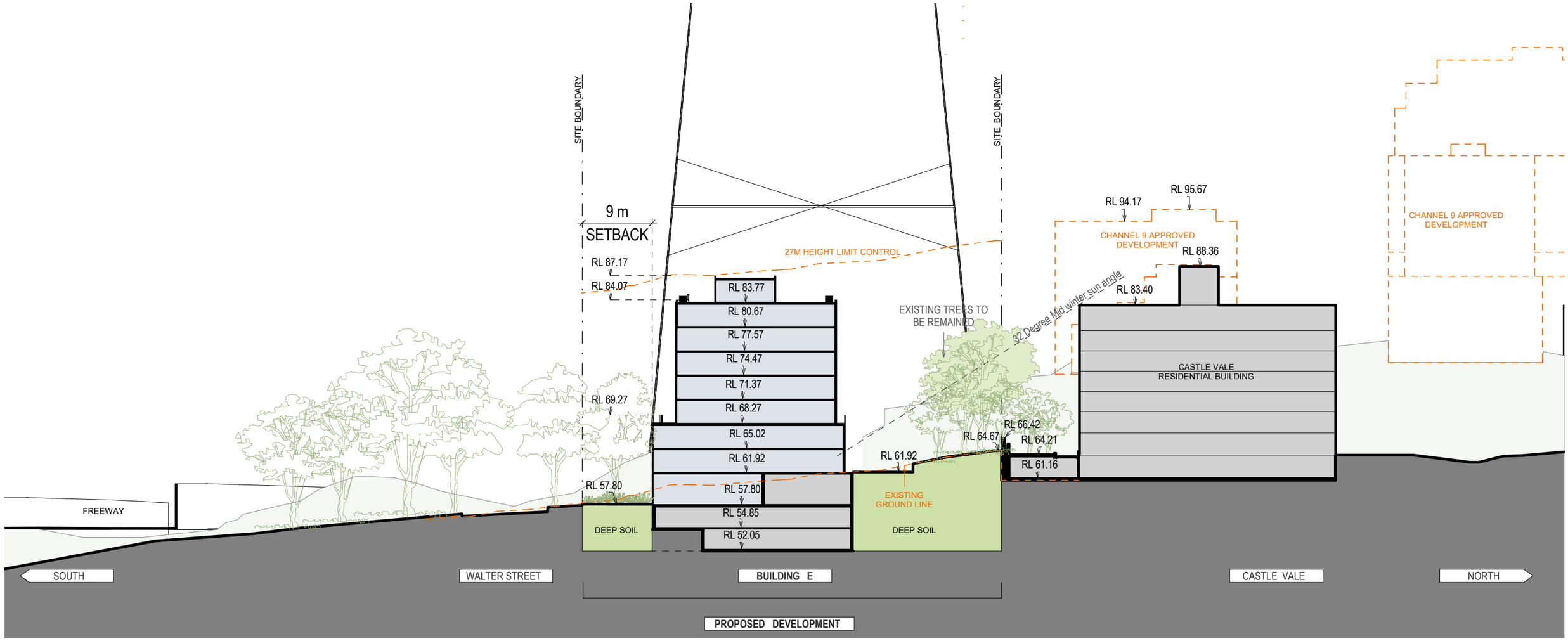




A.157 **CROSS SECTION D (NO. 11-13A)** 1:250 @ A1
As indicated @A1 1:500 @ A3

AU ARCHITECTURE URBANEIA

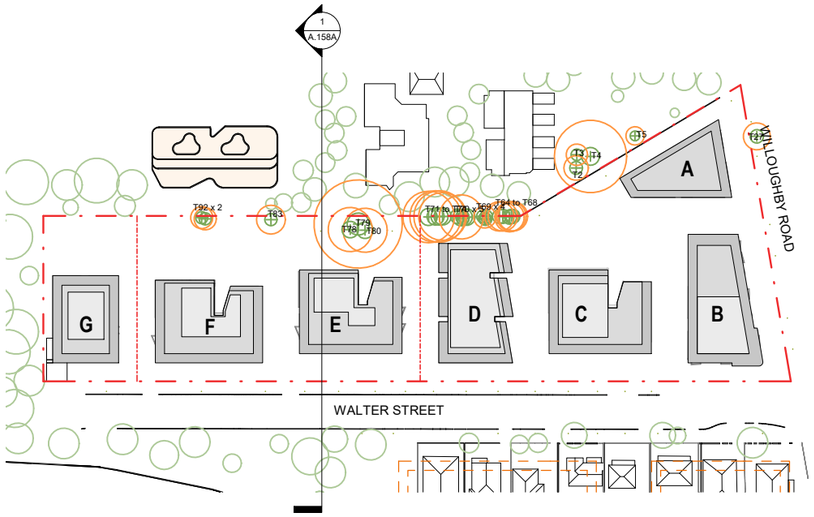


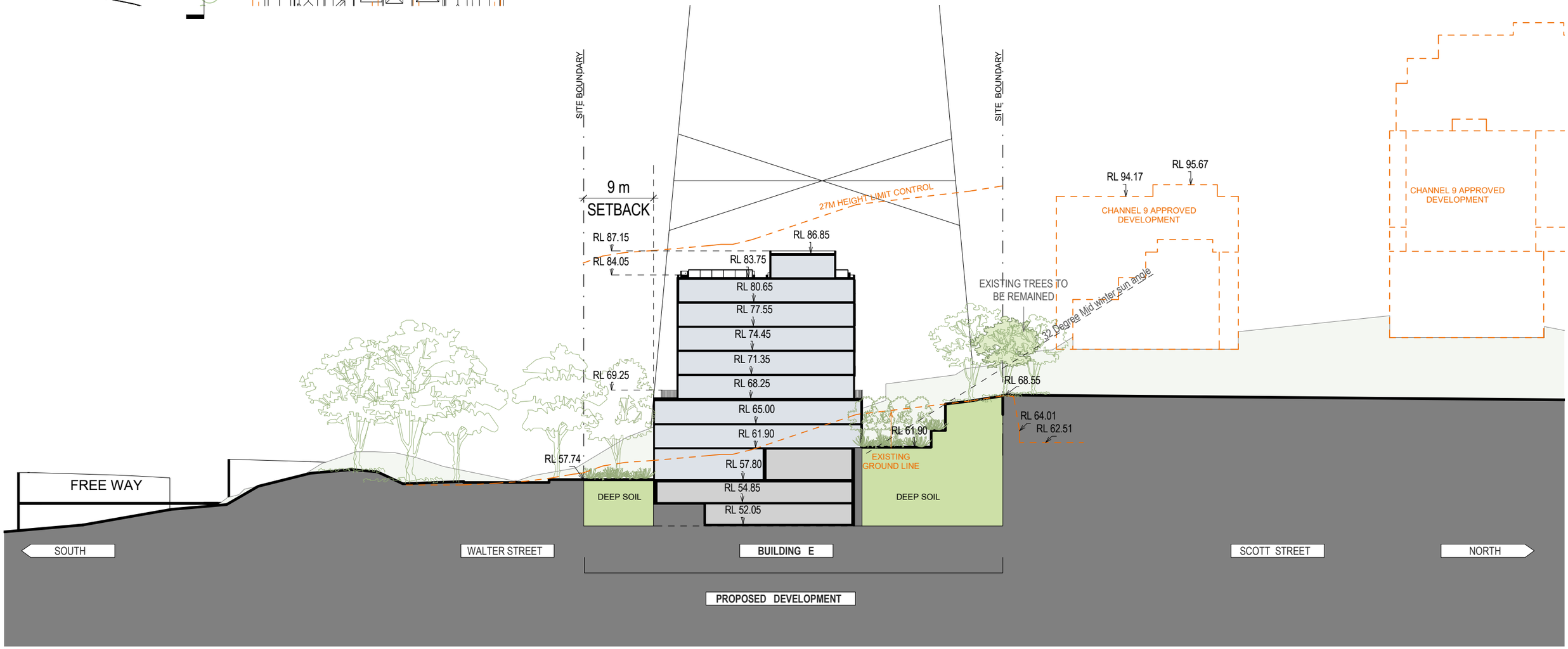


A.158 **CROSS SECTION E-1 (NO.15-19)** 1:250 @ A1
As indicated @A1 1:500 @ A3

AU ARCHITECTURE URBANEIA

WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019





A.158A **CROSS SECTION E-2 (NO.15-19)** 1:250 @ A1
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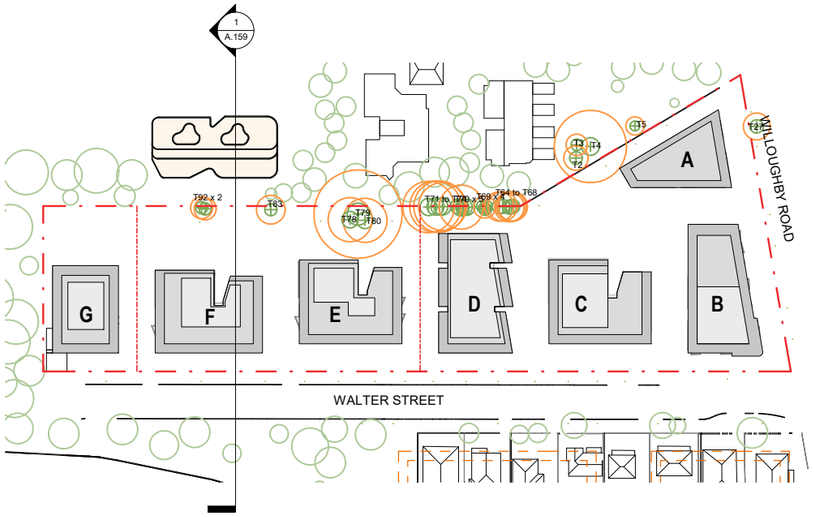
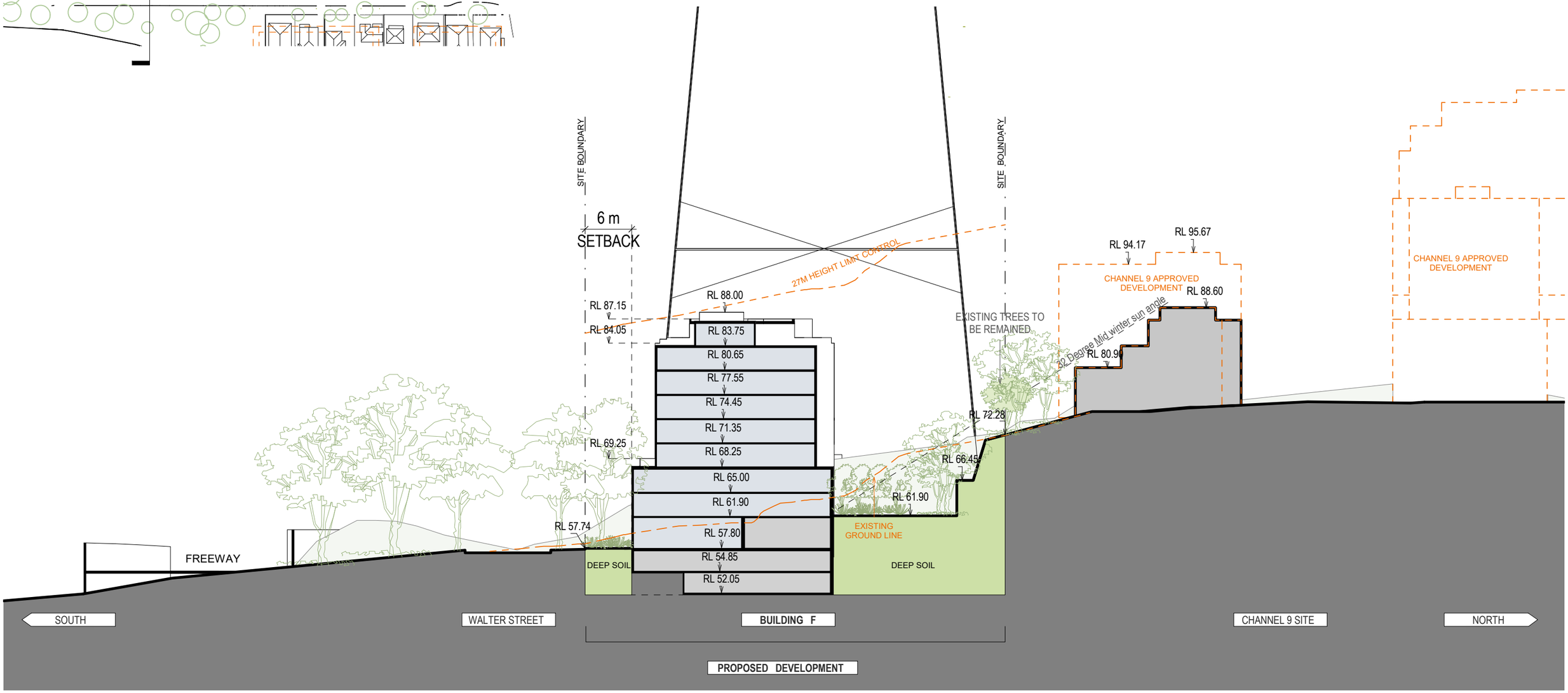
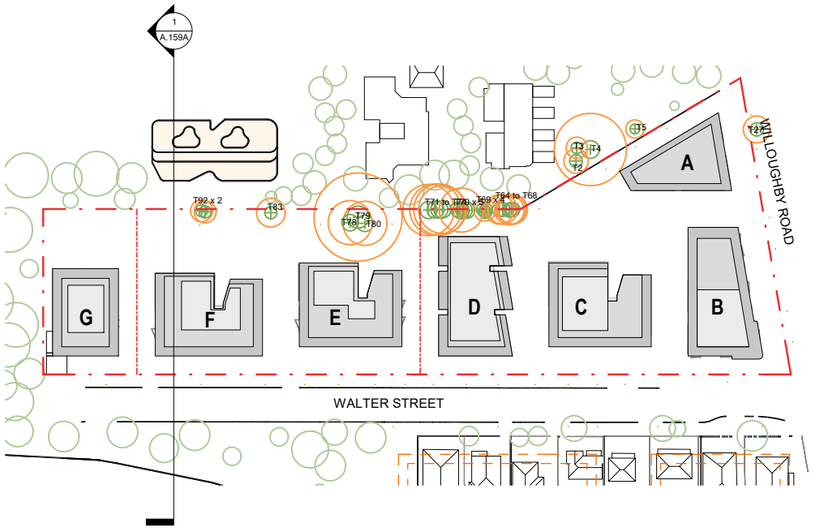
AU ARCHITECTURE URBANEIA WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019

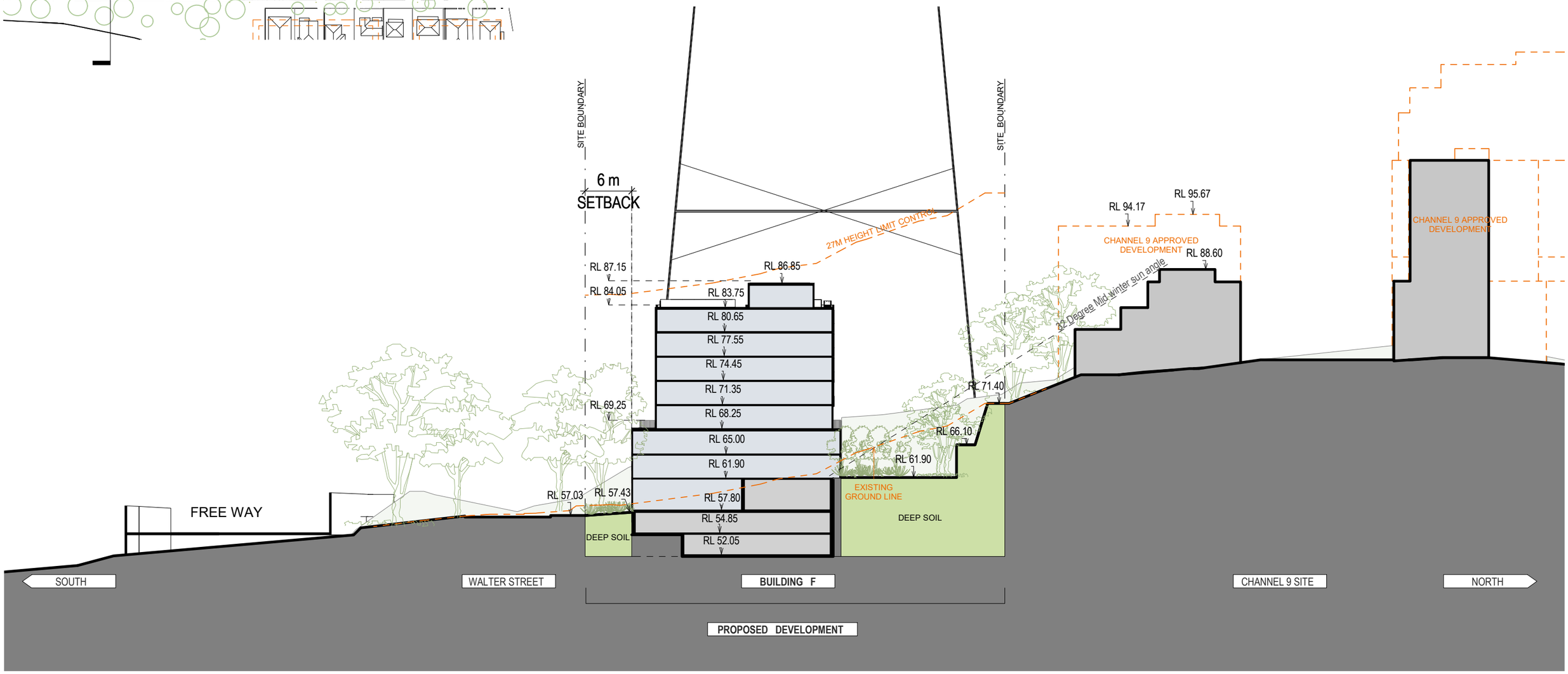




A.159 **CROSS SECTION F-1 (NO. 21-27)** 1:250 @ A1
As indicated @A1 1:500 @ A3

AU ARCHITECTURE URBANEIA WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019





A.159A **CROSS SECTION F-2 (NO.21-27)** 1:250 @ A1
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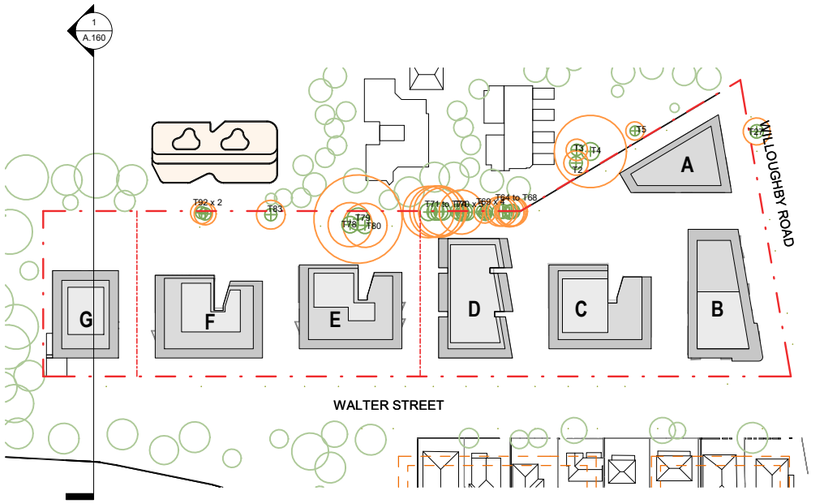
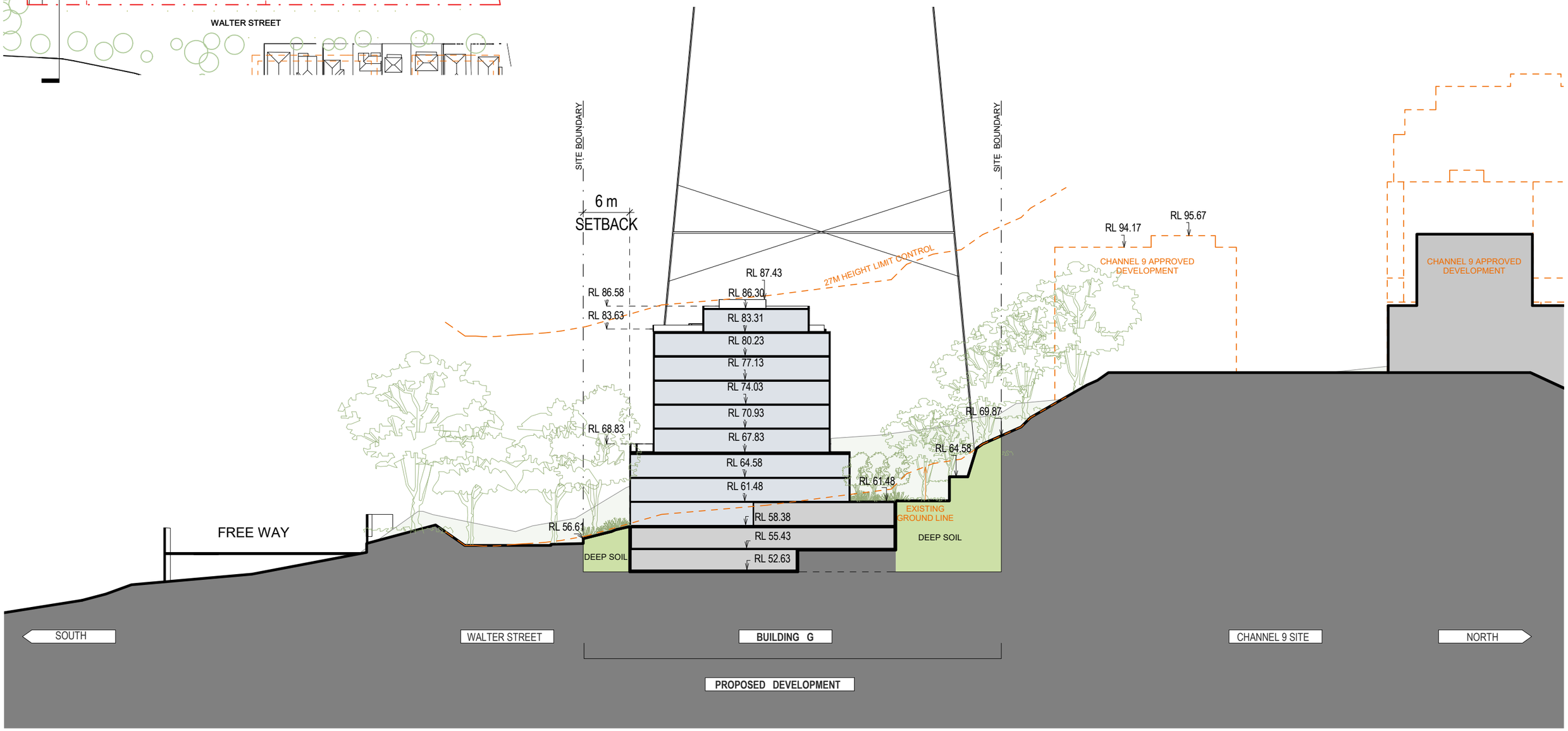
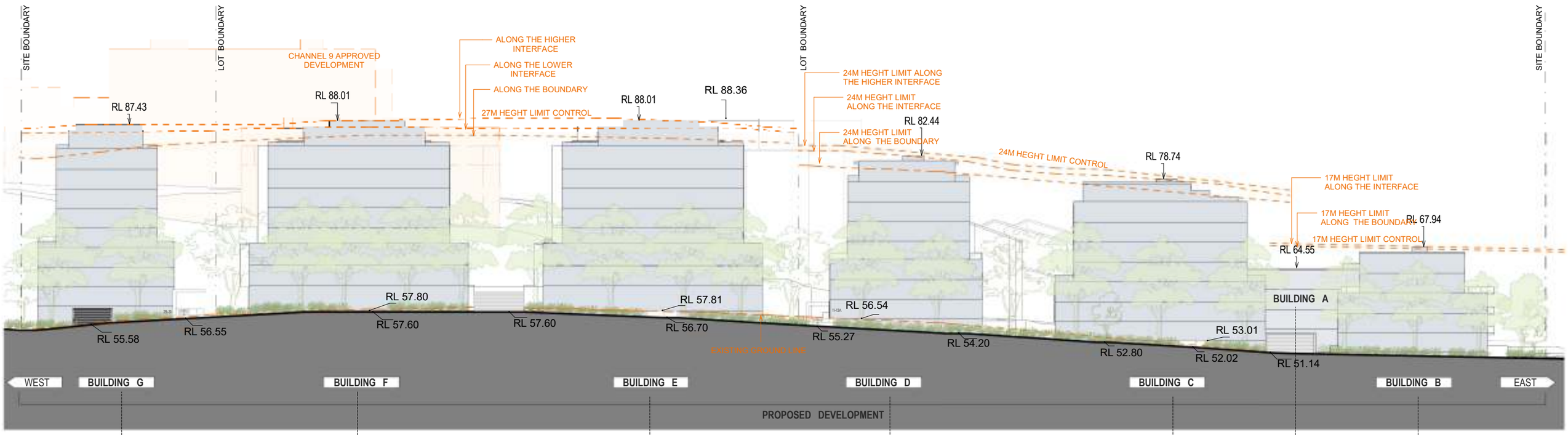




A.160 **CROSS SECTION G (NO.29-31)** 1:250 @ A1
As indicated @A1 1:500 @ A3

AU ARCHITECTURE URBANEIA WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019



BLDG G					BLDG F					BLDG E					BLDG D					BLDG C					BLDG B					BLDG A					TOTAL AMALGAMATED SITE				
NO.29-31					NO.21-27					NO.15-19					NO.11-13A					NO.3- 9 WALTER ST					NO.452-460 WILLOUGHBY RD & NO.1-1A WALTER ST					NO.462 WILLOUGHBY RD					NO.452-462 WILLOUGHBY RD & NO.1-31 WALTER ST				
	1 BED	2BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA		1 BED	2 BED	3 BED	GFA
GF	1	2		239	GF	0	3		278	GF	3	1		275	GF	0	4	2	632	GF	2	4	1	573	GF	2	4	1	589	GF	0	3	1	373		8	21	5	2959
LV1	3	3		434	LV1	2	5		564	LV1	2	5		563	LV1	4	2	2	643	LV1	3	5	0	612	LV1	3	5	0	612	LV1	0	3	1	432		17	28	3	3850
LV2	3	3		431	LV2	2	5		584	LV2	2	5		581	LV2	4	2	2	645	LV2	3	5	0	612	LV2	3	5	0	612	LV2	0	3	1	432		17	28	3	3857
LV3	0	3		264	LV3	0	4	1	447	LV3	0	4	1	451	LV3	0	6	0	528	LV3	1	3	1	440	LV3	0	0	3	420	LV3	0	2	1	289		1	22	7	2839
LV4	0	3		247	LV4	0	5	0	428	LV4	0	5	0	428	LV4	1	5	0	483	LV4	1	3	1	417	LV4	0	0	2	226							2	21	3	2225
LV5	0	3		247	LV5	0	5	0	431	LV5	0	5	0	426	LV5	1	5	0	483	LV5	1	3	1	417												2	21	1	2004
LV6	0	3		247	LV6	0	4	1	441	LV6	0	5	0	426	LV6	1	5	0	483	LV6	1	3	1	417												2	20	2	2014
LV7	0	3		247	LV7	0	4	1	441	LV7	0	5	0	426	LV7	0	0	3	350	LV7	0	0	2	220												0	12	6	1684
LV8			1	106	LV8		0	1	184	LV8		0	1	134																					0	0	3	424
TOTAL	7	23	1	2462	TOTAL	4	35	4	3776	TOTAL	7	35	2	3678	TOTAL	11	29	9	4247	TOTAL	12	26	7	3708	TOTAL	8	14	6	2459	TOTAL	0	11	4	1526	TOTAL	49	173	33	21856
	23%	74%	3%			9%	81%	9%			16%	80%	5%			22%	59%	18%			27%	58%	16%			29%	50%	21%			0%	73%	27%			19%	68%	13%	
TOTAL UNIT			31		TOTAL UNIT			43		TOTAL UNIT			44		TOTAL UNIT			49		TOTAL UNIT			45		TOTAL UNIT			28		TOTAL UNIT			15		TOTAL UNIT			255	
CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED	CAR PARKING			MIN.	PROPOSED
			39	39				55	57				56	57				64	64				58	58				37	37				20	20				330	332
SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing		SITE AREA	1.5 FSR	4%	affordable housing	
1641	2462	98			2513	3770	151			2456	3684	147			1946	2919	117			2084	3127	125			2248	3372	135			1682	2523	101			14570	21856	874	
TOTAL GFA				2462	TOTAL GFA				3776	TOTAL GFA				3678	TOTAL GFA				4247	TOTAL GFA				3708	TOTAL GFA				2459	TOTAL GFA				1526	TOTAL GFA				21856
FSR (Include 4%)				1.50	FSR (Include 4%)				1.50	FSR (Include 4%)				1.50	FSR (Include 4%)				2.18	FSR (Include 4%)				1.78	FSR (Include 4%)				1.09	FSR (Include 4%)				0.91	FSR (Include 4%)				1.50
SITE COVERAGE				29.6%	SITE COVERAGE				24.2%	SITE COVERAGE				25.0%	SITE COVERAGE				36.2%	SITE COVERAGE				31.8%	SITE COVERAGE				29.4%	SITE COVERAGE				24.8%	SITE COVERAGE				28.4%
DEEP SOIL				44.0%	DEEP SOIL				54.8%	DEEP SOIL				54.5%	DEEP SOIL				38.4%	DEEP SOIL				38.4%	DEEP SOIL				38.4%	DEEP SOIL				38.4%	DEEP SOIL				45.2%
SOLAR ACCESS				80.0%	SOLAR ACCESS				74.4%	SOLAR ACCESS				72.7%	SOLAR ACCESS				83.3%	SOLAR ACCESS				68.9%	SOLAR ACCESS				92.8%	SOLAR ACCESS				100.0%	SOLAR ACCESS				80.8%
CROSS VENTILATION				86.7%	CROSS VENTILATION				90.0%	CROSS VENTILATION				91.0%	CROSS VENTILATION				75.0%	CROSS VENTILATION				73.3%	CROSS VENTILATION				64.3%	CROSS VENTILATION				73.3%	CROSS VENTILATION				80.8%

SITE 3: BLDG G
SITE AREA : 1641m²
PROPOSED GFA: 2,462m²
PROPOSED FSR: 1.5 : 1

TOTAL UNITS: 31
1 BED: 7 (13%)
2 BED: 23 (80%)
3 BED: 1 (7%)

SITE COVERAGE: 29.6%
DEEP SOIL AREA: 44%

2HRS SOLAR ACCESS: 80%
SOUTH FACING UNITS: 0%
CROSS VENTILATION: 86.7%
PROPOSED CAR SPACE: 39

SITE 2: BLDG E+F
SITE AREA : 4969 m² (Including 66m² Easement)
PROPOSED GFA: 7,554m²
PROPOSED FSR: 1.5 : 1

TOTAL UNITS: 87
1 BED: 11 (13%)
2 BED:70 (80%)
3 BED: 6 (7%)

SITE COVERAGE: 24.6%
DEEP SOIL AREA: 54.6%

2HRS SOLAR ACCESS: 73.6%
SOUTH FACING UNITS: 9.2%
CROSS VENTILATION: 90%
PROPOSED CAR SPACE : 114

SITE 1: BLDG A+B+C+D
SITE AREA : 7,960.4m²
PROPOSED GFA: 11,940m²
PROPOSED FSR: 1.5 : 1

TOTAL UNITS: 137
1 BED: 31 (23%)
2 BED: 80 (58%)
3 BED: 26 (19%)

SITE COVERAGE: 30.5%
DEEP SOIL AREA: 38.4%

2HRS SOLAR ACCESS : 86.1%
SOUTH FACING UNITS: 8%
CROSS VENTILATION : 73.7%
PROPOSED CAR SPACE: 179

A.200 1 : 300

SCHEDULE @A1

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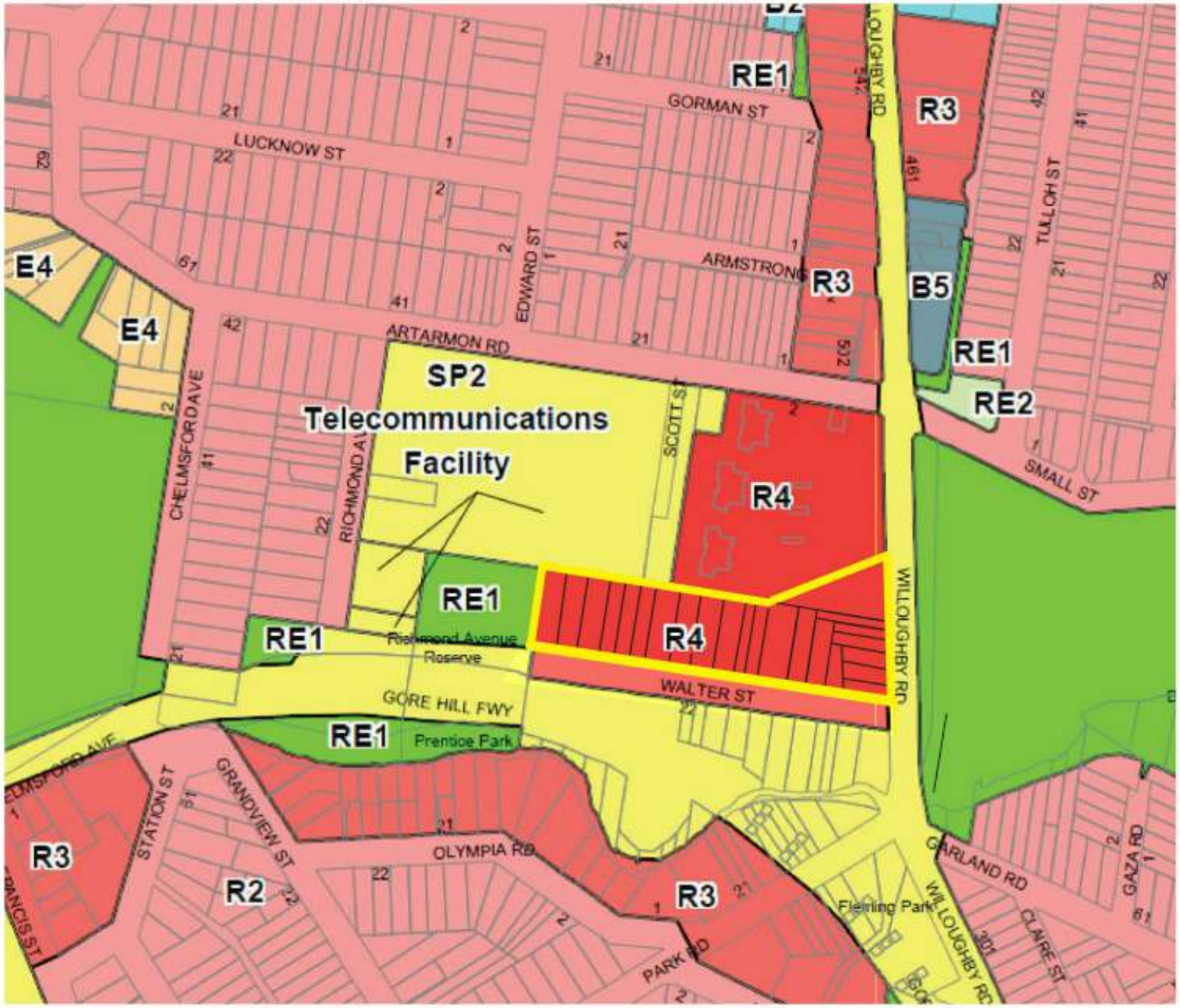
WALTER STREET MASTER PLAN ISSUE A PLANNING PROPOSAL ISSUE 30/08/2019



Land Zoning Map - Sheet LZN_004

Zone

- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- B4 Mixed Use
- B5 Business Development
- B7 Business Park
- E1 National Parks and Nature Reserves
- E2 Environmental Conservation
- E4 Environmental Living
- IN1 General Industrial
- IN2 Light Industrial
- R2 Low Density Residential
- R3 Medium Density Residential
- R4 High Density Residential
- RE1 Public Recreation
- RE2 Private Recreation
- SP1 Special Activities
- SP2 Infrastructure
- SITE

PROPOSED ZONING - HIGH DENSITY RESIDENTIAL

APP 401 PROPOSED AMENDED LEP EXTRACT MAPS- LAND ZONING

@A1

WILLOUGHBY CITY COUNCIL
City of Diversity

PLANNING & INFRASTRUCTURE
Planning Unit

23 March 2017

Notice of Determination of a Development Application

Issued under the Environmental Planning and Assessment Act 1979 Section 81(1)(a)

Development Consent DA-2016/303 (D)

Description of Land: **11, 11A, 13 & 13A WALTER STREET, WILLOUGHBY NSW 2068 LOT 2 DP 590018, LOT 1 DP 590018, LOT 362 DP 1032203, LOT 361 DP 1032203**

Willoughby City Council, pursuant to Section 80(1)(a) of the Act, hereby **CONSENTS** to the abovementioned land being used for the following purposes, **subject to compliance** with the Conditions set out in the attached Schedule.

Description of Proposal: Demolition of structures and construction of a four storey residential flat building, carparking, landscaping and associated works.

Consent to operate from: 23.03.2017 Consent to lapse on: 24.03.2022

It should be clearly understood that this Consent in no way relieves the owner or applicant from the obligation to obtain any other approval which may be required under the Local Government Act or any other Act. In particular this Consent is not an approval to carry out any building works whatsoever, such requiring the prior issue of a Construction Certificate which can be obtained from Council.

Debra Just
GENERAL MANAGER
per:

NOTES:

(1) To ascertain the date upon which the consent becomes effective refer to Section 83 of the Act.
(2) To ascertain the extent to which the consent is liable to lapse refer to Section 95 of the Act.
(3) Section 82A of the Act confers on an applicant the right to request a review of the Council's determination or conditions attached to the consent within a period of six months (6) from the date of determination.
(4) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within six months (6) after receipt of this notice.
(5) Section 125 of the Act confers the authority to direct any person to comply with the terms and conditions of any Consent and any person failing to comply with such a direction shall be guilty of an offence under the Act.
(6) Section 127A of the Act confers the authority to issue Penalty Notices for certain offences. The penalty for development not carried out in accordance with consent: - Class 1 & 10 buildings is $1500 for an Individual & $3000 for a Corporation - Other building class is $3000 for an Individual & $6000 for a Corporation

Reference: DA-2016/303
Enquiries: Chi Wai Kong
Phone: 02 9777 1064

Availability: Available 8.30 -10 am, otherwise by appointment

Willoughby City Council | 31 Victor Street, Chatswood NSW 2067 | P (02) 9777 1000
PO Box 57, Chatswood NSW 2057 | F (02) 9777 1038 | E email@willoughby.nsw.gov.au
www.willoughby.nsw.gov.au | ABN 47 974 826 099

SCHEDULE

Conditions of Consent: (Including reasons for such conditions)

CONSENT IDENTIFICATION

The following condition provides information on what forms part of the Consent.

1. Approved Plan/Details

The development must be in accordance with the following consent plans electronically stamped by Council:

Type	Plan No.	Revision/ Issue No	Plan Date (as Amended)	Prepared by
Site analysis	A003	E	18/01/17	Architecture Urbaneia
Demolition & waste management plan	A005	C	12/8/16	
Basement	A099	P	18/01/17	
G/F	A100	O		
Level 1	A101	L		
Level 2	A102	L		
Level 3	A103	M		
Roof plan	A104	L		
North elevation	A150	J		
South elevation	A151	K		
East elevation	A152	J		
West elevation	A153	K		
Cross section	A160	L		
Long section 01	A161	K		
Long section 02	A161b	D		
Adaptable units	A204, A206, A207	E	12/01/17	
Adaptable units	A205	A	12/01/17	
Stormwater management plan	SW01 to SW04	C	19.01.2017	
Erosion & sediment control plan	ESCP01	A	12.08.2016	

Landscape plans	2325 LP-01 to 2325 LP-04	D	12/08/2016	John Lock & Associates Landscape Architecture

the application form and any other supporting documentation submitted as part of the application, except for:

a) any modifications which are "Exempt Development" as defined under S76(2) of the Environmental Planning and Assessment Act 1979;

b) otherwise provided by the conditions of this consent.
(Reason: Information and ensure compliance)

PRIOR TO ISSUE OF CONSTRUCTION CERTIFICATE

The following conditions of consent must be complied with prior to the issue of a construction certificate.

2. Amendments

Prior to the issue of the Construction Certificate, the proposal is to be amended in the following manner:

(a) The storage area allocated to individual units in the basement car park should be provided in accordance with Part 4G of SEPP 65 – Design Quality of Residential Apartment Development and be shown on the plans.

Plans detailing these amendments are required to be shown on the Construction Certificate plans.

(Reason: Ensure compliance)

3. Section 94A Contributions

Prior to the issue of the Construction Certificate, a monetary contribution of $69,791.28 (subject to indexing as outlined below) is to be paid in accordance with Section 94A of the Environmental Planning and Assessment Act, 1979.

This contribution is based on 1% of the estimated development cost of $6,979,128 at 12 August 2016 and the adopted Section 94A Contributions Plan.

To calculate the monetary contribution that is payable, the proposed cost of development is to be indexed to reflect quantity variations in the Building Price Index (Enterprise Bargaining Agreement) [BPI(EBA)] between the date the proposed cost of development was agreed by the Council and the date the levy is to be paid as required by this Plan.

To calculate the indexed levy, the formula used to determine the cash contribution is set out below.

$$NL = \$Lo + \$Lo \times \frac{[\text{current index} - \text{base index}]}{\text{base index}}$$

Where:

NL	is the new section 94A levy
Lo	is the original levy
Current index [BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works available at the time of review of the contribution rate
Base index [BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works at the date of the proposed cost of development as above

In the event that the current BPI(EBA) is less than the previous BPI(EBA), the current BPI(EBA) shall be taken as not less than the previous BPI(EBA).

Prior to payment Council can provide the value of the indexed levy.

Copies of the S94A Contributions Plan are available for inspection online at www.willoughby.nsw.gov.au
(Reason: Statutory requirement)

4. Services - Energy Australia

The applicant should consult with Energy Australia to determine the need and location of any electrical enclosure for the development. Should such an electrical enclosure be required, the location and dimensions of the structure are to be detailed on all the plans issued with the Construction Certificate. In the event of Energy Australia requiring such a structure eg. a substation, the applicant is required to dedicate the land for the substation as public roadway. The Plan of Dedication shall be lodged to Council prior to issue of the Construction Certificate and registered at the Department of Lands prior to issue of the Occupation Certificate.
(Reason: Compliance)

5. Roof Material – Reflectivity

The external finish to the roof shall be painted or treated in a neutral, recessive non reflective colour range to minimise the effects of glare to neighbouring properties. Roof colour details being submitted with the construction certificate application for approval.
(Reason: Amenity)

6. Sydney Water 'Tap In'

Prior to the issue of the Construction Certificate, the approved plans must be submitted online to "Sydney Water Tap In" to determine whether the development will affect Sydney Water's sewer and water mains and to see if further requirements need to be met.

An approval receipt will need to be obtained prior to release of the Construction Certificate.
(Reason: Ensure compliance)

7. Adaptable Units

Adaptable residential units for disabled persons are to be provided consistent with the approved plans (Total 11 units). Three (3) disabled car spaces are to be nominated on the Construction Certificate drawings and be allocated to the adaptable units as required under the Willoughby Development Control Plan Part C.6 – Access, Mobility and Adaptability.
(Reason: Amenity)

8. Agreement to Transfer Affordable Housing Dwellings

The applicant must enter into a Deed with the Council providing for the transfer of title of the affordable housing dwelling (identified as Unit 114 on the approved plans with a gross floor area of 76m^2) to the Council, free of charge. The Deed is to be generally in accordance with the Housing Transfer Deed template available at Council and is to be submitted to the Council and executed prior to the issue of the Construction Certificate.

The terms of this agreement must be to the satisfaction of the Council and must include a provision to the effect that the transfer of the dwellings is to be completed within two months of the registration of any subdivision of the development creating the areas to be dedicated and within 6 months of the issue of an Occupation Certificate. The applicant must agree to pay the Council's reasonable legal costs in satisfying itself that the agreement is appropriate, and a provision to this effect is to be included in the agreement.

The construction certificate plans should demonstrate that the physical requirements specified in the Housing Transfer Deed are satisfied.

(Reason: Ensure compliance)

9. Affordable Housing Fittings and Finishes

Prior to the issue of the Construction Certificate, the applicant is to submit to the Council details of all internal fittings and finishes of the affordable housing dwellings. The applicant is responsible for obtaining written confirmation from Council that it is satisfied that the internal fittings and finishes are at the same standard as other dwellings within the development.
(Reason: Amenity)

10. Damage Deposit

Prior to the issue of the Construction Certificate, the applicant shall lodge a Damage Deposit of $40,000 (GST Exempt) as cash, cheque or an unconditional bank guarantee, to Council against possible damage to Council's asset during the course of the building works. The deposit will be refundable subject to inspection by Council after the completion of all works relating to the proposed development. For the purpose of inspections carried out by Council Engineers, an inspection fee of $300 (GST Exempt) is payable to Council. Any damages identified by Council shall be restored by the applicant prior to release of the Damage Deposit.
(Reason: Protection of public asset)

11. Stormwater Conveyed to Street Drainage

Stormwater runoff from the site shall be collected and conveyed to the street drainage system in accordance with Council's specifications. Any new drainage pipe connections to street kerb shall be made using a 125mm x 75mm x 4mm thick galvanised Rectangular Hollow Section (RHS) with a grated drainage pit (min. 600mm x 600mm) provided within the property and adjacent to the boundary prior to discharging to the Council's drainage system. All drainage works shall comply with the requirements described in Part C.5 of Council's DCP and Technical Standards. In this regard, full design and construction details showing the method of disposal of surface and roof water from the site shall be shown on the Construction Certificate plans.
(Reason: Stormwater control)

12. Detailed Stormwater Management Plan (SWMP)

Submit for approval by the Certifying Authority, detailed stormwater management plans in relation to the on-site stormwater management and disposal system for the development. The construction drawings and specifications shall be prepared by a suitably qualified and experienced civil engineer and in accordance with the stormwater management plans. All drawings shall comply with Part C.5 of Council's Development Control Plan and Technical Standards, AS3500.3 – *Plumbing and Drainage Code* and National Construction Code.
(Reason: Ensure compliance)

13. Basement Pumpout Drainage System

Prior to the issue of the Construction Certificate, the applicant shall submit, for approval by the Certifying Authority, detailed stormwater management plans in relation to the pump-out drainage system. The construction drawings and specifications, shall be generally in accordance with the approved stormwater management plans with the following requirements:

- The pumpout drainage system shall comprise with two (2) submersible type pumps. The two pumps shall be designed to work on an alternative basis to ensure both pumps receive equal use and neither remains continuously idle.
- Each pump shall have a minimum capacity of 10L/s or shall be based on the flow rate generated from the 1 in 100 year ARI 5-minutes duration storm event of the area draining into the system, whichever is greater.
- An alarm warning device (including signage and flashing strobe light) shall be provided for the pump-out system to advise the occupant of pump failure. The location of the signage and flashing strobe light shall be shown on the stormwater management plans.
- The volume of the pump-out tank shall be designed with a minimum storage capacity equivalent to the runoff volume generated from of the area draining into the tank for the 1 in 100 year ARI 2-hours duration storm event.

All drawings shall be prepared by a suitably qualified and experienced civil engineer and shall comply with Part C.5 of Council's Development Control Plan, AS3500.3 – *Plumbing and Drainage Code* and the National Construction Code.
(Reason: Prevent nuisance flooding)

14. Construction Management Plan (CMP)

Prior to the issue of the Construction Certificate, submit, for approval by the Certifying Authority, detailed Construction Management Plan (CMP). The CMP shall address:

(a) Construction vehicles access to and egress from the site
(b) Parking for construction vehicles
(c) Locations of site office, accommodation and the storage of major materials related to the project
(d) Protection of adjoining properties, pedestrians, vehicles and public assets
(e) Location and extent of proposed builder's hoarding and Work Zones
(f) Tree protection management measures for all protected and retained trees.

(Reason: Compliance)

15. Design of Works in Public Road (Roads Act Approval)

Prior to issue of any Construction Certificate, the Applicant must submit, for approval by Council as a road authority, full design engineering plans and specifications prepared by a suitably qualified and experienced civil engineer for the following infrastructure works:

- Construction of 1.2 metres footpath (max. 2.5% crossfall) for the full frontage of the site in Walter Street. All Adjustments to public utility services and associated construction works in the nature strip are to be at the full cost to the applicant. Detailed long section and cross sections at 5 metres interval shall be provided.
- Construction of new kerb and gutter for the full frontage of the development site in Walter Street with 5 metres wide road restoration. Detailed long sections and cross-section at 5m interval shall be provided.
- Construction of 5.5 new vehicular crossings in Walter Street. The design levels at the property boundary shall be in accordance with the driveway long sections.

The required plans must be designed in accordance with Council's specifications (AUS-SPEC). A minimum of three (3) weeks will be required for Council to assess the *Roads Act* submissions. Early submission is recommended to avoid delays in obtaining a Construction Certificate. For the purpose of inspections carried out by Council Engineers, the corresponding fees set out in Council's current *Fees and Charges Schedule* are payable to Council prior to issue of the approved plans. Approval must be obtained from Willoughby City Council as the road authority under the Roads Act 1993 for any proposed works in the public road prior to the issue of any Construction Certificate.
(Reason: Ensure compliance)

16. Splay Corner for Fence

In order to ensure adequate sight distances for pedestrians and traffic in the frontage road, the boundary fence shall be designed and constructed by either a 2m x 2.5m splay on both sides of the driveway exit. Details demonstrating compliance are to be submitted with the construction certificate application.
(Reason: Pedestrian safety)

17. Vehicle Access – Engineer's Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on the architectural drawings and the structural drawings, and must make specific reference to the following:

a) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.

a) That a maximum gradient of 5% is provided for the first 6 metres from the property boundary to the basement.

b) That the proposed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,

c) That the headroom clearance of minimum 2.2 metres between the basement floor and any overhead obstruction is provided which complies with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.

d) That the headroom clearance of minimum 2.5 metres is provided to all parking spaces for people with disabilities which complies with Section 2.4 of AS2890.6.

e) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

18. Geotechnical Report

Submit to the accredited certifier a geotechnical engineer's report of the proposed geotechnical works including excavation, piling, and shoring. The report shall specifically address safety issues. A report from the Geotechnical Engineer shall be submitted to Council for record purposes.
(Reason: Safety & Amenity)

19. Tree Protection Plan

i) Submit to the accredited certifier a Tree Protection Plan drawing for approval prior to issue of a construction certificate.

ii) The tree Protection Plan is to be prepared by a qualified Arborist with minimum qualification AQF Level 5.

iii) Tree Protection Plan drawing shall address tree protection and management of all trees to be retained (including those on adjoining properties) in accordance with AS 4970-2009 'Protection of trees on development sites' and clearly mark tree protection zones as well as tree protection measures and fencing.

(Reason: Tree protection)

20. Internal Noise Levels Residential

To minimise the noise intrusion from any external noise source, the building shall be designed and constructed to comply with the following criteria with windows and doors closed:

Internal Space	Time Period	Criteria $L_{Aeq\ (period)}$
Living Areas	Any time	40 dB(A)
Sleeping Areas	Day (7am – 10pm)	40 dB(A)
	Night (10pm – 7am)	35 dB(A)

Note:

1. The above criteria does not apply to kitchens, bathrooms, laundries, foyers, hallways, balconies or outdoor areas.
2. The above criteria define the minimum acceptable levels. Buildings may be built to a better than average standard by applying more stringent criteria.

Certification from an appropriately qualified acoustic consultant that the building has been designed to meet this criteria shall be submitted to the Certifying Authority prior to issue of the Construction Certificate.
(Reason: Amenity, environmental compliance and health)

21. Building Ventilation

To ensure that adequate provision is made for ventilation of the building, mechanical and/or natural ventilation shall be provided. These shall be designed in accordance with the provisions of:

a) The National Construction Code:
   i) AS1668.1, AS1668.2 and AS3666.1 as applicable; and/or
   ii) Alterative solution using an appropriate assessment method

Details of all mechanical ventilation and exhaust systems, and certification provided by an appropriately qualified person verifying compliance with these requirements, shall be submitted to the Certifying Authority prior to the issue of the Construction Certificate.
(Reason: Health and compliance)

22. Hazardous Building Material Assessment

A hazardous building material assessment shall be undertaken by an appropriate qualified person and is to be submitted to the Certifying Authority for approval prior to the issue of the Construction Certificate. The assessment shall identify any likely hazardous materials within any structure to be demolished and provide procedures on how to handle and dispose of such materials.
(Reason: Environmental protection/public health and safety)

23. Noise Mechanical Services

To minimise the impact of noise onto residential receivers, all mechanical services shall be designed and installed to ensure ambient noise levels are maintained.

Details of the proposed equipment, siting and any attenuation required shall accompany the application for Construction Certificate.
(Reason: Amenity, environmental compliance and health)

PRIOR TO COMMENCEMENT

The following conditions of consent have been imposed to ensure that the administration and amenities relating to the proposed development comply with all relevant requirements. All of these conditions are to be complied with prior to the commencement of any works on site.

24. Licensee Details

The name, address and contractor licence number of the licensee who has contracted to carry out the work or the name and permit number of the owner-builder who intends to carry out the work shall be furnished in writing to the Certifying Authority prior to commencement of work.
NB: Should changes be made for the carrying out of the work the Certifying Authority must be immediately informed.
(Reason: Information)

25. Building Site Hoarding

Prior to the commencement of work, a hoarding, complying with StateCover NSW requirements which is to be erected to restrict public access to the site (including demolition and/or excavation site), building works, materials or equipment. A separate application is to be made to Council's Infrastructure Services Division for this purpose should the hoarding be located on Council property.
(Reason: Safety)

26. Site Management

A site Management Plan shall be submitted to and approved by the Certifying Authority prior to commencement of work. The site management plan shall include the following measures as applicable.

- Details and contact telephone numbers of the owner, builder and developer;
- Location and construction details of protective fencing to the perimeter of the site;
- Location of site storage areas, sheds and equipment;
- Location of stored building materials for construction;
- Provisions for public safety;
- Dust control measures;
- Site access location and construction;
- Details of methods of disposal of demolition materials;
- Protective measurers for tree preservation;
- Provisions for temporary sanitary facilities;
- Location and size of waste containers and bulk bins;
- Soil and Water Management Plans (SWMP); comprising a site plan indicating the slope of land, access controls, location and type of sediment controls and storage/control methods for material stockpiles;
- Construction noise and vibration management.

The site management measures shall be implemented prior to the commencement of any site works and maintained during the construction period. A copy of the approved Site Management Plan shall be conspicuously displayed, maintained on site and be made available to the Certifying Authority/Council officers upon request.

(Reason: Environment protection, public health and safety)

27. Dilapidation Report of Adjoining Properties

Prior to commencement of work, submit a photographic survey and report of the adjoining properties Nos 9 and 15 Walter Street, Willoughby to the Certifying Authority and all owners of these adjoining properties. Such photographic survey and report shall be prepared by a suitably qualified person, detailing the physical condition of these properties, both internal and external including items as walls, ceilings, roof, structural members and other items as necessary.

In the event of a property owner refusing to allow access to carry out the photographic survey, the proponent must demonstrate in writing to the Certifying Authority, and provide a copy to Council, that the purpose of the survey was made clear to the property owner and that reasonable attempts to obtain access were made.
(Reason: Protection of adjoining owners)

28. Dilapidation Report of Council's Property

Submit a dilapidation report including photographic record of Council's property extending to a distance of 50m from the development, detailing the physical condition of items such as, but not exclusively to, the footpath, roadway, nature strip, and any retaining walls.

The developer may be held liable to any recent damage to public infrastructure in the vicinity of the site, where such damage is not accurately recorded under the requirements of this condition prior to the commencement of works. In this regard, the damage deposit lodged by the applicant may be used by Council to repair such damage on Council's property.

This dilapidation report shall be submitted to Council and the Certifying Authority prior to commencement of work.
(Reason: Protection of Council's infrastructure)

29. Permits and Approvals Required

Application is to be made to Council's Infrastructure Services Division for the following approvals and permits as appropriate:-

a) Permit to erect Builder's hoarding where buildings are to be erected or demolished within 3.50m of the street alignment. Applications are to include current fees and are to be received at least 21 days before commencement of the construction.

b) Permit to stand mobile cranes and/or other major plant on public roads. Applications are to include current fees and security deposits and are to be received at least seven days before the proposed use. It should be noted that the issue of such permits may also involve approval from the NSW Police Force and the RTA. A separate written application to work outside normal

hours must be submitted for approval.

It should also be noted that, in some cases, the above Permits may be refused and temporary road closures required instead which may lead to longer delays due to statutory advertisement requirements.

c) Permit to open public roads, including footpaths, nature strip, vehicular crossing or for any purpose whatsoever. All applications are to include current fees.

d) Permit to place skip/waste bin on footpath and/or nature strip. (Maximum three (3) days).

e) Permit to work and/or place building materials on footpath and/or nature strip. (Maximum two (2) weeks).

f) Permit to establish Works Zone on Public Roads adjacent to the Development including use of footpath area. Applications must be received by Council at least twenty-one days prior to the zone being required. The application will then be referred to the Council's Local Traffic Committee for approval, which may include special conditions.

g) Permit to construct vehicular crossings over Council's footpath, road or nature strip.

(Reason: Legal requirements)

30. Application for Vehicle crossing

Submit an application with fees to Council for the construction of a plain concrete vehicular crossing.
(Reason: Protection of public asset)

31. Garbage Rooms

Garbage rooms must be large enough to store the generated waste from the proposed uses and allowance should be made for separation of putrescible waste from waste suitable for recycling. The garbage room is not to be smaller than 5000mm x 4000mm, have a 2400mm ceiling height, with a door entry width not less than 2200mm.
(Reason: Ensure compliance)

DURING DEMOLITION, EXCAVATION AND CONSTRUCTION

The following conditions are to be complied with throughout the course of site works including demolition, excavation and construction.

32. Hours of Work

All construction/demolition work relating to this Development Consent within the City, unless varied by an Out of Hours Work Permit, must be carried out only between the hours of 7 am to 5 pm Mondays to Fridays and 7 am to 12 noon on Saturdays. No work is permitted on Sundays or Public Holidays.

An application for an Out of Hours Work Permit to allow variation to these approved hours must be lodged with Council at least 48 hours prior to the proposed commencement of the work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and must be accompanied by the required fee. One (1) permit is required for each variation to the approved working hours within any 24 hour period.

If a variation to these approved hours for multiple or extended periods is sought, an application under Section 96 of the Environmental Planning and Assessment Act 1979 must be lodged with Council at least twenty-one (21) days in advance of the proposed changes to the hours of work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and be accompanied by the required fee. Note: This S96 application may require re-notification in some circumstances.
(Reason: Ensure compliance and amenity)

33. Construction Information Sign

A clearly visible all weather sign is required to be erected in a prominent position on the site detailing:

(a) that unauthorised entry to the work site is prohibited;
(b) the excavator's and / or the demolisher's and / or the builder's name;
(c) contact phone number/after hours emergency number;
(d) licence number;
(e) approved hours of site work; and
(f) name, address and contact phone number of the Certifying Authority (if other than Council)

ANY SUCH SIGN IS TO BE REMOVED WHEN THE WORK HAS BEEN COMPLETED.

Council may allow exceptions where normal use of the building/s concerned will continue with ongoing occupation, or the works approved are contained wholly within the building.
(Reason: Ensure compliance)

34. Building Site Fencing

Public access to the site and building works, materials and equipment on the site is to be restricted, when work is not in progress or the site is unoccupied.

A temporary safety fence is to be provided to protect the public, located to the perimeter of the site (unless the site is separated from the adjoining land by an existing structurally adequate fence, having a minimum height of 1.5m). Temporary fences are to have a minimum height of 1.8m and be constructed of cyclone wire or similar with fabric attached to the inside of the fence to provide dust control.

Fences are to be structurally adequate and be constructed in a good and workmanlike manner and the use of poor quality materials or steel reinforcement mesh as fencing is not permissible. All parts of the fence, including the fencing blocks shall be located wholly within the property boundaries.

The public safety provisions and temporary fences must be in place and be maintained throughout construction.
(Reason: Safety)

35. Provide Erosion and Sediment Control

Erosion and sediment control devices shall be provided wholly within the site whilst work is being carried out in order to prevent sediment and silt from site works (including demolition and/or excavation) being conveyed by stormwater into Council's stormwater system natural watercourses, bushland and neighbouring properties. In this regard, all stormwater discharge from the site shall meet the requirements of the Protection of Environment Operations Act 1997 and the Department of Environment, Climate Change and Water guidelines. The control devices are to be maintained in a serviceable condition AT ALL TIMES.
(Reason: Environmental protection)

36. Suitable Screens

Suitable screens and/or barricades shall be erected during demolition and building work and where required by the Certifying Authority to reduce the emission of noise, dust, water effluent or other matter from the site.
(Reason: Maintain amenity to adjoining properties)

37. Suitable Barricades

Suitable barricades shall be erected during building works on Councils footpath and where directed by the Certifying Authority and/or Council to protect pedestrians using the footpath.
(Reason: Public safety)

38. Demolition Work AS 2601-2001

Any demolition must be carried out in accordance with AS 2601 – 2001, *The demolition of structures.*
(Reason: Safety)

39. Suitable Footpath Crossing Provided

Adequate provision is to be made to ensure that a suitable footpath crossing is provided to the site so as to allow safe pedestrian access along the footpath area at all times.
(Reason: Protection of public safety)

40. Wash Down and Shaker Areas

During Demolition, Excavation and Construction, wash down and shaker areas are to be provided with facilities for the collection and treatment of waste water.
(Reason: Environmental protection)

41. Asbestos Sign to be Erected

On sites involving demolition or alterations and additions to building where asbestos cement is being repaired, removed or disposed of a standard commercially manufactured sign not less than 400mm x 300mm containing the words "DANGER ASBESTOS REMOVAL IN PROGRESS" is to be erected in a prominent visible

position on the site. The sign is to be erected prior to the commencement of works and is to remain in place until such time as all asbestos cement has been removed from the site to an approved waste facility.
(Reason: Public Health and safety/Ensure compliance)

42. Neighbour Notification of Asbestos Removal

The applicant/builder is to notify the adjoining residents five working days prior to demolition works involving removal of asbestos. Such notification is to be clearly written, giving the date work will commence, Work Cover NSW phone number 131 050, Councils phone number 9777 1000.

This notification is to be placed in the letterbox of every property (including every residential flat or unit) either side and immediately at the rear of the site.

(Reason: Public health)

43. Asbestos Removal

Works involving the removal of asbestos must comply with Councils Policy on handling and disposal of asbestos, and must also comply with the Code of Practice for Safe Removal of Asbestos (National Occupational Health and Safety Commission 2012 (1994).

Demolition is to be carried out in accordance with the applicable provisions of Australian Standard AS 2601 – The Demolition of Structures.
(Reason: Public health and safety/Ensure compliance)

44. Asbestos Disposal

All asbestos laden waste, including bonded or friable asbestos must be disposed of at a waste disposal site approved by the NSW Department of Environment, Climate Change and Water.

Upon completion of the asbestos removal and disposal the applicant must furnish the Certifying Authority with a copy of all receipts issued by the waste disposal site as evidence of proper disposal.
(Reason: Environmental protection/Public health and safety)

45. Survey Certificate

Certification of the following shall be submitted to the Certifying Authority by a registered surveyor:

a) Prior to the construction of footings or first completed floor slab (i.e. prior to pouring of concrete) showing the area of the land, building under construction and boundary setbacks;

b) At each level indicating the level of that floor to Australian Height Datum;

c) Upon completion of the roof framing, before the roofing is laid, indicating the ridge height to Australian Height Datum;

d) At roof slab level indicating the level of that slab to Australian Height Datum;

e) At completion indicating the relation of the building and any projections to the boundaries, and that the building has been erected to the levels approved in

the Development Application.

(Reason: Ensure compliance)

46. Road and Footpath

Council's footpath, nature strip or roadway not being damaged and shall be kept clear at all times.
(Reason: Maintain public safety)

47. No Storage on Foot/Roadway

Building materials, plant and equipment and builder's waste, are not to be placed or stored at any time on Council's footpath, nature strip or roadway adjacent to building sites unless prior written approval has been granted by Council.
(Reason: Safety)

48. Skips and Bins

Rubbish skips or bins are not to be placed on Council's footpath, nature strip or roadway unless prior written approval has been granted by Council.
(Reason: Safety)

49. Excavations and Backfilling

All excavations and backfilling associated with the erection or demolition of a building must be executed safely, and must be properly guarded and protected to prevent them from being dangerous to life or property.
(Reason: Safety)

50. Excess or Waste Concrete

Excess or waste concrete from mobile concrete agitators or concrete pumping equipment shall not be washed down, spilled or disposed of onto the road reserve, Council's stormwater system, road, pavement, reserves or Council land.
(Reason: Environmental protection)

51. Temporary Toilet Facilities

Temporary toilet facilities shall be provided to the satisfaction of the Certifying Authority.

The provision of toilet facilities must be completed before any other work is commenced on site. NOTE: Portable toilet facilities are not permitted to be placed on public areas without prior approval having been obtained from Council.
(Reason: Health and amenity)

52. Sweep & Clean Pavement

Sweep and clean pavement surface adjacent to the ingress and egress points of earth, mud and other materials at all times and in particular at the end of each working day or as directed by Council.
(Reason: Legal requirement)

53. Street Signs

The applicant is responsible for the protection of all regulatory / parking / street signs fronting the property. Any damaged or missing street signs as a consequence of the development and associated construction works are to be replaced at full cost to the applicant.
(Reason: Protection of public assets)

54. Tree Protection

i) Retain and protect the following trees and vegetation throughout the demolition and construction period: All trees not indicated for removal on Landscape Plan Dwg No. LP-01 D dated 12/08/2016 prepared by John Lock & Associates Landscape Architecture

ii) The above trees must be clearly marked and protection devices in place to prevent soil compaction and machinery damage.

iii) Tree roots greater than 50mm diameter are not to be removed unless approved by a qualified arborist on site. All structures are to bridge roots unless directed by a qualified arborist on site.

iv) Tree protection measures must comply with the approved Tree Protection Plan and AS 4970-2009 Protection of trees on development sites.

(Reason: Tree management)

55. Public Tree Protection

Unless identified by the development consent, no tree roots over 50mm diameter are to be damaged or cut and all structures are to be bridged over such roots.

Should any problems arise with regard to the existing or proposed trees on public land during the construction or bond period, the applicant is to immediately Contact Council's Open Space section and resolve the matter to Council's satisfaction.
(Reason: Tree management)

56. Storage of Materials on Council Land Prohibited

The dumping or storage of building materials, spoil, vegetation, green waste, or any other material in the Council reserve is prohibited.
(Reason: Safety, environmental protection)

57. Waste Classification – Excavation Materials

All materials excavated and removed from the site (fill or natural) shall be classified in accordance with the Environment Protection Authority (EPA) Waste Classification Guidelines prior to being disposed of to a NSW approved landfill or to a recipient site.
(Reason: Environment and health protection)

58. Hazardous Materials – Clearance Certificate

Following completion of the removal of any identified hazardous material associated with demolition works, a clearance certificate shall be issued by an appropriately

qualified occupational hygienist and submitted to the Certifying Authority. The clearance certificate shall verify that the site is free from any hazardous materials from the demolished buildings.
(Reason: Health and safety)

59. Unexpected Finds Protocol

An unexpected finds contingency plan should be incorporated into site redevelopment works. In the event that previously unidentified contaminated soils or materials are identified during site redevelopment, works should cease in the immediate vicinity and the affected area isolated to minimise disturbance. A suitably qualified contaminated site consultant should be engaged to assess the degree, type and extent of contamination and establish a suitable remediation plan. The Site Manager/landowner shall notify Council in writing when they become aware of any contamination.
(Reason: Environment & Health Protection)

60. Importation of Fill

Any material to be imported onto the site for levelling, construction or engineering purposes must satisfy the Office of Environment & Heritage (OEH) requirements for *virgin excavated natural material* (VENM), or *excavated natural material* (ENM). The determination of VENM or ENM must be made by suitable qualified consultant. Pre-certification of the imported material shall be made and details made available to Council upon request.
(Reason: Environment & Health Protection)

61. Dust Control

The following measures must be taken to control the emission of dust:

a) Dust screens must be erected around the perimeter of the site and be kept in good repair for the duration of the work.

b) Any existing accumulation of dust (e.g. in ceiling voids and wall cavities) must be removed using an industrial vacuum cleaner fitted with a high efficiency particulate air (HEPA) filter.

c) All dusty surfaces must be wet down and any dust created must be suppressed by means of a fine water spray. Water used for dust suppression must not be allowed to enter the street or stormwater system.

d) All stockpiles of materials that are likely to generate dust must be kept damp or covered.

e) Demolition work must not be carried out during high winds, which may cause dust to spread beyond the boundaries of the site.

(Reason: Amenity)

62. Construction Noise

Construction noise shall be controlled to comply with the requirements as set out in the EPA Interim Construction Noise Guideline. Noise levels shall not exceed the rated background level by more than 10dB(A) at the most sensitive receiver during the standard construction hours. A noise monitoring plan shall be implemented

during construction. Where noise levels may be exceeded appropriate measures to control excessive noise shall be implemented immediately.
(Reason: Amenity)

PRIOR TO OCCUPATION OF THE DEVELOPMENT

The following conditions of consent must be complied with prior to the issue of an occupation certificate.

63. Section 73 Compliance Certificate

A Section 73 Compliance Certificate under the Sydney Water Act 1994 must be obtained prior to the issue of a Final Occupation Certificate. Application must be made through an authorised Water Servicing Coordinator, for details see Customer Service, Urban Development at www.sydneywater.com.au or telephone 13 20 92.

The Section 73 Certificate must be submitted to the Certifying Authority.
(Reason: Ensure statutory compliance)

64. Street Numbering

Prior to the issue of any Occupation Certificate, written application shall be made to the Geospatial Services Section of Council for the allocation of street numbering for each of the newly created strata lots and/or allotments. Documentary evidence of the allocated numbering issued by Council is to be lodged with the Subdivision Certificate Application and Linen Plans.
(Reason: Ensure compliance with Council street numbering policy)

65. Fire Safety Certificate Forwarded to NSW Fire and Rescue

Prior to the issue of the Final Occupation Certificate and upon completion of the building work, a Fire Safety Certificate shall be furnished by the owner to Council, and the owner must cause a copy of the certificate (together with a copy of the current fire safety schedule) to be forwarded to the Commissioner of New South Wales Fire and Rescue, and must cause a further copy of the certificate (together with a copy of the current fire safety schedule) to be prominently displayed in the building in accordance with Clause 172 of the Environmental Planning and Assessment Regulation 2000 in respect to each essential fire safety measure included in the Schedule attached to the Construction Certificate.
(Reason: Safety)

66. Registration of Plan of Consolidation

Prior to the issue of any Occupation Certificate, all individual allotments involved in the development site shall be consolidated into a single allotment and evidence of the registration of the plan of consolidation to be submitted to Council.
(Reason: Ensure compliance)

67. Safer by Design

Prior to the issue of any Occupation Certificate and to minimise the opportunity for crime and in accordance with CPTED principles, the development shall incorporate the following:

i. In order to maintain a safe level of visibility for pedestrians within the development, adequate lighting to AS1158 is to be provided to all common areas including the basement car park, common open space and any common stair access to these areas and pedestrian routes, particularly including the waste storage areas.

This lighting shall ensure consistency to avoid contrasts between areas of shadow/illumination and preferably be solar powered and with an automatic/timed switching mechanism, motion sensor or equivalent for energy efficiency. Such lighting shall be installed and directed in such a manner so as to ensure that no nuisance is created for surrounding properties or to drivers on surrounding streets. Car parking lighting system is to be controlled by sensors to save energy during periods of no occupant usage.

ii. The ceiling and vertical structures of the basement parking area shall be painted white (or equivalent) in order to ensure good visibility, surveillance and less reliance on artificial lighting lux levels.

iii. The design, installation and maintenance of landscaping (and associated works) within pedestrian routes around the site (and adjacent to mailboxes) shall not impede visibility and clear sight lines along the pedestrian footway from one end to the other.

iv. Walls/screens between balconies shall be designed to avoid foot holes or natural ladders so as to prevent access between balconies/terraces within the development.

v. Adequate signage within the development to identify facilities, entry/exit points and direct movement within the development.

vi. A small portion of each storage area shall be of solid construction (i.e. Cupboard.

(Reason: Safety and surveillance, energy efficiency, amenity)

68. Services - Electricity Supply and Telecommunication Mains

Prior to the issue of any Occupation Certificate, all existing and proposed electricity supplies and telecommunication mains and services around the perimeter of the site shall be relocated underground to the satisfaction of the relevant utility provider and Willoughby City Council at the full cost of the applicant.
(Reason: Compliance)

69. Services - Mailboxes

Prior to the issue of any Occupation Certificate, all mail boxes provided on site shall comply with the requirements of 'Australia Post' in terms of size, location, numbering and clearing. Details of the requirements can be obtained from Australia Post or from their web site. Letter boxes for adaptable dwellings shall comply with AS 4299 Cl 3.8.
(Reason: Legal)

70. Residential Flat Building - Clothes to be Dried in the Open Air

Prior to the issue of any Occupation Certificate, where provision is made to enable clothes to be dried in the open air, this clothes drying area shall be screened by a fence or landscaping on the sides visible from public areas.
(Reason: Amenity)

71. Residential Flat Building - Service Facilities

Prior to the issue of any Occupation Certificate, the following shall apply to the development:

i. Electricity and telephone lines must be placed underground from the street to the building.

ii. One storage area shall be allocated to each unit.

iii. A master TV antenna or satellite dish is to be provided for the building. This shall suitably screened from view from the street.

iv. All plumbing pipes and installations must be concealed in ducts and not exposed on the external walls of the building and must be adequately soundproofed.

v. Secure bicycle parking facilities shall be provided in accordance with Willoughby Development Control Plan Part C. 4 and designed in accordance with AS2890.3.

(Reason: Ensure compliance, streetscape and amenity)

72. Residential Flat Building - Screening of Rooftop Plant/Structures

Prior to the issue of any Occupation Certificate, any rooftop or exposed structures including lift motor rooms, plant rooms etc., together with air conditioning, ventilation and exhaust systems, shall be suitably screened and integrated with the building in order to ensure a properly integrated overall appearance..
(Reason: Visual amenity)

73. Affordable Housing – Fittings and Finishes

Prior to the issue of any Occupation Certificate, the Certifying Authority must be satisfied that the affordable housing dwellings have the internal fittings and finishes at the same standard as the other dwellings within the development and in accordance with the schedule endorsed by Council.

Any costs associated with bringing the affordable housing dwellings to the standards required are to be borne by the applicant.
(Reason: Amenity)

74. Grated Box Drain

Prior to the issue of any Occupation Certificate and for stormwater control, a 325 mm wide grated trench drain with a heavy duty removable galvanised grate is to be provided in front of the garage door/basement parking slab to collect driveway runoff. The trench drain shall be connected to the main drainage system and must have an outlet of minimum diameter 150mm to prevent blockage by silt and debris.
(Reason: Proper disposal of stormwater)

75. On-site Water Management System

The stormwater runoff from the site shall be collected and disposed of via an approved OSD system with a minimum storage volume of 33 m^3 in accordance with Sydney Water's requirements, the NSW Code of Practice – Plumbing and Drainage, Council's DCP and Technical Standards. The construction of the stormwater drainage system of the proposed development shall be generally in accordance with

the approved design stormwater management plans and Council's specification (AUS-SPEC).
(Reason: Prevent nuisance flooding)

76. Sign for On Site Detention System

An aluminium plaque measuring no less than 400mm x 200mm is to be permanently attached and displayed within the immediate vicinity of the OSD system.

The wording for the plaque shall state "*This is the OSD system required by Willoughby City Council. It is an offence to alter any part of the system without written consent from Council. The registered proprietor shall keep the system in good working order by regular maintenance including removal of debris*".
(Reason: Prevent unlawful alteration)

77. Confined Space Sign

Securely install a standard confined space danger sign in a prominent location within the immediate vicinity of access grate of the OSD system.
(Reason: Safe access)

78. Certification of OSD

Prior to the issue of any Occupation Certificate, a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) shall certify on Council's standard certification form that the as-built OSD system is in accordance with the approved plans and complies with Council's DCP and Technical Standards. Council's standard certification form is available in the appendix of Council's Technical Standard No.2.
(Reason: Legal requirement)

79. Works-As-Executed Plans - OSD

Prior to the issue of any Occupation Certificate and upon completion of the OSD System, the following shall be submitted to the Certifying Authority:

- Work-as-Executed plans based on the approved stormwater management plans from a registered surveyor to verify that the volume of storage, PSD, water and floor levels are constructed in accordance with design requirements. Any minor changes or variations to the approved plans should be highlighted in red on the approved stormwater plans.
- Engineer's certification of the OSD system together with the completed Council's standard form for On-Site Detention Record of Installation.

(Reason: Record of works)

80. S88B/S88E(3) Instrument

Create Positive Covenant and Restriction on the Use of Land on the Title in favour of Council as the benefiting authority for the as-built OSD system. The standard wording of the terms of the Positive Covenant and Restriction on the Use of Land are available in Council's Technical Standards.

The above instruments shall be created under Section 88B of the Conveyancing Act 1919 for newly created lots. For an existing lot, the instruments can be created under Section 88E(3) of the Conveyancing Act 1919 using Form 13PC and 13RPA respectively. The relative location of the OSD system, in relation to the building footprint, must be shown on the final plan of subdivision/strata plan or must be shown

on the scale sketch, attached as an annexure to the request 13PC and 13RPA forms. The S88B instrument or 13PC/13RPA forms shall be lodged with Council's Standard S88B/S88E Lodgement Form with all supporting documentations listed in the Form. Council's Standard Form is available from Council upon requested.

Documentary evidence of registration of these instruments with the Land and Property Information shall be submitted to the Principal Certifying Authority and Council prior to issue of any Occupation Certificate.
(Reason: Maintenance requirement)

81. Documentary Evidence of Positive Covenant, Engineers Certificate

Prior to the issue of any Occupation Certificate, the following documentary evidence of the completed drainage works shall be submitted to Certifying Authority and Council: -

- Registered Positive Covenant and Restriction on the Use of Land by way of the Title Deed.
- Certification from a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) for the as-built OSD system and/or plumber's certification of the as-built rainwater reuse system.
- Work-as-Executed plans highlighting in red based on the approved stormwater management plans from a registered surveyor for the as-built OSD system and/or rainwater reuse system.

(Reason: Public record)

82. Splay Corner for Fence

In order to ensure adequate sight distances for pedestrians and traffic in the frontage road, the boundary fence shall be designed and constructed by a 2m x 2.5m splay on both sides of the driveway exit.
(Reason: Pedestrian safety)

83. Construction of Kerb & Gutter

Construct new kerb and gutter together with any necessary associated pavement restoration in accordance with Council's specification for the full frontage of the development site with associated pavement restoration 5 metre wide in Walter Street.
(Reason: Public amenity)

84. Concrete Footpath

Construct a 1.2 m wide concrete footpath for the full frontage of the development site in Walter Street. All works shall be carried out in accordance with Council's standard specification and drawings.
(Reason: Public amenity)

85. Vehicular Crossing

Construct a new vehicular crossing including the replacement of the existing layback and/or gutter and any associated road restoration as directed by Council's Engineers. All works shall be carried out in accordance with Council's specification AUS-SPEC C271 and Council's Standard Drawing SD105 - Council Vehicular Footpath Crossing and Kerb and Gutter details and any approved longitudinal sections. A separate

application for the crossing including current fees and charges is to be submitted for approval by Council.

The crossing is to be 5.5 metres wide with no splays and is to be constructed at right angles to the street kerb in plain concrete. The new crossing shall be located no closer than 1 metre from any power pole and 2 metres from any street tree unless otherwise approved by Council. The centreline of the new crossing shall be "in-line" with the centreline of the parking space(s).

For the design levels of the vehicular crossing at the property boundary, the following shall be complied with:

- At back of layback – 100 mm above and parallel to the gutter invert.
- At property boundary – 350mm above and parallel to the gutter invert.

The footpath which forms part of the proposed crossing shall have a maximum crossfall of 2.5%. The nature strip, natural rock face and footpath is to be adjusted for a minimum distance of 6metres on both sides of the crossing to suit the new levels.

The suitability of the grade of driveway inside the property is the sole responsibility of the applicant and the required alignment levels fixed by Council may impact upon these levels.

All adjustments to the nature strip, footpath and/or public utilities' mains and services as a consequence of the development and any associated construction works shall be carried out at the full cost to the Applicant. All driveway grades and transitions must comply with AS/NZS 2890.1.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.
(Reason: Public amenity)

86. Removal of Redundant Crossings

Remove all redundant crossings together with any necessary works and reinstate the footpath, nature strip and kerb and gutter accordingly. Such work shall be carried out in accordance with Council's specification.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.

(Reason: Public amenity)

87. Inspection of Civil Works on Road Reserves

All required road pavement, footpath, kerb and gutter, drainage works and/or any necessary associated works on the road reserve shall be completed in accordance with the Council approved drawings, conditions and specification (AUS-SPEC).

Pursuant to Section 138 of the Roads Act 1993, all works carried out on the road reserve shall be inspected and approved by Council's Engineer. Upon completion, Work-as-Executed drawings prepared by a registered surveyor shall be submitted to Council for record purposes. A completion certificate shall be obtained from Council

(attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to the issue of any Occupation Certificate.
(Reason: Ensure compliance)

88. Performance Bond

Prior to the issue of any Occupation Certificate, the Applicant shall lodge with the Council a performance bond of $20,000 against defective public civil works undertaken by the main Contractor for a period of twelve (12) months from the date of the completion certificate issued by Council as the road authority under the Roads Act 1993. The bond shall be lodged in the form of a cash deposit, cheque or unconditional bank guarantee which will be refundable subject to the approval of Council's Engineers at the end of the maintenance period. In this period, the Applicant is liable for any part of the work which fails to achieve the design specifications. Council shall be given full authority to make use of the bond for such restoration works within the maintenance period as deemed necessary.
(Reason: Ensure compliance and specification)

89. Turfing of Nature Strip

Prior to the issue of any Occupation Certificate and in the event of damages to the grass verge during works, trim the strip of land between the property boundary and the road, spread topsoil on top of the trimmed surface and lay approved turfing on the prepared surfaces. The turf shall be protected from vehicular traffic and kept watered until established.
(Reason: Public amenity)

90. Vehicle Access - Construction & Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on a site inspection of the constructed vehicle access and accommodation areas, with dimensions measurements as necessary, and must make specific reference to the following:

a) That the as-constructed carpark complies with the approved Construction Certificate plans,

a) That a maximum gradient of 5% has been provided for the first 6 metres from the property boundary to the basement.

b) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.

c) All parking spaces are open type with no partitions.

d) That the as-constructed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,

e) That the headroom clearance of minimum 2.2 metres has been provided between the basement floor and any overhead obstruction to comply with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.

f) That the headroom clearance of minimum 2.5 metres has been provided to all parking spaces for people with disabilities to comply with Section 2.4 of AS2890.6.

g) That the headroom clearance of minimum 4.5 metres has been provided for the loading area for medium rigid vehicles which complies with AS2890.2.

h) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at

the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

91. Tree Planting

Trees are to be planted in accordance with the following table:

No. Required	Species	Location	Min Pot Size
All trees	As indicated on Landscape Plan Dwg No.LP- 01 D dated 12/08/2016 prepared by John Lock & Associates Landscape Architecture	As indicated on the Landscape Plan	As indicated on the Landscape Plan

(Reason: Landscape Amenity)

92. Completion of Landscape Works

Prior to the issue of any Occupation Certificate, the approved landscape works shall be consistent with the approved design, completed to a professional standard, consistent with industry best practice and published standards.
(Reason: Landscape amenity)

93. Public Tree Planting

Plant the following trees on Council land forward of the property:

3 x *Tristaniopsis laurina*

The trees shall:

i. Have a minimum container size of 75 litres and grown to NATSPEC 2 "Guide Specifying Trees", (2003).
ii. Be planted in accordance with WCC Landscape Specification 08/2007 "Street Tree Planting".
iii. Be planted generally in alignment with other street trees.

(Reason: Landscape amenity, tree canopy recruitment)

94. Sound Level Output Certification

The sound level output from the equipment installed for the operation of the building shall not exceed 5dBA above the ambient background noise level measured at the boundaries of the property in accordance with the current Environment Protection Authority (EPA) guidelines for noise assessment. Certification of the level of sound output is to be provided by an appropriately qualified acoustical Consultant to the Certifying Authority prior to issue of the Final Occupation Certificate.
(Reason: Amenity)

95. Acoustic Treatment – Certification

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified acoustic engineer certifying that the acoustic treatment of the building complies with the construction details approved and the relevant design noise criteria.
(Reason: Amenity, environmental compliance and health)

96. Noise Emission – Equipment

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified acoustic engineer certifying that the noise from all sound producing plant, equipment, machinery and/or mechanical ventilation system complies with the relevant noise criteria.
(Reason: Amenity, environmental compliance and health)

97 Certification – Ventilation

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified mechanical engineer certifying that all work associated with the installation of the mechanical and/or natural ventilation systems has been carried out in accordance with the relevant Australian Standards and or alternative solution.
(Reason: Amenity, environmental compliance and health)

98. Waste & Recycling Room

Prior to the issue of any Occupation Certificate, the waste and recycling container room shall be constructed to comply with all the relevant provisions of Willoughby Development Control Plan and in particular :-

a) The floor being graded and drained to an approved drainage outlet connected to the sewer and having a smooth, even surface and coved at all intersections with walls.

b) The walls being cement rendered to a smooth, even surface and coved at all intersections.

c) Cold water being provided in the room with the outlet located in a position so that it cannot be damaged and a hose fitted with a nozzle being connected to the outlet.

d) An overhead type door being provided to the room having a clear opening of not less than 1.8m.

e) A galvanised steel bump rail at least 50 mm clear of the wall being provided at the height of the most prominent part of the garbage containers.

f) Mobile Waste containers or Bulk Bins must have capacity to store waste volume for the development as calculated in accordance with Part C.8 of the Willoughby Development Control Plan and suitable for connection to the garbage collection vehicle being provided in the room. In addition suitable recycling containers must also be provided in the room.

(Reason: Health and amenity)

ADDITIONAL CONDITIONS

The following conditions have been applied to ensure that the use of the land and/or building is carried out in such a manner that is consistent with the aims and objectives of the planning instrument affecting the land, and relevant legislation.

99. Ground Levels

The finished ground levels external to the building are to be consistent with the development consent and are not to be raised.
(Reason: Ensure compliance)

100. Erection Wholly within the Boundaries

All works (with the exception of any works approved under S138 of the Roads Act 1993) including footings, shall be erected wholly within the boundaries of the property.
(Reason: Ensure compliance)

101. On-site Car Parking

The on-site car parking provision of twenty-seven (27) (including five (5) visitor car spaces and one (1) car space per residential unit), 1 motorbike space must be physically identified on site with signposted.

Any visitor parking bays required in accordance with Willoughby Development Control Plan Part C.4, are to be grouped together and physically identified by suitable signs and/or pavement and being permanently accessible and reserved for the exclusive use of visitors to the premises.

On any subsequent strata subdivision of the approved development, the car parking spaces of the approved must not be separate allotments, but part allotments and are to be allocated on the following basis 1 car space per residential unit.

All visitor spaces must be part of the common property on any strata subdivision of the approved development.

(Reason: Ensure Compliance)

102. Security Controlled Car Parking

Should any security controlled car parking arrangement be introduced for the residential visitor, commercial, retail and community facility spaces, a visitor voucher or similar system is to be used to enable free access and parking for the tenants/visitors.
(Reason: Amenity)

103. Motor Cycle Parking

One motorcycle parking space per 25 car parking spaces or part thereof must be provided for motor cycle parking. These spaces are to have an area of 1.2 metres x 3 metres.
(Reason: Amenity)

104. Cycle Racks

Prior to the issue of the occupation certificate, the development must provide two (2) bicycle rack and three (3) bicycle lockers for the use of residents/visitors of the approved development.
(Reason: Alternative Transport)

105. Loading and Unloading

All loading and unloading to the development is to be conducted wholly within the site. Under no circumstances are loading/unloading activities to be conducted from vehicles standing kerbside in Walter Street.

A plan of management with safety and traffic control measures must be prepared for any waste management and removalist activities to occur at the site, including any temporary measures to control vehicles entering and exiting the site when a vehicle is obstructed the vehicular entry. Any waste management and removalist activities to occur at the site and obstruct the vehicular entry must be completed within 15 minutes.

The plan of management must be incorporated in any building management plan and or strata management plan for the approved development.

(Reason: Access and amenity)

106. Stormwater Kerb Outlet

New stormwater connection outlets at street kerb shall be made using 125x75x4 galvanised Rectangular Hollow Section (RHS). Where there are multiple outlets required, a minimum distance of 100mm shall separate these outlets. A grated drainage pit (min. 600mm x 600mm) shall be provided within and adjacent to the property boundary prior to discharging to the Council's drainage system.
(Reason: Protection of public asset)

107. Vehicular Access and Garaging

Driveways and vehicular access ramps shall be designed to provide adequate ground clearance to the underside of B85 vehicles. In all respects, the proposed vehicle access and/or parking spaces shall be designed and constructed to comply with the minimum requirements of AS/NZS 2890.1 and Council's standard specification.
(Reason: Vehicular access)

108. Underground Utility Services

Locate and establish the size and levels of all utility services in the footpath and road reserve. Contact "Dial Before You Dig" Service" prior to commencement of any works.

All adjustments to public utilities' mains and services as a consequence of the development and associated construction works shall be at the full cost to the applicant.
(Reason: Protection of utilities)

109. Public Infrastructure Restoration

Prior to the release of the Damage Deposit, any damaged public infrastructure caused as a result of the construction works on the subject site (including damage caused by, but not limited to , delivery vehicles, waste collection, contractors, sub-contractors, concrete delivery vehicles) must be fully repaired in accordance with Council's specification and AUS-SPEC at no cost to Council.
(Reason: Protection of public assets)

110. Trees on Adjoining Properties

No approval is given for the removal or pruning of trees on the nature strip, adjoining reserves, or neighbouring private land.
(Reason: Environmental protection)

111. Noise Control – Offensive Noise

To minimise the noise impact on the surrounding environment, the use of the premises, building services, equipment, machinery and ancillary fittings shall not give rise to an "offensive noise" as defined under the provisions of the Protection of the Environment Operations Act 1997.
(Reason: Amenity)

112. Waste Materials

No waste materials are to be stored outside the approved waste storage area at any time. The garbage receptacles are not to be used for the disposal of any type of liquid waste.
(Reason: Health and amenity)

113. Refuse Collection Point

A suitable refuse collection point, adjacent to the garbage room(s), must be provided within the building envelope. The loading operation, including the movement of garbage receptacle must take place on a level surface away from gradients and vehicle ramps. No waste/recycling is to be placed on the public footpaths, roadways, plazas, reserves or building colonnade areas, at any time. All garbage receptacles must be returned to the garbage storage area within the property after the bins are serviced.
(Reason: Health and amenity)

114. Waste Management

a) Bins must be regularly cleaned (every 3-6 months).
a) Bins must be returned to bin room as soon as practicable after the servicing of the bins.
b) All bins must be presented at the kerbside for collection. The building manager/cleaner is responsible for presenting bins for collection and returning bins to the bin rooms.

(Reason: Health and Amenity)

PRESCRIBED CONDITIONS

The following conditions are prescribed by S80A of the Environmental Planning & Assessment Act for developments involving building work.

115. Compliance with National Construction Code

All building works must be carried out in accordance with the performance requirements of the National Construction Code.
(Reason: Compliance)

116. Support for Neighbouring Buildings

(1) If development involves an excavation that extends below the level of the base of the footings of a building, structure or work (including any structure or work within a road or rail corridor) on an adjoining property, the person having the benefit of the development consent must, at the person's own expense:
   a) protect and support the building, structure or work from possible damage from the excavation, and
   b) if necessary, underpin and support the building, structure or work to prevent any such damage, and
   c) must, at least 7 days before excavating below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation to the owner of the building being erected or demolished.

(2) The owner of the adjoining allotment of land is not liable for any part of the cost of work carried out for the purposes of this clause, whether carried out on the allotment of land being excavated or on the adjoining allotment of land.

(3) In this clause, "allotment of land" includes a public road and any other public place.

(Reason: Safety)

STATUTORY REQUIREMENTS

The following advisory notes are statutory requirements of the Environmental Planning & Assessment Act and the Environmental Planning & Assessment Regulations and are provided to assist applicants

117. Construction Certificate Required

This consent IS NOT an approval to carry out any building works (with the exception of demolition work). A Construction Certificate is required PRIOR TO ANY BUILDING WORKS BEING COMMENCED.

Enquiries regarding the issue of a construction certificate can be made to Council's Customer Service Centre on 9777 1000.
(Reason: Ensure compliance and statutory requirement)

118 Notify Council of Intention to Commence Works

In accordance with the provisions of Clause 81A(2) of the Environmental Planning and Assessment Act 1979 the person having the benefit of the development consent shall appoint a Certifying Authority and give at least 2 days' notice to Council, in writing, of the persons intention to commence the erection of the building.
(Reason: Information and ensure compliance)

119. Occupation Certificate

The building/structure or part thereof shall not be occupied or used until an interim occupation / final occupation certificate has been issued in respect of the building or part.
(Reason: Safety)

WILLOUGHBY CITY COUNCIL
City of Diversity

PLANNING & INFRASTRUCTURE
Planning Unit

7 April 2017

Notice of Determination of a Development Application

Issued under the Environmental Planning and Assessment Act 1979 Section 81(1)(a)

Development Consent DA-2016/452 (D)

Description of Land: **21-27 WALTER STREET, WILLOUGHBY NSW 2068 LOT 1 and LOT 2 DP 166910, LOT 1 DP 168467, LOT 30 DP 977055**

Willoughby City Council, pursuant to Section 80(1)(a) of the Act, hereby **CONSENTS** to the abovementioned land being used for the following purposes, **subject to compliance** with the Conditions set out in the attached Schedule.

Description of Proposal: Demolition of existing dwellings on site and construction of 2 buildings consisting of 28 residential units over 3-5 levels, landscaping and associated works.

Consent to operate from: 7 April 2017 Consent to lapse on: 8 April 2022

It should be clearly understood that this Consent in no way relieves the owner or applicant from the obligation to obtain any other approval which may be required under the Local Government Act or any other Act. In particular this Consent is not an approval to carry out any building works whatsoever, such requiring the prior issue of a Construction Certificate which can be obtained from Council.

Debra Just
GENERAL MANAGER
per:

NOTES:

(1) To ascertain the date upon which the consent becomes effective refer to Section 83 of the Act.
(2) To ascertain the extent to which the consent is liable to lapse refer to Section 95 of the Act.
(3) Section 82A of the Act confers on an applicant the right to request a review of the Council's determination or conditions attached to the consent within a period of six months (6) from the date of determination.
(4) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within six months (6) after receipt of this notice.
(5) Section 125 of the Act confers the authority to direct any person to comply with the terms and conditions of any Consent and any person failing to comply with such a direction shall be guilty of an offence under the Act.
(6) Section 127A of the Act confers the authority to issue Penalty Notices for certain offences. The penalty for development not carried out in accordance with consent: - Class 1 & 10 buildings is $1500 for an Individual & $3000 for a Corporation - Other building class is $3000 for an Individual & $6000 for a Corporation

Reference: DA-2016/452
Enquiries: Pooja Chugh
Phone: 02 9777 7603

Availability: Available 8.30 -10 am, otherwise by appointment

Willoughby City Council | 31 Victor Street, Chatswood NSW 2067 | P (02) 9777 1000
PO Box 57, Chatswood NSW 2057 | F (02) 9777 1038 | E email@willoughby.nsw.gov.au
www.willoughby.nsw.gov.au | ABN 47 974 826 099

SCHEDULE

Conditions of Consent: (Including reasons for such conditions)

CONSENT IDENTIFICATION

The following condition provides information on what forms part of the Consent.

1. Approved Plan/Details

The development must be in accordance with the following consent plans electronically stamped by Council:

Type	Plan No.	Issue No	Plan Date (as Amended)	Prepared by
Architectural Plans	A.004	F	8 March 2017	Architecture Urbaneia
	A.099	H	8 March 2017	
	A.100	H	8 March 2017	
	A.101, A.102 A.103	G	8 March 2017	
	A.104, A.105	H	24 March 2017	
	A.106	F	8 March 2017	
	A.150	G	8 March 2017	
	A.151	H	8 March 2017	
	A.152, A.153	I	24 March 2017	
	A.154, A.155	E	8 March 2017	
	A.160	H	8 March 2017	
	A.161	E	8 March 2017	
	A.162	H	8 March 2017	
	A.163	C	8 March 2017	
	A.164	I	24 March 2017	
	A.165	C	8 March 2017	
	A.170	B	8 March 2017	
Stormwater Plans Ref: P2016-169 – as amended to satisfy Condition 2	SW01, SW02, SW03 ESCP01	A	8 November 2016	ADCAR Consulting
Landscape Plans Ref: 2329 – as amended to satisfy Condition 2	LP-01 to LP-07 (inclusive)	D	4 November 2016	John Lock & Associates

the application form and any other supporting documentation submitted as part of the application, except for:

a) any modifications which are "Exempt Development" as defined under S76(2) of the Environmental Planning and Assessment Act 1979;

b) otherwise provided by the conditions of this consent.
(Reason: Information and ensure compliance)

PRIOR TO ISSUE OF CONSTRUCTION CERTIFICATE

The following conditions of consent must be complied with prior to the issue of a construction certificate.

2. Revised Plans

The Landscape Plans and Stormwater Plans shall be revised to correspond with the amended Architectural Plans and submitted to the Principal Certifying Authority prior to issue of a Constriction Certificate.
(Reason: Ensure compliance)

3. Section 94A Contributions

Prior to the issue of the Construction Certificate, a monetary contribution of **$106,470.99** (subject to indexing as outlined below) is to be paid in accordance with Section 94A of the Environmental Planning and Assessment Act, 1979.

This contribution is based on 1% of the estimated development cost of $10,647,099 at 9 November 2016 and the adopted Section 94A Contributions Plan.

To calculate the monetary contribution that is payable, the proposed cost of development is to be indexed to reflect quantity variations in the Building Price Index (Enterprise Bargaining Agreement) [BPI(EBA)] between the date the proposed cost of development was agreed by the Council and the date the levy is to be paid as required by this Plan.

To calculate the indexed levy, the formula used to determine the cash contribution is set out below.

$$NL = \$Lo + \$Lo \times \frac{[\text{current index} - \text{base index}]}{\text{base index}}$$

Where:

NL	is the new section 94A levy
Lo	is the original levy
Current index [BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works available at the time of review of the contribution rate
Base index	

[BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works at the date of the proposed cost of development as above

In the event that the current BPI(EBA) is less than the previous BPI(EBA), the current BPI(EBA) shall be taken as not less than the previous BPI(EBA).

Prior to payment Council can provide the value of the indexed levy.

Copies of the S94A Contributions Plan are available for inspection online at www.willoughby.nsw.gov.au
(Reason: Statutory requirement)

4. Services - Energy Australia

The applicant should consult with Energy Australia to determine the need and location of any electrical enclosure for the development. Should such an electrical enclosure be required, the location and dimensions of the structure are to be detailed on all the plans issued with the Construction Certificate. In the event of Energy Australia requiring such a structure eg. a substation, the applicant is required to dedicate the land for the substation as public roadway. The Plan of Dedication shall be lodged to Council prior to issue of the Construction Certificate and registered at the Department of Lands prior to issue of the Occupation Certificate.
(Reason: Compliance)

5. Roof Material – Reflectivity

The external finish to the roof shall be painted or treated in a neutral, recessive non reflective colour range to minimise the effects of glare to neighbouring properties. Roof colour details being submitted with the construction certificate application for approval.
(Reason: Amenity)

6. Adaptable Units

Adaptable residential units for disabled persons are to be provided consistent with the approved plans and supporting Accessibility Assessment Report prepared by Metropolitan Building Approval (Total: 14 Units). Three (3) disabled car spaces are to be nominated on the Construction Certificate drawings and be allocated to the adaptable unit as required under the Willoughby Development Control Plan Part C.6 – Access, Mobility and Adaptability.
(Reason: Access, Mobility and Adaptability)

7. Agreement to Transfer Affordable Housing Dwellings

The applicant must enter into a Deed with the Council providing for the transfer of title of the affordable housing dwelling (identified as Units G05 & G07 on the approved plans with a gross floor area of 101m^2) to the Council, free of charge. The Deed is to be generally in accordance with the Housing Transfer Deed template available at Council and is to be submitted to the Council and executed prior to the issue of the Construction Certificate.

The terms of this agreement must be to the satisfaction of the Council and must include a provision to the effect that the transfer of the dwellings is to be completed

within two months of the registration of any subdivision of the development creating the areas to be dedicated and within 6 months of the issue of an Occupation Certificate. The applicant must agree to pay the Council's reasonable legal costs in satisfying itself that the agreement is appropriate, and a provision to this effect is to be included in the agreement.

The construction certificate plans should demonstrate that the physical requirements specified in the Housing Transfer Deed are satisfied.
(Reason: Ensure compliance)

8. Affordable Housing Fittings and Finishes

Prior to the issue of the Construction Certificate, the applicant is to submit to the Council details of all internal fittings and finishes of the affordable housing dwellings. The applicant is responsible for obtaining written confirmation from Council that it is satisfied that the internal fittings and finishes are at the same standard as other dwellings within the development.
(Reason: Amenity)

9. Sydney Water 'Tap In'

Prior to the issue of the Construction Certificate, the approved plans must be submitted online to "Sydney Water Tap In" to determine whether the development will affect Sydney Water's sewer and water mains and to see if further requirements need to be met.

An approval receipt will need to be obtained prior to release of the Construction Certificate.
(Reason: Ensure compliance)

10. Damage Deposit

Prior to the issue of the Construction Certificate, the applicant shall lodge a Damage Deposit of $70,000 (GST Exempt) as cash, cheque or an unconditional bank guarantee, to Council against possible damage to Council's asset during the course of the building works. The deposit will be refundable subject to inspection by Council after the completion of all works relating to the proposed development. For the purpose of inspections carried out by Council Engineers, an inspection fee of $300 (GST Exempt) is payable to Council. Any damages identified by Council shall be restored by the applicant prior to release of the Damage Deposit.
(Reason: Protection of public asset)

11. Temporary Ground Anchors

Obtain written permission from all private property owners affected by any encroachment either below ground or the air space above as a result of the above works prior to issue of the Construction Certificate. Copies of the permission shall be sent to Council. All works associated with the drilling and stressing of the ground anchors shall be installed in accordance with approved drawings.
(Reason: Encroachment of works)

12. Stormwater to Street Drainage via Reinforced Concrete Pipe (RCP)

Stormwater runoff from the site shall be collected and conveyed to the underground drainage system in Walter Street via a 375 mm RCP in accordance with Council's

specification. A grated drainage pit (min. 600mm x 600mm) shall be provided within the property and adjacent to the boundary prior to discharging to the Council's drainage system. In this regard, full design and construction details showing the method of disposal of surface and roof water from the site are to be submitted to Council for approval prior to the issue of the Construction Certificate.
(Reason: Prevent nuisance flooding)

13. Analysis of Outlet Condition

The capacity of the existing Council stormwater drainage system at the proposed connection of the outlet shall be hydraulically evaluated using the Hydraulic Grade Line method to ensure that no stormwater will be able to surcharge from Council's system to the proposed drainage system. Full engineering details of the hydraulic evaluations prepared and signed by a practising Civil Engineer shall be submitted to Council for consideration prior to the issue of the Construction Certificate.
(Reason: Prevent property damage)

14. Detailed Stormwater Management Plan (SWMP)

Submit for approval by the Accredited Certifier, detailed stormwater management plans in relation to the on-site stormwater management and disposal system for the development. The construction drawings and specifications shall be prepared by a suitably qualified and experienced civil engineer addressing the following:

i. Details of an overflow weir/spillway with an overland flow path that directed to the street shall be provided. Calculations are to be provided on the stormwater plans showing that the overflow elements can cope with any 1 in 100 year ARI storm event.

ii. Submit detailed roof plan (scale 1:100) showing inverted levels and locations of all downpipes, sizes and gradients of all drainage pipes. Stormwater runoff from all non-trafficable roof areas shall be directed to the required OSD system.

ii. The OSD Design and Calculation Checklists shall be completed and signed by a suitably qualified professional engineer and submitted to Council. This is to ensure that the design of the proposed OSD system has been carried out in accordance with Council's DCP and Technical Standard No. 1 – On-Site Detention.

iii. Minimum of two (2) elevations showing the structure including the trash rack, step irons and orifice plates.

iv. The layout of the proposed on-site detention (OSD) shall be shown on the stormwater plans. Finished surface levels within the OSD system shall be provided to enable an accurate assessment of the design storage capacity. The applicant shall in order to ensure that the finished level of the new driveway within the property has no impact to the proposed volume and layout of the OSD system.

v. Stormwater runoff from **all** impervious areas (including roof areas, paving and driveways) must be drained to the OSD system by gravity. Council will allow the driveway runoff to be directed to the proposed **pump -out system and then to the proposed OSD system.**

vi. Location and invert level of all downpipes shall be provided on plans demonstrating that no surcharge from downpipes would occur from the OSD system.

vii. Minimum 300mm freeboard shall be provided for all habitable areas. As such, the placement of the OSD system underneath or above any habitable area is not supported.

viii. All access grates to the OSD tank shall be minimum 600 mm x 900mm. Minimum two (2) open access grate shall be provided for the OSD tank to allow for ventilation and remote flushing of the tank floor.

ix. Internal supporting walls must be minimised and minimum internal depth for the OSD system shall be 900mm for ease of maintenance. Typically internal walls shall only be considered for spans greater than three (3) metres.

All drawings shall comply with Part C.5 of Council's Development Control Plan and Technical Standards, AS3500.3 – *Plumbing and Drainage Code* and BCA.
(Reason: Ensure Compliance)

15. Basement Pumpout Drainage System

Prior to the issue of the Construction Certificate, the applicant shall submit, for approval by the Certifying Authority, detailed stormwater management plans in relation to the pump-out drainage system. The construction drawings and specifications, shall be generally in accordance with the approved stormwater management plans with the following requirements:

- The pumpout drainage system shall comprise with two (2) submersible type pumps. The two pumps shall be designed to work on an alternative basis to ensure both pumps receive equal use and neither remains continuously idle.
- Each pump shall have a minimum capacity of 10L/s or shall be based on the flow rate generated from the 1 in 100 year ARI 5-minutes duration storm event of the area draining into the system, whichever is greater.
- An alarm warning device (including signage and flashing strobe light) shall be provided for the pump-out system to advise the occupant of pump failure. The location of the signage and flashing strobe light shall be shown on the stormwater management plans.
- The volume of the pump-out tank shall be designed with a minimum storage capacity equivalent to the runoff volume generated from of the area draining into the tank for the 1 in 100 year ARI 2-hours duration storm event.

All drawings shall be prepared by a suitably qualified and experienced civil engineer and shall comply with Part C.5 of Council's Development Control Plan, AS3500.3 – *Plumbing and Drainage Code* and the National Construction Code.
(Reason: Prevent nuisance flooding)

16. Construction Management Plan (CMP)

Prior to the issue of the Construction Certificate, submit, for approval by the Certifying Authority, detailed Construction Management Plan (CMP). The CMP shall address:

(a) Construction vehicles access to and egress from the site
(b) Parking for construction vehicles
(c) Locations of site office, accommodation and the storage of major materials

related to the project
(d) Protection of adjoining properties, pedestrians, vehicles and public assets
(e) Location and extent of proposed builder's hoarding and Work Zones
(f) Tree protection management measures for all protected and retained trees.
(Reason: Compliance)

17. Design of Works in Public Road (Roads Act Approval)

Prior to issue of any Construction Certificate, the Applicant must submit, for approval by Council as a road authority, full design engineering plans and specifications prepared by a suitably qualified and experienced civil engineer for the following infrastructure works:

- Construction of 1.2 metres footpath (max. 2.5% crossfall) for the full frontage of the site in Walter Street. All Adjustments to public utility services and associated construction works in the nature strip are to be at the full cost to the applicant. Detailed long section and cross sections at 5 metres interval shall be provided.
- Construction of new kerb and gutter for the full frontage of the development site in Walter Street with 5 metres wide road restoration. Detailed long sections and cross-section at 5m interval shall be provided.
- Construction of 5.5 new vehicular crossings in Walter Street. The design levels at the property boundary shall be in accordance with the driveway long sections.

The required plans must be designed in accordance with Council's specifications (AUS-SPEC). A minimum of three (3) weeks will be required for Council to assess the *Roads Act* submissions. Early submission is recommended to avoid delays in obtaining a Construction Certificate. For the purpose of inspections carried out by Council Engineers, the corresponding fees set out in Council's current *Fees and Charges Schedule* are payable to Council prior to issue of the approved plans. Approval must be obtained from Willoughby City Council as the road authority under the Roads Act 1993 for any proposed works in the public road prior to the issue of any Construction Certificate.
(Reason: Ensure compliance)

18. Splay Corner for Fence

In order to ensure adequate sight distances for pedestrians and traffic in the frontage road, the boundary fence shall be designed and constructed by either a 2m x 2.5m splay on both sides of the driveway exit. Details demonstrating compliance are to be submitted with the construction certificate application.
(Reason: Pedestrian safety)

19. Submit Long Section

Prior to issue of any Construction Certificate, the applicant shall submit, for approval by the Accredited Certifier, longitudinal sections along each side/edge of the proposed vehicular access path drawn at 1:20 Scale. The longitudinal sections shall be prepared by a suitably qualified civil engineer using B99 Ground Clearance Template from AS2890.1 and shall include the following: -

- Horizontal distance from the centreline of the road to the proposed parking slab, including provision of gutter crossing to be in accordance with Council's requirements and specifications.

- Both existing and proposed levels (in AHD) and gradients represented in percentage of the vehicular crossing and driveway.
- Crossfall on road pavement shall be shown on long sections.

The new vehicular crossing is to be 5.5 metres wide with no splays and be constructed at right angle to street kerb. The centreline of the new crossing shall be in-line with the centreline of the internal driveway.

For the design levels of the vehicular crossing at the property boundary, the following shall be complied with:

- At back of layback – 100 mm above and parallel to the gutter invert.
- At property boundary – 350 mm above and parallel to the gutter invert.

All driveway grades and transitions shall comply with AS 2890.1 -2004 and Council's specifications. The suitability of the grade of driveway inside the property is the sole responsibility of the applicant and the required alignment levels fixed by Council may impact upon these levels.

The longitudinal section must demonstrate that a maximum gradient of 5% has been provided for the first 6 metres from the property boundary into the basement and minimum clearance of 2.5 metres (clear from any proposed roller shutter or building above) at the basement entrance can be achieved to comply with AS2890.1.

20. Vehicle Access – Engineer's Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on the architectural drawings and the structural drawings, and must make specific reference to the following:

a) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.

a) That a maximum gradient of 5% is provided for the first 6 metres from the property boundary to the basement.

b) That the proposed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,

c) That the headroom clearance of minimum 2.2 metres between the basement floor and any overhead obstruction is provided which complies with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.

d) That the headroom clearance of minimum 2.5 metres is provided to all parking spaces for people with disabilities which complies with Section 2.4 of AS2890.6.

e) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

21. Geotechnical Report

Submit to the accredited certifier a geotechnical engineer's report of the proposed geotechnical works including excavation, piling, and shoring. The report shall

specifically address safety issues. A report from the Geotechnical Engineer shall be submitted to Council for record purposes.
(Reason: Safety & Amenity)

22. Internal Noise Levels Residential

To minimise the noise intrusion from any external noise source, the building shall be designed and constructed to comply with the following criteria with windows and doors closed:

Internal Space	Time Period	Criteria $L_{Aeq\ (period)}$
Living Areas	Any time	40 dB(A)
Sleeping Areas	Day (7am – 10pm)	40 dB(A)
	Night (10pm – 7am)	35 dB(A)

Note:

1. The above criteria does not apply to kitchens, bathrooms, laundries, foyers, hallways, balconies or outdoor areas.
2. The above criteria define the minimum acceptable levels. Buildings may be built to a better than average standard by applying more stringent criteria.

Certification from an appropriately qualified acoustic consultant that the building has been designed to meet this criteria shall be submitted to the Certifying Authority prior to issue of the Construction Certificate.
(Reason: Amenity, environmental compliance and health)

23. Building Ventilation

To ensure that adequate provision is made for ventilation of the building, mechanical and/or natural ventilation shall be provided. These shall be designed in accordance with the provisions of:

a) The National Construction Code:
   i) AS1668.1, AS1668.2 and AS3666.1 as applicable; and/or
   ii) Alterative solution using an appropriate assessment method

Details of all mechanical ventilation and exhaust systems, and certification provided by an appropriately qualified person verifying compliance with these requirements, shall be submitted to the Certifying Authority prior to the issue of the Construction Certificate.
(Reason: Health and compliance)

24. Hazardous Building Material Assessment

A hazardous building material assessment shall be undertaken by an appropriate qualified person and is to be submitted to the Certifying Authority for approval prior to the issue of the Construction Certificate. The assessment shall identify any likely hazardous materials within any structure to be demolished and provide procedures on how to handle and dispose of such materials.
(Reason: Environmental protection/public health and safety)

25. Noise Mechanical Services

To minimise the impact of noise onto residential receivers, all mechanical services shall be designed and installed to ensure ambient noise levels are maintained. Details of the proposed equipment, siting and any attenuation required shall accompany the application for Construction Certificate.
(Reason: Amenity, environmental compliance and health)

PRIOR TO COMMENCEMENT

The following conditions of consent have been imposed to ensure that the administration and amenities relating to the proposed development comply with all relevant requirements. All of these conditions are to be complied with prior to the commencement of any works on site.

26. Licensee Details

The name, address and contractor licence number of the licensee who has contracted to carry out the work or the name and permit number of the owner-builder who intends to carry out the work shall be furnished in writing to the Certifying Authority prior to commencement of work.
NB: Should changes be made for the carrying out of the work the Certifying Authority must be immediately informed.
(Reason: Information)

27. Building Site Hoarding

Prior to the commencement of work, a hoarding, complying with StateCover NSW requirements which is to be erected to restrict public access to the site (including demolition and/or excavation site), building works, materials or equipment. A separate application is to be made to Council's Infrastructure Services Division for this purpose should the hoarding be located on Council property.
(Reason: Safety)

28. Site Management

A site Management Plan shall be submitted to and approved by the Certifying Authority prior to commencement of work. The site management plan shall include the following measures as applicable.

- Details and contact telephone numbers of the owner, builder and developer;
- Location and construction details of protective fencing to the perimeter of the site;
- Location of site storage areas, sheds and equipment;
- Location of stored building materials for construction;
- Provisions for public safety;
- Dust control measures;
- Site access location and construction;
- Details of methods of disposal of demolition materials;
- Protective measurers for tree preservation;
- Provisions for temporary sanitary facilities;
- Location and size of waste containers and bulk bins;
- Soil and Water Management Plans (SWMP); comprising a site plan indicating the slope of land, access controls, location and type of sediment

controls and storage/control methods for material stockpiles;
- Construction noise and vibration management.

The site management measures shall be implemented prior to the commencement of any site works and maintained during the construction period. A copy of the approved Site Management Plan shall be conspicuously displayed, maintained on site and be made available to the Certifying Authority/Council officers upon request.
(Reason: Environment protection, public health and safety)

29. Dilapidation Report of Adjoining Properties

Prior to commencement of work, submit a photographic survey and report of the adjoining properties 29A, 29 & 19 Walter St Willoughby and Building adjoining the subject lots rear boundary at 14 Artarmon Road Willoughby to the Certifying Authority and all owners of these adjoining properties. Such photographic survey and report shall be prepared by a suitably qualified person, detailing the physical condition of these properties, both internal and external including items as walls, ceilings, roof, structural members and other items as necessary.

In the event of a property owner refusing to allow access to carry out the photographic survey, the proponent must demonstrate in writing to the Certifying Authority, and provide a copy to Council, that the purpose of the survey was made clear to the property owner and that reasonable attempts to obtain access were made.
(Reason: Protection of adjoining owners)

30. Dilapidation Report of Council's Property

Submit a dilapidation report including photographic record of Council's property extending to a distance of 50m from the development, detailing the physical condition of items such as, but not exclusively to, the footpath, roadway, nature strip, and any retaining walls.

The developer may be held liable to any recent damage to public infrastructure in the vicinity of the site, where such damage is not accurately recorded under the requirements of this condition prior to the commencement of works. In this regard, the damage deposit lodged by the applicant may be used by Council to repair such damage on Council's property.

This dilapidation report shall be submitted to Council and the Certifying Authority prior to commencement of work.
(Reason: Protection of Council's infrastructure)

31. Permits and Approvals Required

Application is to be made to Council's Infrastructure Services Division for the following approvals and permits as appropriate:-

a) Permit to erect Builder's hoarding where buildings are to be erected or demolished within 3.50m of the street alignment. Applications are to include current fees and are to be received at least 21 days before commencement of the construction.

b) Permit to stand mobile cranes and/or other major plant on public roads. Applications are to include current fees and security deposits and are to be

received at least seven days before the proposed use. It should be noted that the issue of such permits may also involve approval from the NSW Police Force and the RTA. A separate written application to work outside normal hours must be submitted for approval.

It should also be noted that, in some cases, the above Permits may be refused and temporary road closures required instead which may lead to longer delays due to statutory advertisement requirements.

c) Permit to open public roads, including footpaths, nature strip, vehicular crossing or for any purpose whatsoever. All applications are to include current fees.

d) Permit to place skip/waste bin on footpath and/or nature strip. (Maximum three (3) days).

e) Permit to work and/or place building materials on footpath and/or nature strip. (Maximum two (2) weeks).

f) Permit to establish Works Zone on Public Roads adjacent to the Development including use of footpath area. Applications must be received by Council at least twenty-one days prior to the zone being required. The application will then be referred to the Council's Local Traffic Committee for approval, which may include special conditions.

g) Permit to construct vehicular crossings over Council's footpath, road or nature strip.

(Reason: Legal requirements)

32. Application for Vehicle crossing

Submit an application with fees to Council for the construction of a plain concrete vehicular crossing.
(Reason: Protection of public asset)

33. Spoil Route Plan

Submit a "to and from" spoil removal route plan to Council prior to the commencement of excavation on the site. Such a route plan should show entry and exit locations of all truck movements.
(Reason: Public amenity)

34. Garbage Rooms

Garbage rooms must be large enough to store the generated waste from the proposed uses and allowance should be made for separation of putrescible waste from waste suitable for recycling. The garbage room is not to be smaller than 5000mm x 4000mm, have a 2400mm ceiling height, with a door entry width not less than 2200mm.
(Reason: Ensure compliance)

DURING DEMOLITION, EXCAVATION AND CONSTRUCTION

The following conditions are to be complied with throughout the course of site works including demolition, excavation and construction.

35. Hours of Work

All construction/demolition work relating to this Development Consent within the City, unless varied by an Out of Hours Work Permit, must be carried out only between the hours of 7 am to 5 pm Mondays to Fridays and 7 am to 12 noon on Saturdays. No work is permitted on Sundays or Public Holidays.

An application for an Out of Hours Work Permit to allow variation to these approved hours must be lodged with Council at least 48 hours prior to the proposed commencement of the work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and must be accompanied by the required fee. One (1) permit is required for each variation to the approved working hours within any 24 hour period.

If a variation to these approved hours for multiple or extended periods is sought, an application under Section 96 of the Environmental Planning and Assessment Act 1979 must be lodged with Council at least twenty-one (21) days in advance of the proposed changes to the hours of work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and be accompanied by the required fee. Note: This S96 application may require re-notification in some circumstances.
(Reason: Ensure compliance and amenity)

36. Construction Information Sign

A clearly visible all weather sign is required to be erected in a prominent position on the site detailing:

(a) that unauthorised entry to the work site is prohibited;
(b) the excavator's and / or the demolisher's and / or the builder's name;
(c) contact phone number/after hours emergency number;
(d) licence number;
(e) approved hours of site work; and
(f) name, address and contact phone number of the Certifying Authority (if other than Council)

ANY SUCH SIGN IS TO BE REMOVED WHEN THE WORK HAS BEEN COMPLETED.

Council may allow exceptions where normal use of the building/s concerned will continue with ongoing occupation, or the works approved are contained wholly within the building.
(Reason: Ensure compliance)

37. Building Site Fencing

Public access to the site and building works, materials and equipment on the site is to be restricted, when work is not in progress or the site is unoccupied.

A temporary safety fence is to be provided to protect the public, located to the perimeter of the site (unless the site is separated from the adjoining land by an existing structurally adequate fence, having a minimum height of 1.5m). Temporary fences are to have a minimum height of 1.8m and be constructed of cyclone wire or similar with fabric attached to the inside of the fence to provide dust control.

Fences are to be structurally adequate and be constructed in a good and workmanlike manner and the use of poor quality materials or steel reinforcement mesh as fencing is not permissible. All parts of the fence, including the fencing blocks shall be located wholly within the property boundaries.

The public safety provisions and temporary fences must be in place and be maintained throughout construction.
(Reason: Safety)

38. Provide Erosion and Sediment Control

Erosion and sediment control devices shall be provided wholly within the site whilst work is being carried out in order to prevent sediment and silt from site works (including demolition and/or excavation) being conveyed by stormwater into Council's stormwater system natural watercourses, bushland and neighbouring properties. In this regard, all stormwater discharge from the site shall meet the requirements of the Protection of Environment Operations Act 1997 and the Department of Environment, Climate Change and Water guidelines. The control devices are to be maintained in a serviceable condition AT ALL TIMES.
(Reason: Environmental protection)

39. Suitable Screens

Suitable screens and/or barricades shall be erected during demolition and building work and where required by the Certifying Authority to reduce the emission of noise, dust, water effluent or other matter from the site.
(Reason: Maintain amenity to adjoining properties)

40. Suitable Barricades

Suitable barricades shall be erected during building works on Councils footpath and where directed by the Certifying Authority and/or Council to protect pedestrians using the footpath.
(Reason: Public safety)

41. Demolition Work AS 2601-2001

Any demolition must be carried out in accordance with AS 2601 – 2001, *The demolition of structures.*
(Reason: Safety)

42. Suitable Footpath Crossing Provided

Adequate provision is to be made to ensure that a suitable footpath crossing is provided to the site so as to allow safe pedestrian access along the footpath area at all times.
(Reason: Protection of public safety)

43. Access to Site

During Demolition, Excavation and Construction, access to the site is to be available in all weather conditions, and stabilised to prevent vehicles tracking soil materials onto public roads.
(Reason: Environmental protection)

44. Wash Down and Shaker Areas

During Demolition, Excavation and Construction, wash down and shaker areas are to be provided with facilities for the collection and treatment of waste water.
(Reason: Environmental protection)

45. Asbestos Sign to be Erected

On sites involving demolition or alterations and additions to building where asbestos cement is being repaired, removed or disposed of a standard commercially manufactured sign not less than 400mm x 300mm containing the words "DANGER ASBESTOS REMOVAL IN PROGRESS" is to be erected in a prominent visible position on the site. The sign is to be erected prior to the commencement of works and is to remain in place until such time as all asbestos cement has been removed from the site to an approved waste facility.
(Reason: Public Health and safety/Ensure compliance)

46. Neighbour Notification of Asbestos Removal

The applicant/builder is to notify the adjoining residents five working days prior to demolition works involving removal of asbestos. Such notification is to be clearly written, giving the date work will commence, Work Cover NSW phone number 131 050, Councils phone number 9777 1000.

This notification is to be placed in the letterbox of every property (including every residential flat or unit) either side and immediately at the rear of the site.
(Reason: Public health)

47. Asbestos Removal

Works involving the removal of asbestos must comply with Councils Policy on handling and disposal of asbestos, and must also comply with the Code of Practice for Safe Removal of Asbestos (National Occupational Health and Safety Commission 2012 (1994).

Demolition is to be carried out in accordance with the applicable provisions of Australian Standard AS 2601 – The Demolition of Structures.
(Reason: Public health and safety/Ensure compliance)

48. Asbestos Disposal

All asbestos laden waste, including bonded or friable asbestos must be disposed of at a waste disposal site approved by the NSW Department of Environment, Climate Change and Water.

Upon completion of the asbestos removal and disposal the applicant must furnish the Certifying Authority with a copy of all receipts issued by the waste disposal site as evidence of proper disposal.

(Reason: Environmental protection/Public health and safety)

49. Survey Certificate

Certification of the following shall be submitted to the Certifying Authority by a registered surveyor:

a) Prior to the construction of footings or first completed floor slab (i.e. prior to pouring of concrete) showing the area of the land, building under construction and boundary setbacks;
b) At completion indicating the relation of the building and any projections to the boundaries, and that the building has been erected to the levels approved in the Development Application.

(Reason: Ensure compliance)

50. Road and Footpath

Council's footpath, nature strip or roadway not being damaged and shall be kept clear at all times.
(Reason: Maintain public safety)

51. No Storage on Foot/Roadway

Building materials, plant and equipment and builder's waste, are not to be placed or stored at any time on Council's footpath, nature strip or roadway adjacent to building sites unless prior written approval has been granted by Council.
(Reason: Safety)

52. Skips and Bins

Rubbish skips or bins are not to be placed on Council's footpath, nature strip or roadway unless prior written approval has been granted by Council.
(Reason: Safety)

53. Excavations and Backfilling

All excavations and backfilling associated with the erection or demolition of a building must be executed safely, and must be properly guarded and protected to prevent them from being dangerous to life or property.
(Reason: Safety)

54. Excess or Waste Concrete

Excess or waste concrete from mobile concrete agitators or concrete pumping equipment shall not be washed down, spilled or disposed of onto the road reserve, Council's stormwater system, road, pavement, reserves or Council land.
(Reason: Environmental protection)

55. Temporary Toilet Facilities

Temporary toilet facilities shall be provided to the satisfaction of the Certifying Authority.

The provision of toilet facilities must be completed before any other work is commenced on site. NOTE: Portable toilet facilities are not permitted to be placed on public areas without prior approval having been obtained from Council.
(Reason: Health and amenity)

56. Sweep & Clean Pavement

Sweep and clean pavement surface adjacent to the ingress and egress points of earth, mud and other materials at all times and in particular at the end of each working day or as directed by Council.
(Reason: Legal requirement)

57. Street Signs

The applicant is responsible for the protection of all regulatory / parking / street signs fronting the property. Any damaged or missing street signs as a consequence of the development and associated construction works are to be replaced at full cost to the applicant.
(Reason: Protection of public assets)

58. Tree Protection

i) Retain and protect the following trees and vegetation throughout the demolition and construction period: All trees not indicated for removal on Landscape Plan – Ground Level Dwg No. LP-02 Revision D dated 04/11/2016 prepared by John Lock & Associates
ii) The above trees must be clearly marked and protection devices in place to prevent soil compaction and machinery damage.
iii) Tree roots greater than 50mm diameter are not to be removed unless approved by a qualified arborist on site.
iv) All structures are to bridge roots unless directed by a qualified arborist on site.
v) Tree protection measures must comply with the AS 4970-2009 Protection of trees on development sites with particular reference to Section 4 Tree Protection Measures

(Reason: Tree management)

59. Public Tree Protection

Unless identified by the development consent, no tree roots over 50mm diameter are to be damaged or cut and all structures are to be bridged over such roots.

Should any problems arise with regard to the existing or proposed trees on public land during the construction or bond period, the applicant is to immediately Contact Council's Open Space section and resolve the matter to Council's satisfaction.
(Reason: Tree management)

60. Storage of Materials on Council Land Prohibited

The dumping or storage of building materials, spoil, vegetation, green waste, or any other material in the Council reserve is prohibited.
(Reason: Safety, environmental protection)

61. Unexpected Finds Protocol

An unexpected finds contingency plan should be incorporated into site redevelopment works. In the event that previously unidentified contaminated soils or materials are identified during site redevelopment, works should cease in the immediate vicinity and the affected area isolated to minimise disturbance. A suitably qualified contaminated site consultant should be engaged to assess the degree, type and extent of contamination and establish a suitable remediation plan. The Site Manager/landowner shall notify Council in writing when they become aware of any contamination.
(Reason: Environment & Health Protection)

62. Waste Classification – Excavation Materials

All materials excavated and removed from the site (fill or natural) shall be classified in accordance with the Environment Protection Authority (EPA) Waste Classification Guidelines prior to being disposed of to a NSW approved landfill or to a recipient site.
(Reason: Environment and health protection)

63. Hazardous Materials – Clearance Certificate

Following completion of the removal of any identified hazardous material associated with demolition works, a clearance certificate shall be issued by an appropriately qualified occupational hygienist and submitted to the Certifying Authority. The clearance certificate shall verify that the site is free from any hazardous materials from the demolished buildings.
(Reason: Health and safety)

64. Unexpected Finds Protocol

An unexpected finds contingency plan should be incorporated into site redevelopment works. In the event that previously unidentified contaminated soils or materials are identified during site redevelopment, works should cease in the immediate vicinity and the affected area isolated to minimise disturbance. A suitably qualified contaminated site consultant should be engaged to assess the degree, type and extent of contamination and establish a suitable remediation plan. The Site Manager/landowner shall notify Council in writing when they become aware of any contamination.
(Reason: Environment & Health Protection)

65. Importation of Fill

Any material to be imported onto the site for levelling, construction or engineering purposes must satisfy the Office of Environment & Heritage (OEH) requirements for *virgin excavated natural material* (VENM), or *excavated natural material* (ENM). The determination of VENM or ENM must be made by suitable qualified consultant. Pre-certification of the imported material shall be made and details made available to Council upon request.
(Reason: Environment & Health Protection)

66. Dust Control

The following measures must be taken to control the emission of dust:

a) Dust screens must be erected around the perimeter of the site and be kept in good repair for the duration of the work.

b) Any existing accumulation of dust (e.g. in ceiling voids and wall cavities) must be removed using an industrial vacuum cleaner fitted with a high efficiency particulate air (HEPA) filter.

c) All dusty surfaces must be wet down and any dust created must be suppressed by means of a fine water spray. Water used for dust suppression must not be allowed to enter the street or stormwater system.

d) All stockpiles of materials that are likely to generate dust must be kept damp or covered.

e) Demolition work must not be carried out during high winds, which may cause dust to spread beyond the boundaries of the site.

(Reason: Amenity)

67. Construction Noise

Construction noise shall be controlled to comply with the requirements as set out in the EPA Interim Construction Noise Guideline. Noise levels shall not exceed the rated background level by more than 10dB(A) at the most sensitive receiver during the standard construction hours. A noise monitoring plan shall be implemented during construction. Where noise levels may be exceeded appropriate measures to control excessive noise shall be implemented immediately.
(Reason: Amenity)

PRIOR TO OCCUPATION OF THE DEVELOPMENT

The following conditions of consent must be complied with prior to the issue of an occupation certificate.

68. Section 73 Compliance Certificate

A Section 73 Compliance Certificate under the Sydney Water Act 1994 must be obtained prior to the issue of a Final Occupation Certificate. Application must be made through an authorised Water Servicing Coordinator, for details see Customer Service, Urban Development at www.sydneywater.com.au or telephone 13 20 92.

The Section 73 Certificate must be submitted to the Certifying Authority.
(Reason: Ensure statutory compliance)

69. Street Numbering

Prior to the issue of any Occupation Certificate, written application shall be made to the Geospatial Services Section of Council for the allocation of street numbering for each of the newly created strata lots and/or allotments. Documentary evidence of the allocated numbering issued by Council is to be lodged with the Subdivision Certificate Application and Linen Plans.
(Reason: Ensure compliance with Council street numbering policy)

70. Fire Safety Certificate Forwarded to NSW Fire and Rescue

Prior to the issue of the Final Occupation Certificate and upon completion of the building work, a Fire Safety Certificate shall be furnished by the owner to Council, and the owner must cause a copy of the certificate (together with a copy of the current fire safety schedule) to be forwarded to the Commissioner of New South Wales Fire and Rescue, and must cause a further copy of the certificate (together with a copy of the current fire safety schedule) to be prominently displayed in the building in accordance with Clause 172 of the Environmental Planning and Assessment Regulation 2000 in respect to each essential fire safety measure included in the Schedule attached to the Construction Certificate.
(Reason: Safety)

71. Registration of Plan of Consolidation

Prior to the issue of any Occupation Certificate, all individual allotments involved in the development site shall be consolidated into a single allotment and evidence of the registration of the plan of consolidation to be submitted to Council.
(Reason: Ensure compliance)

72. Safer by Design

Prior to the issue of any Occupation Certificate and to minimise the opportunity for crime and in accordance with CPTED principles, the development shall incorporate the following:

i. In order to maintain a safe level of visibility for pedestrians within the development, adequate lighting to AS1158 is to be provided to all common areas including the basement car park, common open space and any common stair access to these areas and pedestrian routes, particularly including the waste storage areas.

   This lighting shall ensure consistency to avoid contrasts between areas of shadow/illumination and preferably be solar powered and with an automatic/timed switching mechanism, motion sensor or equivalent for energy efficiency. Such lighting shall be installed and directed in such a manner so as to ensure that no nuisance is created for surrounding properties or to drivers on surrounding streets. Car parking lighting system is to be controlled by sensors to save energy during periods of no occupant usage.

ii. The ceiling and vertical structures of the basement parking area shall be painted white (or equivalent) in order to ensure good visibility, surveillance and less reliance on artificial lighting lux levels.

iii. The design, installation and maintenance of landscaping (and associated works) within pedestrian routes around the site (and adjacent to mailboxes) shall not impede visibility and clear sight lines along the pedestrian footway from one end to the other.

iv. The means to isolate the residential and commercial components of the building shall be incorporated into the development, including the security keying of lifts and doors and other measures for access control.

v. Walls/screens between balconies shall be designed to avoid foot holes or natural ladders so as to prevent access between balconies/terraces within the development.

vi. Adequate signage within the development to identify facilities, entry/exit points and direct movement within the development.

vii. A small portion of each storage area shall be of solid construction (i.e. Cupboard.

(Reason: Safety and surveillance, energy efficiency, amenity)

73. Services - Electricity Supply and Telecommunication Mains

Prior to the issue of any Occupation Certificate, all existing and proposed electricity supplies and telecommunication mains and services around the perimeter of the site shall be relocated underground to the satisfaction of the relevant utility provider and Willoughby City Council at the full cost of the applicant.
(Reason: Compliance)

74. Services - Mailboxes

Prior to the issue of any Occupation Certificate, all mail boxes provided on site shall comply with the requirements of 'Australia Post' in terms of size, location, numbering and clearing. Details of the requirements can be obtained from Australia Post or from their web site. Letter boxes for adaptable dwellings shall comply with AS 4299 Cl 3.8.
(Reason: Legal)

75. Residential Flat Building - Clothes to be Dried in the Open Air

Prior to the issue of any Occupation Certificate, where provision is made to enable clothes to be dried in the open air, this clothes drying area shall be screened by a fence or landscaping on the sides visible from public areas.
(Reason: Amenity)

76. Residential Flat Building - Service Facilities

Prior to the issue of any Occupation Certificate, the following shall apply to the development:

i. Electricity and telephone lines must be placed underground from the street to the building.

ii. One storage area shall be allocated to each unit.

iii. A master TV antenna or satellite dish is to be provided for the building. This shall suitably screened from view from the street.

iv. All plumbing pipes and installations must be concealed in ducts and not exposed on the external walls of the building and must be adequately soundproofed.

v. Secure bicycle parking facilities shall be provided in accordance with Willoughby Development Control Plan Part C. 4 and designed in accordance with AS2890.3.

(Reason: Ensure compliance, streetscape and amenity)

77. Residential Flat Building - Screening of Rooftop Plant/Structures

Prior to the issue of any Occupation Certificate, any rooftop or exposed structures including lift motor rooms, plant rooms etc., together with air conditioning, ventilation

and exhaust systems, shall be suitably screened and integrated with the building in order to ensure a properly integrated overall appearance.
(Reason: Visual amenity)

78. Affordable Housing – Fittings and Finishes

Prior to the issue of any Occupation Certificate, the Certifying Authority must be satisfied that the affordable housing dwellings have the internal fittings and finishes at the same standard as the other dwellings within the development and in accordance with the schedule endorsed by Council.

Any costs associated with bringing the affordable housing dwellings to the standards required are to be borne by the applicant.
(Reason: Amenity)

79. Grated Box Drain

Prior to the issue of any Occupation Certificate and for stormwater control, a 325 mm wide grated trench drain with a heavy duty removable galvanised grate is to be provided in front of the garage door/basement parking slab to collect driveway runoff. The trench drain shall be connected to the main drainage system and must have an outlet of minimum diameter 150mm to prevent blockage by silt and debris.
(Reason: Proper disposal of stormwater)

80. On-site Water Management System

The stormwater runoff from the site shall be collected and disposed of via an approved OSD system with a minimum storage volume of 59 m^3 in accordance with Sydney Water's requirements, the NSW Code of Practice – Plumbing and Drainage, Council's DCP and Technical Standards. The construction of the stormwater drainage system of the proposed development shall be generally in accordance with the approved design stormwater management plans and Council's specification (AUS-SPEC).
(Reason: Prevent nuisance flooding)

81. Sign for On Site Detention System

An aluminium plaque measuring no less than 400mm x 200mm is to be permanently attached and displayed within the immediate vicinity of the OSD system.

The wording for the plaque shall state "*This is the OSD system required by Willoughby City Council. It is an offence to alter any part of the system without written consent from Council. The registered proprietor shall keep the system in good working order by regular maintenance including removal of debris".*
(Reason: Prevent unlawful alteration)

82. Confined Space Sign

Securely install a standard confined space danger sign in a prominent location within the immediate vicinity of access grate of the OSD system.
(Reason: Safe access

83. Certification of OSD

Prior to the issue of any Occupation Certificate, a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) shall certify on Council's standard certification form that the as-built OSD system is in accordance with the approved plans and complies with Council's DCP and Technical Standards. Council's standard certification form is available in the appendix of Council's Technical Standard No.2.
(Reason: Legal requirement)

84. Certification of the Basement Pumpout Drainage System

Prior to the issue of any Occupation Certificate and upon completion of the pump-out system, the following shall be submitted to the Certifying Authority.

- A suitably qualified and experienced civil engineer (generally CP Eng. Qualification) shall certify that the as-built pumpout system complies with Part C5 of Council's DCP, all relevant codes and standards and the approved stormwater management plans.
- Work-as-executed plans based on the approved pump-out system plans from a registered surveyor to verify that the volume of storage and pump capacity are in accordance with design requirements. Any minor changes or variations to the approved plans should be highlighted in red on the approved pump-out system plans.
- Certification from a licensed plumber to ensure that the constructed pump-out system complies with the current plumbing requirements of Sydney Water and Committee on Uniformity of Plumbing and Drainage Regulations of NSW.

(Reason: Ensure compliance)

85. Works-As-Executed Plans - OSD

Prior to the issue of any Occupation Certificate and upon completion of the OSD System, the following shall be submitted to the Certifying Authority:

- Work-as-Executed plans based on the approved stormwater management plans from a registered surveyor to verify that the volume of storage, PSD, water and floor levels are constructed in accordance with design requirements. Any minor changes or variations to the approved plans should be highlighted in red on the approved stormwater plans.
- Engineer's certification of the OSD system together with the completed Council's standard form for On-Site Detention Record of Installation.

(Reason: Record of works)

86. S88B/S88E(3) Instrument

Create Positive Covenant and Restriction on the Use of Land on the Title in favour of Council as the benefiting authority for the as-built OSD system. The standard wording of the terms of the Positive Covenant and Restriction on the Use of Land are available in Council's Technical Standards.

The above instruments shall be created under Section 88B of the Conveyancing Act 1919 for newly created lots. For an existing lot, the instruments can be created under Section 88E(3) of the Conveyancing Act 1919 using Form 13PC and 13RPA respectively. The relative location of the OSD system, in relation to the building footprint, must be shown on the final plan of subdivision/strata plan or must be shown on the scale sketch, attached as an annexure to the request 13PC and 13RPA forms. The S88B instrument or 13PC/13RPA forms shall be lodged with Council's Standard

S88B/S88E Lodgement Form with all supporting documentations listed in the Form. Council's Standard Form is available from Council upon requested.

Documentary evidence of registration of these instruments with the Land and Property Information shall be submitted to the Principal Certifying Authority and Council prior to issue of any Occupation Certificate.
(Reason: Maintenance requirement)

87. Documentary Evidence of Positive Covenant, Engineers Certificate

Prior to the issue of any Occupation Certificate, the following documentary evidence of the completed drainage works shall be submitted to Certifying Authority and Council: -

- Registered Positive Covenant and Restriction on the Use of Land by way of the Title Deed.
- Certification from a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) for the as-built OSD system and/or plumber's certification of the as-built rainwater reuse system.
- Work-as-Executed plans highlighting in red based on the approved stormwater management plans from a registered surveyor for the as-built OSD system and/or rainwater reuse system.

(Reason: Public record)

88. Splay Corner for Fence

In order to ensure adequate sight distances for pedestrians and traffic in the frontage road, the boundary fence shall be designed and constructed by a 2m x 2.5m splay on both sides of the driveway exit.
(Reason: Pedestrian safety)

89. Construction of Kerb & Gutter

Construct new kerb and gutter together with any necessary associated pavement restoration in accordance with Council's specification for the full frontage of the development site with associated pavement restoration 5 metre wide in Walter Street.
(Reason: Public amenity)

90. Concrete Footpath

Construct a 1.2 m wide concrete footpath for the full frontage of the development site in Walter Street. All works shall be carried out in accordance with Council's standard specification and drawings.
(Reason: Public amenity)

91. Vehicular Crossing

Construct a new vehicular crossing including the replacement of the existing layback and/or gutter and any associated road restoration as directed by Council's Engineers. All works shall be carried out in accordance with Council's specification AUS-SPEC C271 and Council's Standard Drawing SD105 - Council Vehicular Footpath Crossing and Kerb and Gutter details and any approved longitudinal sections. A separate application for the crossing including current fees and charges is to be submitted for approval by Council.

The crossing is to be 5.5 metres wide with no splays and is to be constructed at right angles to the street kerb in plain concrete. The new crossing shall be located no closer than 1 metre from any power pole and 2 metres from any street tree unless otherwise approved by Council. The centreline of the new crossing shall be "in-line" with the centreline of the parking space(s).

For the design levels of the vehicular crossing at the property boundary, the following shall be complied with:

- At back of layback – 100 mm above and parallel to the gutter invert.
- At property boundary – 350mm above and parallel to the gutter invert.

The footpath which forms part of the proposed crossing shall have a maximum crossfall of 2.5%. The nature strip, natural rock face and footpath are to be adjusted for a minimum distance of 8 metres on both sides of the crossing to suit the new levels.

The suitability of the grade of driveway inside the property is the sole responsibility of the applicant and the required alignment levels fixed by Council may impact upon these levels.

All adjustments to the nature strip, footpath and/or public utilities' mains and services as a consequence of the development and any associated construction works shall be carried out at the full cost to the Applicant. All driveway grades and transitions must comply with AS/NZS 2890.1.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.
(Reason: Public amenity)

92. Removal of Redundant Crossings

Remove all redundant crossings together with any necessary works and reinstate the footpath, nature strip and kerb and gutter accordingly. Such work shall be carried out in accordance with Council's specification.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.
(Reason: Public amenity)

93. Inspection of Civil Works on Road Reserves

All required road pavement, footpath, kerb and gutter, drainage works and/or any necessary associated works on the road reserve shall be completed in accordance with the Council approved drawings, conditions and specification (AUS-SPEC).

Pursuant to Section 138 of the Roads Act 1993, all works carried out on the road reserve shall be inspected and approved by Council's Engineer. Upon completion, Work-as-Executed drawings prepared by a registered surveyor shall be submitted to Council for record purposes. A completion certificate shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to the issue of any Occupation Certificate.
(Reason: Ensure compliance)

94. Performance Bond

Prior to the issue of any Occupation Certificate, the Applicant shall lodge with the Council a performance bond of $35,000 against defective public civil works undertaken by the main Contractor for a period of twelve (12) months from the date of the completion certificate issued by Council as the road authority under the Roads Act 1993. The bond shall be lodged in the form of a cash deposit, cheque or unconditional bank guarantee which will be refundable subject to the approval of Council's Engineers at the end of the maintenance period. In this period, the Applicant is liable for any part of the work which fails to achieve the design specifications. Council shall be given full authority to make use of the bond for such restoration works within the maintenance period as deemed necessary.
(Reason: Ensure compliance and specification)

95. Turfing of Nature Strip

Prior to the issue of any Occupation Certificate and in the event of damages to the grass verge during works, trim the strip of land between the property boundary and the road, spread topsoil on top of the trimmed surface and lay approved turfing on the prepared surfaces. The turf shall be protected from vehicular traffic and kept watered until established.
(Reason: Public amenity)

96. Completion of Landscape Works

Prior to the issue of any Occupation Certificate, the approved landscape works shall be consistent with the approved design, completed to a professional standard, consistent with industry best practice and published standards.
(Reason: Landscape amenity)

97. Tree Planting

Prior to the issue of any Occupation Certificate, trees are to be planted in accordance with the following table:

No. Required	Species	Location	Min Pot Size
All trees	As indicated on Landscape Plan – Ground Level Dwg No. LP-02 Revision D dated 04/11/2016 prepared by John Lock & Associates	As indicated on the Landscape Plan	As indicated on the Landscape Plan

(Reason: Landscape amenity)

98. Sound Level Output Certification

The sound level output from the equipment installed for the operation of the building shall not exceed 5dBA above the ambient background noise level measured at the boundaries of the property in accordance with the current Environment Protection Authority (EPA) guidelines for noise assessment. Certification of the level of sound output is to be provided by an appropriately qualified acoustical Consultant to the Certifying Authority prior to issue of the Final Occupation Certificate.
(Reason: Amenity)

99. Noise Emission – Equipment

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified acoustic engineer certifying that the noise from all sound producing plant, equipment, machinery and/or mechanical ventilation system complies with the relevant noise criteria.
(Reason: Amenity, environmental compliance and health)

100. Acoustic Treatment – Certification

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified acoustic engineer certifying that the acoustic treatment of the building complies with the construction details approved and the relevant design noise criteria.
(Reason: Amenity, environmental compliance and health)

101. Certification – Ventilation

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified mechanical engineer certifying that all work associated with the installation of the mechanical and/or natural ventilation systems has been carried out in accordance with the relevant Australian Standards and or alternative solution.
(Reason: Amenity, environmental compliance and health)

102. Waste & Recycling Room

Prior to the issue of any Occupation Certificate, the waste and recycling container room shall be constructed to comply with all the relevant provisions of Willoughby Development Control Plan and in particular :-

a) The floor being graded and drained to an approved drainage outlet connected to the sewer and having a smooth, even surface, coved at all intersections with walls.

b) The walls being cement rendered to a smooth, even surface and coved at all intersections.

c) Cold water being provided in the room with the outlet located in a position so that it cannot be damaged and a hose fitted with a nozzle being connected to the outlet.

d) An overhead type door being provided to the room having a clear opening of not less than 1.8m.

e) A galvanised steel bump rail at least 50 mm clear of the wall being provided at the height of the most prominent part of the garbage containers.

f) Mobile containers having a capacity calculated in accordance with Part C.8.4.7 of the Willoughby Development Control Plan and suitable for connection to the garbage collection vehicle being provided in the room. In addition suitable recycling containers must also be provided in the room.

(Reason: Health and amenity)

ADDITIONAL CONDITIONS

The following conditions have been applied to ensure that the use of the land and/or building is carried out in such a manner that is consistent with the aims and objectives of the planning instrument affecting the land, and relevant legislation.

103. Ground Levels

The finished ground levels external to the building are to be consistent with the development consent and are not to be raised.
(Reason: Ensure compliance)

104. Erection Wholly within the Boundaries

All works (with the exception of any works approved under S138 of the Roads Act 1993) including footings, shall be erected wholly within the boundaries of the property.
(Reason: Ensure compliance)

105. On-site Car Parking

The on-site car parking provision of thirty five (35) car parking spaces including seven (7) visitor car parking space and two (2) motorbike spaces must be physically identified on site and signposted.

Any visitor parking bays required in accordance with Willoughby Development Control Plan Part C.4, are to be grouped together and physically identified by suitable signs and/or pavement and being permanently accessible and reserved for the exclusive use of visitors to the premises.

On any subsequent strata subdivision of the approved development, the car parking spaces of the approved must not be separate allotments, but part allotments and are to be allocated on the following basis 1 car space per residential unit.

All visitor spaces must be part of the common property on any strata subdivision of the approved development.
(Reason: Ensure Compliance)

106. Security Controlled Car Parking

Should any security controlled car parking arrangement be introduced for the residential visitor, commercial, retail and community facility spaces, a visitor voucher or similar system is to be used to enable free access and parking for the tenants/visitors.
(Reason: Amenity)

107. Motor Cycle Parking

One motorcycle parking space per 25 car parking spaces or part thereof must be provided for motor cycle parking. These spaces are to have an area of 1.2 metres x 3 metres.
(Reason: Amenity)

108. Cycle Racks

Prior to the issue of the occupation certificate, the development must provide three (3) bicycle rack and three (3) bicycle lockers for the use of residents/visitors of the approved development.
(Reason: Alternative Transport)

109. Loading and Unloading

All loading and unloading to the development is to be conducted wholly within the site. Under no circumstances are loading/unloading activities to be conducted from vehicles standing kerbside in Walter Street.

A plan of management with safety and traffic control measures must be prepared for any waste management and removalist activities to occur at the site, including any temporary measures to control vehicles entering and exiting the site when a vehicle is obstructed the vehicular entry. Any waste management and removalist activities to occur at the site and obstruct the vehicular entry must be completed within 15 minutes.

The plan of management must be incorporated in any building management plan and or strata management plan for the approved development.
(Reason: Access and amenity)

110. Vehicular Access and Garaging

Driveways and vehicular access ramps shall be designed to provide adequate ground clearance to the underside of B85 vehicles. In all respects, the proposed vehicle access and/or parking spaces shall be designed and constructed to comply with the minimum requirements of AS/NZS 2890.1 and Council's standard specification.
(Reason: Vehicular access)

111. Underground Utility Services

Locate and establish the size and levels of all utility services in the footpath and road reserve. Contact "Dial Before You Dig" Service" prior to commencement of any works.

All adjustments to public utilities' mains and services as a consequence of the development and associated construction works shall be at the full cost to the applicant.
(Reason: Protection of utilities)

112. Public Infrastructure Restoration

Prior to the release of the Damage Deposit, any damaged public infrastructure caused as a result of the construction works on the subject site (including damage caused by, but not limited to , delivery vehicles, waste collection, contractors, sub-contractors, concrete delivery vehicles) must be fully repaired in accordance with Council's specification and AUS-SPEC at no cost to Council.
(Reason: Protection of public assets)

113. Vehicle Access - Construction & Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on a site inspection of the constructed vehicle access and accommodation areas, with dimensions measurements as necessary, and must make specific reference to the following:

a) That the as-constructed carpark complies with the approved Construction Certificate plans,

a) That a maximum gradient of 5% has been provided for the first 6 metres from the property boundary to the basement.

b) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.

c) All parking spaces are open type with no partitions.

d) That the as-constructed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,

e) That the headroom clearance of minimum 2.2 metres has been provided between the basement floor and any overhead obstruction to comply with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.

f) That the headroom clearance of minimum 2.5 metres has been provided to all parking spaces for people with disabilities to comply with Section 2.4 of AS2890.6.

g) That the headroom clearance of minimum 4.5 metres has been provided for the loading area for medium rigid vehicles which complies with AS2890.2.

h) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

114. Trees on Adjoining Properties

No approval is given for the removal or pruning of trees on the nature strip, adjoining reserves, or neighbouring private land.
(Reason: Environmental protection)

115. Noise Control – Offensive Noise

To minimise the noise impact on the surrounding environment, the use of the premises, building services, equipment, machinery and ancillary fittings shall not give rise to an "offensive noise" as defined under the provisions of the Protection of the Environment Operations Act 1997.
(Reason: Amenity)

116. Waste Materials

No waste materials are to be stored outside the approved waste storage area at any time. The garbage receptacles are not to be used for the disposal of any type of liquid waste.
(Reason: Health and amenity)

117. Refuse Collection Point

A suitable refuse collection point, adjacent to the garbage room(s), must be provided within the building envelope. The loading operation, including the movement of garbage receptacle must take place on a level surface away from gradients and vehicle ramps. No waste/recycling is to be placed on the public footpaths, roadways, plazas, reserves or building colonnade areas, at any time. All garbage receptacles must be returned to the garbage storage area within the property after the bins are serviced.
(Reason: Health and amenity)

118. Waste Management

a) Bins must be regularly cleaned (every 3-6 months).
b) Bins must be returned to bin room as soon as practicable after the servicing of the bins.
c) All bins must be presented at the kerbside for collection. The building manager/cleaner is responsible for presenting bins for collection and returning bins to the bin rooms.

(Reason: Health and Amenity)

PRESCRIBED CONDITIONS

The following conditions are prescribed by S80A of the Environmental Planning & Assessment Act for developments involving building work.

119. Compliance with National Construction Code

All building works must be carried out in accordance with the performance requirements of the National Construction Code.
(Reason: Compliance)

120. Support for Neighbouring Buildings

(1) If development involves an excavation that extends below the level of the base of the footings of a building, structure or work (including any structure or work within a road or rail corridor) on an adjoining property, the person having the benefit of the development consent must, at the person's own expense:
   a) protect and support the building, structure or work from possible damage from the excavation, and
   b) if necessary, underpin and support the building, structure or work to prevent any such damage, and
   c) must, at least 7 days before excavating below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation to the owner of the building being erected or demolished.

(2) The owner of the adjoining allotment of land is not liable for any part of the cost of work carried out for the purposes of this clause, whether carried out on the allotment of land being excavated or on the adjoining allotment of land.

(3) In this clause, "allotment of land" includes a public road and any other public place.

(Reason: Safety)

STATUTORY REQUIREMENTS

The following advisory notes are statutory requirements of the Environmental Planning & Assessment Act and the Environmental Planning & Assessment Regulations and are provided to assist applicants

121. Construction Certificate Required

This consent IS NOT an approval to carry out any building works (with the exception of demolition work). A Construction Certificate is required PRIOR TO ANY BUILDING WORKS BEING COMMENCED.

Enquiries regarding the issue of a construction certificate can be made to Council's Customer Service Centre on 9777 1000.
(Reason: Ensure compliance and statutory requirement)

122. Notify Council of Intention to Commence Works

In accordance with the provisions of Clause 81A(2) of the Environmental Planning and Assessment Act 1979 the person having the benefit of the development consent shall appoint a Certifying Authority and give at least 2 days' notice to Council, in writing, of the persons intention to commence the erection of the building.
(Reason: Information and ensure compliance)

123. Occupation Certificate

The building/structure or part thereof shall not be occupied or used until an interim occupation / final occupation certificate has been issued in respect of the building or part.
(Reason: Safety)

WILLOUGHBY CITY COUNCIL
City of Diversity

PLANNING & INFRASTRUCTURE
Planning Unit

1 February 2017

Notice of Determination of a Development Application

Issued under the Environmental Planning and Assessment Act 1979 Section 81(1)(a)

Development Consent DA-2016/210 (W)

Description of Land: **5-9 WALTER STREET, WILLOUGHBY NSW 2068**
LOT 1 DP 150607, LOT 2 DP 150607, LOT 3 DP 150607

Willoughby City Council, pursuant to Section 80(1)(a) of the Act, hereby **CONSENTS** to the abovementioned land being used for the following purposes, **subject to compliance** with the Conditions set out in the attached Schedule.

Description of Proposal: Demolition of dwelling and construction of a residential flat building, landscaping, basement carparking and associated works.

Consent to operate from: 1 Feb 2017 **Consent to lapse on: 2 Feb 2022**

It should be clearly understood that this Consent in no way relieves the owner or applicant from the obligation to obtain any other approval which may be required under the Local Government Act or any other Act. In particular this Consent is not an approval to carry out any building works whatsoever, such requiring the prior issue of a Construction Certificate which can be obtained from Council.

Debra Just
GENERAL MANAGER
per:

NOTES:

(1) To ascertain the date upon which the consent becomes effective refer to Section 83 of the Act.
(2) To ascertain the extent to which the consent is liable to lapse refer to Section 95 of the Act.
(3) Section 82A of the Act confers on an applicant the right to request a review of the Council's determination or conditions attached to the consent within a period of six months (6) from the date of determination.
(4) Section 97 of the Act confers on an applicant who is dissatisfied with the determination of a consent authority a right of appeal to the Land and Environment Court exercisable within six months (6) after receipt of this notice.
(5) Section 125 of the Act confers the authority to direct any person to comply with the terms and conditions of any Consent and any person failing to comply with such a direction shall be guilty of an offence under the Act.
(6) Section 127A of the Act confers the authority to issue Penalty Notices for certain offences. The penalty for development not carried out in accordance with consent: - Class 1 & 10 buildings is $1500 for an Individual & $3000 for a Corporation - Other building class is $3000 for an Individual & $6000 for a Corporation

Reference: DA-2016/210
Enquiries: Annie Leung
Phone: 02 9777 7643

Availability: Available 8.30 -10 am, otherwise by appointment

Willoughby City Council | 31 Victor Street, Chatswood NSW 2067 | P (02) 9777 1000
PO Box 57, Chatswood NSW 2057 | F (02) 9777 1038 | E email@willoughby.nsw.gov.au
www.willoughby.nsw.gov.au | ABN 47 974 826 099

SCHEDULE

Conditions of Consent: (Including reasons for such conditions)

CONSENT IDENTIFICATION

The following condition provides information on what forms part of the Consent.

1. Approved Plan/Details

The development must be in accordance with the following consent plans electronically stamped by Council:

Type	Plan No.	Revision/ Issue No	Plan Date (as Amended)	Prepared by
Architectural plans	A101, A102, A103	H	13/10/2016	Architecture Urbaneia
	A104	F	25/08/2016	Architecture Urbaneia
	A150, A151, A152, A153,	H	13/10/2016	Architecture Urbaneia
	A160	C	13/10/2016	Architecture Urbaneia
	A161	H	13/10/2016	Architecture Urbaneia
	A162	C	13/10/2016	Architecture Urbaneia
	A163	H	13/10/2016	Architecture Urbaneia
	A164	C	13/10/2016	Architecture Urbaneia
	A165	C	13/10/2016	Architecture Urbaneia
Above mentioned are as amended by plans numbered A099 Issue I and A100 Issue K dated 05/12/2016 prepared by Architecture Urbaneia.				
Stormwater P2016-131	SW01, SW02, SW03	A	06.06.2016	ADCAR Consulting
Landscape Plans 2314	LP01	E	26/10/2016	John Lock & Associates
Landscape Plans 2314	LP02, LP03, LP04	D	03/06/2016	John Lock & Associates

the application form and any other supporting documentation submitted as part of the application, except for:

a) any modifications which are "Exempt Development" as defined under S76(2) of the Environmental Planning and Assessment Act 1979;

b) otherwise provided by the conditions of this consent.
(Reason: Information and ensure compliance)

PRIOR TO ISSUE OF CONSTRUCTION CERTIFICATE

The following conditions of consent must be complied with prior to the issue of a construction certificate.

2. Amendments

Prior to the issue of the Construction Certificate, the proposal is to be amended in the following manner:

a) A roller door or similar to be provided from the garbage room to allow easy access.

b) The layout of the basement car park is to be amended to provided:

   a. Twenty – eight (28) residential car spaces including three (3) disabled car spaces are required to be provided in accordance with AS2890.6. The disabled car spaces must be allocated to the adaptable units required by this consent.

   b. Seven (7) visitor car spaces.

c) Soil depth for planting must be provided as follows:

   a. All areas identified as deep soil planting on the approved landscaped plan must have soil depth no less than 3m.
   b. All planting above structures must have soil depths no less than 500mm.

Plans detailing these amendments are required to be shown on the Construction Certificate plans.
(Reason: Ensure compliance)

3. Section 94A Contributions

Prior to the issue of the Construction Certificate, a monetary contribution of $70,055.64 (subject to indexing as outlined below) is to be paid in accordance with Section 94A of the Environmental Planning and Assessment Act, 1979.

This contribution is based on 1% of the estimated development cost of $7,005,564 at 8 June 2016 and the adopted Section 94A Contributions Plan.

To calculate the monetary contribution that is payable, the proposed cost of development is to be indexed to reflect quantity variations in the Building Price Index (Enterprise Bargaining Agreement) [BPI(EBA)] between the date the proposed cost of development was agreed by the Council and the date the levy is to be paid as required by this Plan.

To calculate the indexed levy, the formula used to determine the cash contribution is set out below.

$$NL = \$Lo + \$Lo \times \frac{[\text{current index} - \text{base index}]}{\text{base index}}$$

Where:

NL	is the new section 94A levy
Lo	is the original levy
Current index [BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works available at the time of review of the contribution rate
Base index [BPI(EBA)]	is the Building Price Index (Enterprise Bargaining Agreement) as published by the NSW Public Works at the date of the proposed cost of development as above

In the event that the current BPI(EBA) is less than the previous BPI(EBA), the current BPI(EBA) shall be taken as not less than the previous BPI(EBA).

Prior to payment Council can provide the value of the indexed levy.

Copies of the S94A Contributions Plan are available for inspection online at www.willoughby.nsw.gov.au
(Reason: Statutory requirement)

4. Services - Energy Australia

The applicant should consult with Energy Australia to determine the need and location of any electrical enclosure for the development. Should such an electrical enclosure be required, the location and dimensions of the structure are to be detailed on all the plans issued with the Construction Certificate. In the event of Energy Australia requiring such a structure eg. a substation, the applicant is required to dedicate the land for the substation as public roadway. The Plan of Dedication shall be lodged to Council prior to issue of the Construction Certificate and registered at the Department of Lands prior to issue of the Occupation Certificate.
(Reason: Compliance)

5. Roof Material – Reflectivity

The external finish to the roof shall be painted or treated in a neutral, recessive non reflective colour range to minimise the effects of glare to neighbouring properties. Roof colour details being submitted with the construction certificate application for approval.
(Reason: Amenity)

6. Adaptable Units

Adaptable residential units for disabled persons are to be provided consistent with the approved plans and supporting Accessibility Assessment Report prepared by Metropolitan Building Approval (Total: 14 Units). Three (3) disabled car spaces are to be nominated on the Construction Certificate drawings and be allocated to the adaptable unit as required under the Willoughby Development Control Plan Part C.6 – Access, Mobility and Adaptability.
(Reason: Access, Mobility and Adaptability)

7. Agreement to Transfer Affordable Housing Dwellings

The applicant must enter into a Deed with the Council providing for the transfer of title of the affordable housing dwelling (identified as Unit G02 on the approved plans with a gross floor area of 72m^2) to the Council, free of charge. The Deed is to be generally in accordance with the Housing Transfer Deed template available at Council and is to be submitted to the Council and executed prior to the issue of the Construction Certificate.

The terms of this agreement must be to the satisfaction of the Council and must include a provision to the effect that the transfer of the dwellings is to be completed within two months of the registration of any subdivision of the development creating the areas to be dedicated and within 6 months of the issue of an Occupation Certificate. The applicant must agree to pay the Council's reasonable legal costs in satisfying itself that the agreement is appropriate, and a provision to this effect is to be included in the agreement.

The construction certificate plans should demonstrate that the physical requirements specified in the Housing Transfer Deed are satisfied.
(Reason: Ensure compliance)

8. Affordable Housing Fittings and Finishes

Prior to the issue of the Construction Certificate, the applicant is to submit to the Council details of all internal fittings and finishes of the affordable housing dwellings. The applicant is responsible for obtaining written confirmation from Council that it is satisfied that the internal fittings and finishes are at the same standard as other dwellings within the development.
(Reason: Amenity)

9. Damage Deposit

The applicant shall lodge a Damage Deposit of $40,000 (GST Exempt) as cash, cheque or an unconditional bank guarantee, to Council against possible damage to Council's asset during the course of the building works. The deposit will be refundable subject to inspection by Council after the completion of all works relating to the proposed development. For the purpose of inspections carried out by Council Engineers, an inspection fee of $220 (GST Exempt) is payable to Council. Any damages identified by Council shall be restored by the applicant prior to release of the Damage Deposit.
(Reason: Protection of public asset)

10. Stormwater Conveyed to Street Drainage

Stormwater runoff from the site shall be collected and conveyed to the street drainage system in accordance with Council's specifications. Any new drainage pipe connections to street kerb shall be made using a 125mm x 75mm x 4mm thick galvanised Rectangular Hollow Section (RHS) with a grated drainage pit (min. 600mm x 600mm) provided within the property and adjacent to the boundary prior to discharging to the Council's drainage system. All drainage works shall comply with the requirements described in Part C.5 of Council's DCP and Technical Standards. In this regard, full design and construction details showing the method of disposal of surface and roof water from the site shall be shown on the Construction Certificate plans.
(Reason: Stormwater control)

11. Detailed Stormwater Management Plan (SWMP)

Submit for approval by the Certifying Authority, detailed stormwater management plans in relation to the on-site stormwater management and disposal system for the development. The construction drawings and specifications shall be prepared by a suitably qualified and experienced civil engineer and in accordance with the stormwater management plans. All drawings shall comply with Part C.5 of Council's Development Control Plan and Technical Standards, AS3500.3 – *Plumbing and Drainage Code* and National Construction Code.
(Reason: Ensure compliance)

12. Basement Pumpout Drainage System

Prior to the issue of the Construction Certificate, the applicant shall submit, for approval by the Certifying Authority, detailed stormwater management plans in relation to the pump-out drainage system. The construction drawings and specifications, shall be generally in accordance with the approved stormwater management plans with the following requirements:

- The pumpout drainage system shall comprise with two (2) submersible type pumps. The two pumps shall be designed to work on an alternative basis to ensure both pumps receive equal use and neither remains continuously idle.
- Each pump shall have a minimum capacity of 10L/s or shall be based on the flow rate generated from the 1 in 100 year ARI 5-minutes duration storm event of the area draining into the system, whichever is greater.
- An alarm warning device (including signage and flashing strobe light) shall be provided for the pump-out system to advise the occupant of pump failure. The location of the signage and flashing strobe light shall be shown on the stormwater management plans.
- The volume of the pump-out tank shall be designed with a minimum storage capacity equivalent to the runoff volume generated from of the area draining into the tank for the 1 in 100 year ARI 2-hours duration storm event.

All drawings shall be prepared by a suitably qualified and experienced civil engineer and shall comply with Part C.5 of Council's Development Control Plan, AS3500.3 – *Plumbing and Drainage Code* and the National Construction Code.
(Reason: Prevent nuisance flooding)

13. Construction Management Plan (CMP)

Prior to the issue of the Construction Certificate, submit, for approval by the Certifying Authority, detailed Construction Management Plan (CMP). The CMP shall address:

(a) Construction vehicles access to and egress from the site
(b) Parking for construction vehicles
(c) Locations of site office, accommodation and the storage of major materials related to the project
(d) Protection of adjoining properties, pedestrians, vehicles and public assets
(e) Location and extent of proposed builder's hoarding and Work Zones
(f) Tree protection management measures for all protected and retained trees.

(Reason: Compliance)

14. Traffic Management Plan

Prior to issue of the Construction Certificate, a detailed Traffic Management Plan shall be prepared for pedestrian and traffic management and be submitted to the relevant road authority for approval. The plan shall: -

a) Be prepared by a RMS accredited consultant.
b) Be in accordance with the current version of AS1742.3 and its associated handbook; and the RMS's Traffic Control at work site manual.
c) Implement a public information campaign to inform any road changes well in advance of each change. The campaign shall be approved by the Traffic Committee.
d) Nominate a contact person who is to have authority without reference to other persons to comply with instructions issued by Council's Traffic Engineer or the Police.
e) Confine temporary road closures to weekends and off-peak hour times and shall be the subject of approval from Council. Prior to implementation of any road closure during construction, Council shall be advised of these changes and a Traffic Control Plan shall be submitted to Council for approval. This Plan shall include times and dates of changes, measures, signage, road markings and any temporary traffic control measures.

(Reason: Public safety and amenity)

15. Vehicle Access – Engineer's Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on the architectural drawings and the structural drawings, and must make specific reference to the following:

a) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.
a) That a maximum gradient of 5% is provided for the first 6 metres from the property boundary to the basement.
b) That the proposed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,
c) That the headroom clearance of minimum 2.2 metres between the basement floor and any overhead obstruction is provided which complies with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.
d) That the headroom clearance of minimum 2.5 metres is provided to all parking spaces for people with disabilities which complies with Section 2.4 of AS2890.6.
e) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

16. Geotechnical Report

Submit to the accredited certifier a geotechnical engineer's report of the proposed geotechnical works including excavation, piling, and shoring. The report shall specifically address safety issues. A report from the Geotechnical Engineer shall be submitted to Council for record purposes.
(Reason: Safety & Amenity)

17. Design of Works in Public Road (Roads Act Approval)

Prior to issue of any Construction Certificate, the Applicant must submit, for approval by Council as a road authority, full design engineering plans and specifications prepared by a suitably qualified and experienced civil engineer for the following infrastructure works:

- Construction of 1.2 metres footpath (max. 2.5% crossfall) for the full frontage of the site in Walter Street. All Adjustments to public utility services and associated construction works in the nature strip are to be at the full cost to the applicant. Detailed long section and cross sections at 5 metres interval shall be provided.
- Construction of new kerb and gutter for the full frontage of the development site with 5 metres wide road restoration. Detailed long sections and cross-section at 5m interval shall be provided.
- Construction of 6 new vehicular crossings in Walter Street. The design levels at the property boundary shall be in accordance with the driveway long sections.
- The required plans must be designed in accordance with Council's specifications (AUS-SPEC). A minimum of three (3) weeks will be required for Council to assess the *Roads Act* submissions. Early submission is recommended to avoid delays in obtaining a Construction Certificate. For the purpose of inspections carried out by Council Engineers, the corresponding fees set out in Council's current *Fees and Charges Schedule* are payable to Council prior to issue of the approved plans. Approval must be obtained from Willoughby City Council as the road authority under the Roads Act 1993 for any proposed works in the public road prior to the issue of any Construction Certificate.

(Reason: Ensure compliance)

18. Internal Noise Levels Residential

To minimise the noise intrusion from any external noise source, the building shall be designed and constructed to comply with the following criteria with windows and doors closed:

Internal Space	Time Period	Criteria $L_{Aeq\ (period)}$
Living Areas	Any time	40 dB(A)
Sleeping Areas	Day (7am – 10pm)	40 dB(A)
	Night (10pm – 7am)	35 dB(A)

Note:

1. The above criteria does not apply to kitchens, bathrooms, laundries, foyers, hallways, balconies or outdoor areas.

2. The above criteria define the minimum acceptable levels. Buildings may be built to a better than average standard by applying more stringent criteria.

Certification from an appropriately qualified acoustic consultant that the building has been designed to meet this criteria shall be submitted to the Certifying Authority prior to issue of the Construction Certificate.
(Reason: Amenity, environmental compliance and health)

19. Building Ventilation

To ensure that adequate provision is made for ventilation of the building, mechanical and/or natural ventilation shall be provided. These shall be designed in accordance with the provisions of:

a) The National Construction Code:
   i) AS1668.1, AS1668.2 and AS3666.1 as applicable; and/or
   ii) Alterative solution using an appropriate assessment method

Details of all mechanical ventilation and exhaust systems, and certification provided by an appropriately qualified person verifying compliance with these requirements, shall be submitted to the Certifying Authority prior to the issue of the Construction Certificate.
(Reason: Health and compliance)

20. Noise Mechanical Services

To minimise the impact of noise onto residential receivers, all mechanical services shall be designed and installed to ensure ambient noise levels are maintained. Details of the proposed equipment, siting and any attenuation required shall accompany the application for Construction Certificate.
(Reason: Amenity, environmental compliance and health)

PRIOR TO COMMENCEMENT

The following conditions of consent have been imposed to ensure that the administration and amenities relating to the proposed development comply with all relevant requirements. All of these conditions are to be complied with prior to the commencement of any works on site, including demolition.

21. Licensee Details

The name, address and contractor licence number of the licensee who has contracted to carry out the work or the name and permit number of the owner-builder who intends to carry out the work shall be furnished in writing to the Certifying Authority prior to commencement of work.
NB: Should changes be made for the carrying out of the work the Certifying Authority must be immediately informed.
(Reason: Information)

22. Site Management

A site Management Plan shall be submitted to and approved by the Certifying Authority prior to commencement of work. The site management plan shall include the following measures as applicable.

- Details and contact telephone numbers of the owner, builder and developer;
- Location and construction details of protective fencing to the perimeter of the site;
- Location of site storage areas, sheds and equipment;
- Location of stored building materials for construction;
- Provisions for public safety;
- Dust control measures;
- Site access location and construction;
- Details of methods of disposal of demolition materials;
- Protective measurers for tree preservation;
- Provisions for temporary sanitary facilities;
- Location and size of waste containers and bulk bins;
- Soil and Water Management Plans (SWMP); comprising a site plan indicating the slope of land, access controls, location and type of sediment controls and storage/control methods for material stockpiles;
- Construction noise and vibration management.

The site management measures shall be implemented prior to the commencement of any site works and maintained during the construction period. A copy of the approved Site Management Plan shall be conspicuously displayed, maintained on site and be made available to the Certifying Authority/Council officers upon request.
(Reason: Environment protection, public health and safety)

23. Dilapidation Report of Adjoining Properties

Submit a photographic survey and report of the adjoining properties 3 & 11 Walter Street Willoughby, to the Certifying Authority and all owners of these adjoining properties. Such photographic survey and report shall be prepared by a suitably qualified person, detailing the physical condition of these properties, both internal and external including items as walls, ceilings, roof, structural members and other items as necessary.

In the event of a property owner refusing to allow access to carry out the photographic survey, the proponent must demonstrate in writing to the Certifying Authority, and provide a copy to Council, that the purpose of the survey was made clear to the property owner and that reasonable attempts to obtain access were made.
(Reason: Protection of adjoining owners)

24. Dilapidation Report of Council's Property

Submit a dilapidation report including photographic record of Council's property extending to a distance of 50m from the development, detailing the physical condition of items such as, but not exclusively to, the footpath, roadway, nature strip, and any retaining walls.

The developer may be held liable to any recent damage to public infrastructure in the vicinity of the site, where such damage is not accurately recorded under the requirements of this condition prior to the commencement of works. In this regard, the damage deposit lodged by the applicant may be used by Council to repair such damage on Council's property.

This dilapidation report shall be submitted to Council and the Certifying Authority prior to commencement of work.
(Reason: Protection of Council's infrastructure)

25. Permits and Approvals Required

Application is to be made to Council's Infrastructure Services Division for the following approvals and permits as appropriate:-

a) Permit to erect Builder's hoarding where buildings are to be erected or demolished within 3.50m of the street alignment. Applications are to include current fees and are to be received at least 21 days before commencement of the construction.

b) Permit to stand mobile cranes and/or other major plant on public roads. Applications are to include current fees and security deposits and are to be received at least seven days before the proposed use. It should be noted that the issue of such permits may also involve approval from the NSW Police Force and the RTA. A separate written application to work outside normal hours must be submitted for approval.

It should also be noted that, in some cases, the above Permits may be refused and temporary road closures required instead which may lead to longer delays due to statutory advertisement requirements.

c) Permit to open public roads, including footpaths, nature strip, vehicular crossing or for any purpose whatsoever. All applications are to include current fees.

d) Permit to place skip/waste bin on footpath and/or nature strip. (Maximum three (3) days).

e) Permit to work and/or place building materials on footpath and/or nature strip. (Maximum two (2) weeks).

f) Permit to establish Works Zone on Public Roads adjacent to the Development including use of footpath area. Applications must be received by Council at least twenty-one days prior to the zone being required. The application will then be referred to the Council's Local Traffic Committee for approval, which may include special conditions.

g) Permit to construct vehicular crossings over Council's footpath, road or nature strip.

(Reason: Legal requirements)

26. Application for Vehicle crossing

Submit an application with fees to Council for the construction of a plain concrete vehicular crossing.
(Reason: Protection of public asset)

27. Spoil Route Plan

Submit a "to and from" spoil removal route plan to Council prior to the commencement of excavation on the site. Such a route plan should show entry and exit locations of all truck movements.
(Reason: Public amenity)

28. Adjustment to Street Lighting

Consult with utility authorities to determine the requirements of relocation/adjustment of electricity supply and street lighting services fronting the property at Walter Street. Such street lighting shall also conform to Council's standard specifications.
(Reason: Public amenity)

29. Garbage Rooms

Garbage rooms must be large enough to store the generated waste from the approved development as calculated in accordance with Part C.8 of the Willoughby Development Control Plan and allowance should be made for separation of putrescible waste from waste suitable for recycling. The garbage room is not to be smaller than 5000mm x 4000mm, have a 2400mm ceiling height, with a door entry width not less than 2200mm.
(Reason: Ensure compliance)

DURING DEMOLITION, EXCAVATION AND CONSTRUCTION

The following conditions are to be complied with throughout the course of site works including demolition, excavation and construction.

30. Hours of Work

All construction/demolition work relating to this Development Consent within the City, unless varied by an Out of Hours Work Permit, must be carried out only between the hours of 7 am to 5 pm Mondays to Fridays and 7 am to 12 noon on Saturdays. No work is permitted on Sundays or Public Holidays.

An application for an Out of Hours Work Permit to allow variation to these approved hours must be lodged with Council at least 48 hours prior to the proposed commencement of the work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and must be accompanied by the required fee. One (1) permit is required for each variation to the approved working hours within any 24 hour period.

If a variation to these approved hours for multiple or extended periods is sought, an application under Section 96 of the Environmental Planning and Assessment Act 1979 must be lodged with Council at least twenty-one (21) days in advance of the proposed changes to the hours of work. The application must include a statement regarding the reasons for the variation sought, the type of work/s to be carried out, the additional time required, the anticipated impact upon the local amenity and how this will be minimized, and be accompanied by the required fee. Note: This S96 application may require re-notification in some circumstances.
(Reason: Ensure compliance and amenity)

31. Construction Information Sign

A clearly visible all weather sign is required to be erected in a prominent position on the site detailing:

(a) that unauthorised entry to the work site is prohibited;
(b) the excavator's and / or the demolisher's and / or the builder's name;

(c) contact phone number/after hours emergency number;
(d) licence number;
(e) approved hours of site work; and
(f) name, address and contact phone number of the Certifying Authority (if other than Council)

ANY SUCH SIGN IS TO BE REMOVED WHEN THE WORK HAS BEEN COMPLETED.

Council may allow exceptions where normal use of the building/s concerned will continue with ongoing occupation, or the works approved are contained wholly within the building.
(Reason: Ensure compliance)

32. Building Site Fencing

Public access to the site and building works, materials and equipment on the site is to be restricted, when work is not in progress or the site is unoccupied.

A temporary safety fence is to be provided to protect the public, located to the perimeter of the site (unless the site is separated from the adjoining land by an existing structurally adequate fence, having a minimum height of 1.5m). Temporary fences are to have a minimum height of 1.8m and be constructed of cyclone wire or similar with fabric attached to the inside of the fence to provide dust control.

Fences are to be structurally adequate and be constructed in a good and workmanlike manner and the use of poor quality materials or steel reinforcement mesh as fencing is not permissible. All parts of the fence, including the fencing blocks shall be located wholly within the property boundaries.

The public safety provisions and temporary fences must be in place and be maintained throughout construction.
(Reason: Safety)

33. Provide Erosion and Sediment Control

Erosion and sediment control devices shall be provided wholly within the site whilst work is being carried out in order to prevent sediment and silt from site works (including demolition and/or excavation) being conveyed by stormwater into Council's stormwater system natural watercourses, bushland and neighbouring properties. In this regard, all stormwater discharge from the site shall meet the requirements of the Protection of Environment Operations Act 1997 and the Department of Environment, Climate Change and Water guidelines. The control devices are to be maintained in a serviceable condition AT ALL TIMES.
(Reason: Environmental protection)

34. Suitable Screens

Suitable screens and/or barricades shall be erected during demolition and building work and where required by the Certifying Authority to reduce the emission of noise, dust, water effluent or other matter from the site.
(Reason: Maintain amenity to adjoining properties)

35. Suitable Barricades

Suitable barricades shall be erected during building works on Councils footpath and where directed by the Certifying Authority and/or Council to protect pedestrians using the footpath.
(Reason: Public safety)

36. Demolition Work AS 2601-2001

Any demolition must be carried out in accordance with AS 2601 – 2001, *The demolition of structures.*
(Reason: Safety)

37. Suitable Footpath Crossing Provided

Adequate provision is to be made to ensure that a suitable footpath crossing is provided to the site so as to allow safe pedestrian access along the footpath area at all times.
(Reason: Protection of public safety)

38. Wash Down and Shaker Areas

During Demolition, Excavation and Construction, wash down and shaker areas are to be provided with facilities for the collection and treatment of waste water.
(Reason: Environmental protection)

39. Asbestos Sign to be Erected

On sites involving demolition or alterations and additions to building where asbestos cement is being repaired, removed or disposed of a standard commercially manufactured sign not less than 400mm x 300mm containing the words "DANGER ASBESTOS REMOVAL IN PROGRESS" is to be erected in a prominent visible position on the site. The sign is to be erected prior to the commencement of works and is to remain in place until such time as all asbestos cement has been removed from the site to an approved waste facility.
(Reason: Public Health and safety/Ensure compliance)

40. Neighbour Notification of Asbestos Removal

The applicant/builder is to notify the adjoining residents five working days prior to demolition works involving removal of asbestos. Such notification is to be clearly written, giving the date work will commence, Work Cover NSW phone number 131 050, Councils phone number 9777 1000.

This notification is to be placed in the letterbox of every property (including every residential flat or unit) either side and immediately at the rear of the site.
(Reason: Public health)

41. Asbestos Removal

Works involving the removal of asbestos must comply with Councils Policy on handling and disposal of asbestos, and must also comply with the Code of Practice for Safe Removal of Asbestos (National Occupational Health and Safety Commission 2012 (1994).

Demolition is to be carried out in accordance with the applicable provisions of Australian Standard AS 2601 – The Demolition of Structures.
(Reason: Public health and safety/Ensure compliance)

42. Asbestos Disposal

All asbestos laden waste, including bonded or friable asbestos must be disposed of at a waste disposal site approved by the NSW Department of Environment, Climate Change and Water.

Upon completion of the asbestos removal and disposal the applicant must furnish the Certifying Authority with a copy of all receipts issued by the waste disposal site as evidence of proper disposal.
(Reason: Environmental protection/Public health and safety)

43. Survey Certificate

Certification of the following shall be submitted to the Certifying Authority by a registered surveyor:

a) Prior to the construction of footings or first completed floor slab (i.e. prior to pouring of concrete) showing the area of the land, building under construction and boundary setbacks;

b) At each level indicating the level of that floor to Australian Height Datum;

c) At completion indicating the relation of the building and any projections to the boundaries, and that the building has been erected to the levels approved in the Development Application.

(Reason: Ensure compliance)

44. Road and Footpath

Council's footpath, nature strip or roadway not being damaged and shall be kept clear at all times.
(Reason: Maintain public safety)

45. Excavations and Backfilling

All excavations and backfilling associated with the erection or demolition of a building must be executed safely, and must be properly guarded and protected to prevent them from being dangerous to life or property.
(Reason: Safety)

46. Temporary Toilet Facilities

Temporary toilet facilities shall be provided to the satisfaction of the Certifying Authority.

The provision of toilet facilities must be completed before any other work is commenced on site. NOTE: Portable toilet facilities are not permitted to be placed on public areas without prior approval having been obtained from Council.
(Reason: Health and amenity)

47. Sweep & Clean Pavement

Sweep and clean pavement surface adjacent to the ingress and egress points of earth, mud and other materials at all times and in particular at the end of each working day or as directed by Council.
(Reason: Legal requirement)

48. Street Signs

The applicant is responsible for the protection of all regulatory / parking / street signs fronting the property. Any damaged or missing street signs as a consequence of the development and associated construction works are to be replaced at full cost to the applicant.
(Reason: Protection of public assets)

49. OSD System

The applicant shall supply and install OSD tank with a minimum storage volume of 43 m^3 in accordance with the approved stormwater plans, Sydney Water's requirements and Council's DCP and Technical Standards.
(Reason: Ensure compliance and conserve natural resources)

50. Tree Protection

Retain and protect the following trees and vegetation throughout the demolition and construction period: All trees not indicated for removal on the approved plans, unless exempt under relevant planning instruments or legislation.

The above trees must be clearly marked and protection devices in place to prevent soil compaction and machinery damage.

Tree roots greater than 50mm diameter are not to be removed unless approved by a qualified arborist on site. All structures are to bridge roots unless directed by a qualified arborist on site.

Tree protection measures must comply with the Arboricultural Impact Assessment prepared by Lee Hancock Consulting Arborist and AS 4970-2009 Protection of trees on development sites.
(Reason: Tree management)

51. Public Tree Protection

Unless identified by the development consent, no tree roots over 50mm diameter are to be damaged or cut and all structures are to be bridged over such roots.

Should any problems arise with regard to the existing or proposed trees on public land during the construction or bond period, the applicant is to immediately Contact Council's Open Space section and resolve the matter to Council's satisfaction.
(Reason: Tree management)

52. Storage of Materials on Council Land Prohibited

The dumping or storage of building materials, spoil, vegetation, green waste, or any other material in the Council reserve is prohibited.
(Reason: Safety, environmental protection)

53. Waste Classification – Excavation Materials

All materials excavated and removed from the site (fill or natural) shall be classified in accordance with the Environment Protection Authority (EPA) Waste Classification Guidelines prior to being disposed of to a NSW approved landfill or to a recipient site.
(Reason: Environment and health protection)

54. Hazardous Materials – Clearance Certificate

Following completion of the removal of any identified hazardous material associated with demolition works, a clearance certificate shall be issued by an appropriately qualified occupational hygienist and submitted to the Certifying Authority. The clearance certificate shall verify that the site is free from any hazardous materials from the demolished buildings.
(Reason: Health and safety)

55. Importation of Fill

Any material to be imported onto the site for levelling, construction or engineering purposes must satisfy the Office of Environment & Heritage (OEH) requirements for *virgin excavated natural material* (VENM), or *excavated natural material* (ENM). The determination of VENM or ENM must be made by suitable qualified consultant. Pre-certification of the imported material shall be made and details made available to Council upon request.
(Reason: Environment & Health Protection)

56. Dust Control

The following measures must be taken to control the emission of dust:

a) Dust screens must be erected around the perimeter of the site and be kept in good repair for the duration of the work.

b) Any existing accumulation of dust (e.g. in ceiling voids and wall cavities) must be removed using an industrial vacuum cleaner fitted with a high efficiency particulate air (HEPA) filter.

c) All dusty surfaces must be wet down and any dust created must be suppressed by means of a fine water spray. Water used for dust suppression must not be allowed to enter the street or stormwater system.

d) All stockpiles of materials that are likely to generate dust must be kept damp or covered.

e) Demolition work must not be carried out during high winds, which may cause dust to spread beyond the boundaries of the site.

(Reason: Amenity)

57. Construction Noise

Construction noise shall be controlled to comply with the requirements as set out in the EPA Interim Construction Noise Guideline. Noise levels shall not exceed the rated background level by more than 10dB(A) at the most sensitive receiver during the standard construction hours. A noise monitoring plan shall be implemented

during construction. Where noise levels may be exceeded appropriate measures to control excessive noise shall be implemented immediately.
(Reason: Amenity)

PRIOR TO OCCUPATION OF THE DEVELOPMENT

The following conditions of consent must be complied with prior to the issue of an occupation certificate.

58. Section 73 Compliance Certificate

A Section 73 Compliance Certificate under the Sydney Water Act 1994 must be obtained prior to the issue of a Final Occupation Certificate. Application must be made through an authorised Water Servicing Coordinator, for details see Customer Service, Urban Development at www.sydneywater.com.au or telephone 13 20 92.

The Section 73 Certificate must be submitted to the Certifying Authority.
(Reason: Ensure statutory compliance)

59. Street Numbering

Prior to the issue of any Occupation Certificate, written application shall be made to the Geospatial Services Section of Council for the allocation of street numbering for each of the newly created strata lots and/or allotments. Documentary evidence of the allocated numbering issued by Council is to be lodged with the Subdivision Certificate Application and Linen Plans.
(Reason: Ensure compliance with Council street numbering policy)

60. Surface Water Runoff

Surface water runoff from paved areas shall be directed away from neighbouring properties and disposed of to the satisfaction of the Certifying Authority.
(Reason: Health and amenity)

61. Fire Safety Certificate Forwarded to NSW Fire and Rescue

Prior to the issue of the Final Occupation Certificate and upon completion of the building work, a Fire Safety Certificate shall be furnished by the owner to Council, and the owner must cause a copy of the certificate (together with a copy of the current fire safety schedule) to be forwarded to the Commissioner of New South Wales Fire and Rescue, and must cause a further copy of the certificate (together with a copy of the current fire safety schedule) to be prominently displayed in the building in accordance with Clause 172 of the Environmental Planning and Assessment Regulation 2000 in respect to each essential fire safety measure included in the Schedule attached to the Construction Certificate.
(Reason: Safety)

62. Registration of Plan of Consolidation

Prior to the issue of any Occupation Certificate, all individual allotments involved in the development site shall be consolidated into a single allotment and evidence of the registration of the plan of consolidation to be submitted to Council.
(Reason: Ensure compliance)

63. Safer by Design

Prior to the issue of any Occupation Certificate and to minimise the opportunity for crime and in accordance with CPTED principles, the development shall incorporate the following:

i. In order to maintain a safe level of visibility for pedestrians within the development, adequate lighting to AS1158 is to be provided to all common areas including the basement car park, common open space and any common stair access to these areas and pedestrian routes, particularly including the waste storage areas.

   This lighting shall ensure consistency to avoid contrasts between areas of shadow/illumination and preferably be solar powered and with an automatic/timed switching mechanism, motion sensor or equivalent for energy efficiency. Such lighting shall be installed and directed in such a manner so as to ensure that no nuisance is created for surrounding properties or to drivers on surrounding streets. Car parking lighting system is to be controlled by sensors to save energy during periods of no occupant usage.

ii. The ceiling and vertical structures of the basement parking area shall be painted white (or equivalent) in order to ensure good visibility, surveillance and less reliance on artificial lighting lux levels.

iii. The design, installation and maintenance of landscaping (and associated works) within pedestrian routes around the site (and adjacent to mailboxes) shall not impede visibility and clear sight lines along the pedestrian footway from one end to the other.

iv. The means to isolate the residential and commercial components of the building shall be incorporated into the development, including the security keying of lifts and doors and other measures for access control.

v. Walls/screens between balconies shall be designed to avoid foot holes or natural ladders so as to prevent access between balconies/terraces within the development.

vi. Adequate signage within the development to identify facilities, entry/exit points and direct movement within the development.

vii. A small portion of each storage area shall be of solid construction (i.e. Cupboard.

(Reason: Safety and surveillance, energy efficiency, amenity)

64. Services - Electricity Supply and Telecommunication Mains

Prior to the issue of any Occupation Certificate, all existing and proposed electricity supplies and telecommunication mains and services around the perimeter of the site shall be relocated underground to the satisfaction of the relevant utility provider and Willoughby City Council at the full cost of the applicant.
(Reason: Compliance)

65. Services - Mailboxes

Prior to the issue of any Occupation Certificate, all mail boxes provided on site shall comply with the requirements of 'Australia Post' in terms of size, location, numbering and clearing. Details of the requirements can be obtained from Australia Post or from their web site. Letter boxes for adaptable dwellings shall comply with AS 4299 Cl 3.8.
(Reason: Legal)

66. Residential Flat Building - Clothes to be Dried in the Open Air

Prior to the issue of any Occupation Certificate, where provision is made to enable clothes to be dried in the open air, this clothes drying area shall be screened by a fence or landscaping on the sides visible from public areas.
(Reason: Amenity)

67. Residential Flat Building - Service Facilities

Prior to the issue of any Occupation Certificate, the following shall apply to the development:

i. Electricity and telephone lines must be placed underground from the street to the building.

ii. One storage area shall be allocated to each unit.

iii. A master TV antenna or satellite dish is to be provided for the building. This shall suitably screened from view from the street.

iv. All plumbing pipes and installations must be concealed in ducts and not exposed on the external walls of the building and must be adequately soundproofed.

v. Secure bicycle parking facilities shall be provided in accordance with Willoughby Development Control Plan Part C. 4 and designed in accordance with AS2890.3.

(Reason: Ensure compliance, streetscape and amenity)

68. Residential Flat Building - Screening of Rooftop Plant/Structures

Prior to the issue of any Occupation Certificate, any rooftop or exposed structures including lift motor rooms, plant rooms etc., together with air conditioning, ventilation and exhaust systems, shall be suitably screened and integrated with the building in order to ensure a properly integrated overall appearance.
(Reason: Visual amenity)

69. Affordable Housing – Fittings and Finishes

Prior to the issue of any Occupation Certificate, the Certifying Authority must be satisfied that the affordable housing dwellings have the internal fittings and finishes at the same standard as the other dwellings within the development and in accordance with the schedule endorsed by Council.

Any costs associated with bringing the affordable housing dwellings to the standards required are to be borne by the applicant.
(Reason: Amenity)

70. Grated Box Drain

For stormwater control a 325 mm wide grated trench drain with a heavy duty removable galvanised grate is to be provided in front of the garage door/basement parking slab to collect driveway runoff. The trench drain shall be connected to the main drainage system and must have an outlet of minimum diameter 150mm to prevent blockage by silt and debris.
(Reason: Proper disposal of stormwater)

71. On-site Water Management System

The stormwater runoff from the site shall be collected and disposed of via an approved stomwater system in accordance with Sydney Water's requirements, the NSW Code of Practice – Plumbing and Drainage, Council's DCP and Technical Standards. The construction of the stormwater drainage system of the proposed development shall be generally in accordance with the approved design stormwater management plans and Council's specification (AUS-SPEC).
(Reason: Prevent nuisance flooding)

72. Sign for On Site Detention System

An aluminium plaque measuring no less than 400mm x 200mm is to be permanently attached and displayed within the immediate vicinity of the OSD system.

The wording for the plaque shall state "*This is the OSD system required by Willoughby City Council. It is an offence to alter any part of the system without written consent from Council. The registered proprietor shall keep the system in good working order by regular maintenance including removal of debris".*
(Reason: Prevent unlawful alteration)

73. Confined Space Sign

Securely install a standard confined space danger sign in a prominent location within the immediate vicinity of access grate of the OSD system.
(Reason: Safe access to tank)

74. Certification of OSD

Prior to the issue of any Occupation Certificate, a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) shall certify on Council's standard certification form that the as-built OSD system is in accordance with the approved plans and complies with Council's DCP and Technical Standards. Council's standard certification form is available in the appendix of Council's Technical Standard No.2.
(Reason: Legal requirement)

75. Works-As-Executed Plans - OSD

Upon completion of the OSD System, the following shall be submitted to the Certifying Authority:

- Work-as-Executed plans based on the approved stormwater management plans from a registered surveyor to verify that the volume of storage, PSD, water and floor levels are constructed in accordance with design requirements. Any minor changes or variations to the approved plans should be highlighted in red on the approved stormwater plans.
- Engineer's certification of the OSD system together with the completed Council's standard form for On-Site Detention Record of Installation.

(Reason: Record of works)

76. S88B/S88E(3) Instrument

Create Positive Covenant and Restriction on the Use of Land on the Title in favour of Council as the benefiting authority for the as-built OSD system. The standard

wording of the terms of the Positive Covenant and Restriction on the Use of Land are available in Council's Technical Standards.

The above instruments shall be created under Section 88B of the Conveyancing Act 1919 for newly created lots. For an existing lot, the instruments can be created under Section 88E(3) of the Conveyancing Act 1919 using Form 13PC and 13RPA respectively. The relative location of the OSD system, in relation to the building footprint, must be shown on the final plan of subdivision/strata plan or must be shown on the scale sketch, attached as an annexure to the request 13PC and 13RPA forms. The S88B instrument or 13PC/13RPA forms shall be lodged with Council's Standard S88B/S88E Lodgement Form with all supporting documentations listed in the Form. Council's Standard Form is available from Council upon requested.

Documentary evidence of registration of these instruments with the Land and Property Information shall be submitted to the Principal Certifying Authority and Council prior to issue of any Occupation Certificate.
(Reason: Maintenance requirement)

77. Documentary Evidence of Positive Covenant, Engineers Certificate

Prior to the issue of any Occupation Certificate, the following documentary evidence of the completed drainage works shall be submitted to Certifying Authority and Council: -

- Registered Positive Covenant and Restriction on the Use of Land by way of the Title Deed.
- Certification from a suitably qualified and experienced civil engineer (generally CP Eng. Qualification) for the as-built OSD system and/or plumber's certification of the as-built rainwater reuse system.
- Work-as-Executed plans highlighting in red based on the approved stormwater management plans from a registered surveyor for the as-built OSD system and/or rainwater reuse system.

(Reason: Public record)

78. Splay Corner for Fence

In order to ensure adequate sight distances for pedestrians and traffic in the frontage road, the boundary fence shall be designed and constructed by a 2m x 2.5m splay on both sides of the driveway exit.
(Reason: Pedestrian safety)

79. Construction of Kerb & Gutter

Construct new kerb and gutter together with any necessary associated pavement restoration in accordance with Council's specification for the full frontage of the development site for stage 1with associated pavement restoration 3 metre wide in Walter Street.
(Reason: Public amenity)

80. Concrete Footpath

Construct a 1.2 m wide concrete footpath for the full frontage/stage 1 of the development site in Northcote Street. All works shall be carried out in accordance with Council's standard specification and drawings.
(Reason: Public amenity)

81. Vehicular Crossing

Construct a new vehicular crossing including the replacement of the existing layback and/or gutter and any associated road restoration as directed by Council's Engineers. All works shall be carried out in accordance with Council's specification AUS-SPEC C271 and Council's Standard Drawing SD105 - Council Vehicular Footpath Crossing and Kerb and Gutter details and any approved longitudinal sections. A separate application for the crossing including current fees and charges is to be submitted for approval by Council.

The crossing is to be 6 metres wide with no splays and is to be constructed at right angles to the street kerb in plain concrete. The new crossing shall be located no closer than 1 metre from any power pole and 2 metres from any street tree unless otherwise approved by Council. The centreline of the new crossing shall be "in-line" with the centreline of the parking space(s).

For the design levels of the vehicular crossing at the property boundary, the following shall be complied with:

- At back of layback – 100 mm above and parallel to the gutter invert.
- At property boundary – adopt the existing footpath level.

The footpath which forms part of the proposed crossing shall have a maximum crossfall of 2.5%. The nature strip, natural rock face and footpath is to be adjusted for a minimum distance of 4metres on both sides of the crossing to suit the new levels.

The suitability of the grade of driveway inside the property is the sole responsibility of the applicant and the required alignment levels fixed by Council may impact upon these levels.

All adjustments to the nature strip, footpath and/or public utilities' mains and services as a consequence of the development and any associated construction works shall be carried out at the full cost to the Applicant. All driveway grades and transitions must comply with AS/NZS 2890.1.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.
(Reason: Public amenity)

82. Removal of Redundant Crossings

Remove all redundant crossings together with any necessary works and reinstate the footpath, nature strip and kerb and gutter accordingly. Such work shall be carried out in accordance with Council's specification.

Vehicular Crossing Formwork Inspection Sheet shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to issue of any Occupation Certificate.
(Reason: Public amenity)

83. Inspection of Civil Works on Road Reserves

All required road pavement, footpath, kerb and gutter, drainage works and/or any necessary associated works on the road reserve shall be completed in accordance with the Council approved drawings, conditions and specification (AUS-SPEC).

Pursuant to Section 138 of the Roads Act 1993, all works carried out on the road reserve shall be inspected and approved by Council's Engineer. Upon completion, Work-as-Executed drawings prepared by a registered surveyor shall be submitted to Council for record purposes. A completion certificate shall be obtained from Council (attesting to this condition being appropriately satisfied) and submitted to the Certifying Authority prior to the issue of any Occupation Certificate.
(Reason: Ensure compliance)

84. Performance Bond

The Applicant shall lodge with the Council a performance bond of $20,000 against defective public civil works undertaken by the main Contractor for a period of twelve (12) months from the date of the completion certificate issued by Council as the road authority under the Roads Act 1993. The bond shall be lodged in the form of a cash deposit, cheque or unconditional bank guarantee which will be refundable subject to the approval of Council's Engineers at the end of the maintenance period. In this period, the Applicant is liable for any part of the work which fails to achieve the design specifications. Council shall be given full authority to make use of the bond for such restoration works within the maintenance period as deemed necessary.
(Reason: Ensure compliance and specification)

85. Turfing of Nature Strip

In the event of damages to the grass verge during works, trim the strip of land between the property boundary and the road, spread topsoil on top of the trimmed surface and lay approved turfing on the prepared surfaces. The turf shall be protected from vehicular traffic and kept watered until established.
(Reason: Public amenity)

86. Vehicle Access - Construction & Certification

The Applicant shall submit, for approval by the Principal Certifying Authority, certification from a suitably qualified and experienced traffic engineer. This certification must be based on a site inspection of the constructed vehicle access and accommodation areas, with dimensions measurements as necessary, and must make specific reference to the following:

a) That the as-constructed carpark complies with the approved Construction Certificate plans,

a) That a maximum gradient of 5% has been provided for the first 6 metres from the property boundary to the basement.

b) That finished driveway gradients and transitions will not result in the scraping of the underside of cars.

c) All parking spaces are open type with no partitions.

d) That the as-constructed vehicular path and parking arrangements comply in full with AS2890.1 – 2004 in terms of minimum dimensions provided,

e) That the headroom clearance of minimum 2.2 metres has been provided between the basement floor and any overhead obstruction to comply with Section 5.3.1 of AS 2890.1 and Section 2.4 of AS2890.6.

f) That the headroom clearance of minimum 2.5 metres has been provided to all parking spaces for people with disabilities to comply with Section 2.4 of AS2890.6.

g) That the headroom clearance of minimum 4.5 metres has been provided for the loading area for medium rigid vehicles which complies with AS2890.2.
h) Minimum dimensions of 2.4m x 5.4m shared area shall be provided adjacent all disabled parking spaces to comply with AS2890.6. Bollards shall be provided at the location on each shared area specified in AS2890.6 which shall be clearly labelled and shown on plans.

(Reason: Ensure Compliance)

87. Public Tree Maintenance

Prior to the issue of any Occupation Certificate, the applicants arborist or landscape designer is to certify that:

i All trees on public land have been adequately maintained, that there has been no net deterioration in health and condition, and that any remedial work complies with AS 4970-2009 "Protection of trees on development sites" and AS 4373 - 2007 "Pruning of Amenity Trees".

ii All new and replacement public trees are of the required species, container size, planting locations, planting standards, and have been grown and supplied from a recognised nursery complying to NATSPEC 2 Guide, "Specifying Trees", 2003.

(Reason: Tree management, public asset management)

88. Tree Planting

Trees are to be planted in accordance with the following table:

No. Required	Species	Location	Min Pot Size
All trees	As indicated on Landscape Plan Dwg No. LP-01 D dated 03/06/2016 prepared by John Lock & Associates Landscape Architecture	As indicated on the Landscape Plan	As indicated on the Landscape Plan

(Reason: Landscape Amenity)

89. Completion of Landscape Works

Prior to the issue of any Occupation Certificate, the approved landscape works shall be consistent with the approved design, completed to a professional standard, consistent with industry best practice and published standards.

(Reason: Landscape amenity)

90. Public Tree Planting

Plant the following trees on Council land forward of the property:

2 x *Tristaniopsis laurina*

The trees shall:

i. Have a minimum container size of 100 litres and grown to NATSPEC 2 "Guide Specifying Trees", (2003).
ii. Be planted in accordance with WCC Landscape Specification 08/2007 "Street Tree Planting".

iii. Be planted generally in alignment with other street trees and generally as indicated on the landscape plan.

(Reason: Landscape amenity, tree canopy recruitment)

91. Emitted Noise - Air Conditioning

To minimise the impact of noise from the air conditioning unit on the occupants of adjoining residential buildings, the air conditioning system shall be installed so that the noise emitted from the air conditioning system shall be not more than 5dBA above the ambient background noise level measured at the boundaries of the property within the permitted times of use stipulated in the Protection of the *Environment Operations (Noise Control) Regulation 2008.*

Certification from an appropriately qualified acoustic consultant that these design requirements have been met shall be submitted to the Certifying Authority prior to issue of the Final Occupation Certificate for the air conditioning unit.
(Reason: Amenity, environmental compliance and health)

92. Sound Level Output Certification

The sound level output from the equipment installed for the operation of the building shall not exceed 5dBA above the ambient background noise level measured at the boundaries of the property in accordance with the current Environment Protection Authority (EPA) guidelines for noise assessment. Certification of the level of sound output is to be provided by an appropriately qualified acoustical Consultant to the Certifying Authority prior to issue of the Final Occupation Certificate.
(Reason: Amenity)

93. Acoustic Works – Report

To ensure all acoustic work has been completed, certification shall be provided upon completion of the works, accompanied with evidence from suitably qualified and practising acoustic engineer, to the effect that the acoustic attenuation has been carried out in accordance with the acoustic report 20E-16-0060-TRP-455798-3 by ViPAC Envineers & Scientists Ltd dated 7 June 2016 to minimise the noise impact on the noise receivers, inside and surrounding the site.
(Reason: Amenity)

94. Noise Emission – Equipment

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified acoustic engineer certifying that the noise from all sound producing plant, equipment, machinery and/or mechanical ventilation system complies with the relevant noise criteria.
(Reason: Amenity, environmental compliance and health)

95. Certification – Ventilation

Prior to the issue of any Occupation Certificate, certification shall be provided from a suitably qualified mechanical engineer certifying that all work associated with the installation of the mechanical and/or natural ventilation systems has been carried out in accordance with the relevant Australian Standards and or alternative solution.
(Reason: Amenity, environmental compliance and health)

96. Waste & Recycling Room

Prior to the issue of any Occupation Certificate, the waste and recycling container room shall be constructed to comply with all the relevant provisions of Willoughby Development Control Plan and in particular :-

a) The floor being graded and drained to an approved drainage outlet connected to the sewer and having a smooth, even surface, coved at all intersections with walls.

b) The walls being cement rendered to a smooth, even surface and coved at all intersections.

c) Cold water being provided in the room with the outlet located in a position so that it cannot be damaged and a hose fitted with a nozzle being connected to the outlet.

d) An overhead type door being provided to the room having a clear opening of not less than 1.8m.

e) A galvanised steel bump rail at least 50 mm clear of the wall being provided at the height of the most prominent part of the garbage containers.

f) Mobile Waste containers or Bulk Bins must have capacity to store waste volume for the development as calculated in accordance with Part C.8 of the Willoughby Development Control Plan and suitable for connection to the garbage collection vehicle being provided in the room. In addition suitable recycling containers must also be provided in the room.

(Reason: Health and amenity)

ADDITIONAL CONDITIONS

The following conditions have been applied to ensure that the use of the land and/or building is carried out in such a manner that is consistent with the aims and objectives of the planning instrument affecting the land, and relevant legislation.

97. Ground Levels

The finished ground levels external to the building are to be consistent with the development consent and are not to be raised.
(Reason: Ensure compliance)

98. Retaining Walls and Drainage

If the soil conditions require it:
a) retaining walls associated with the erection or demolition of a building or other approved methods of preventing movement of the soil must be provided, and
b) adequate provision must be made for drainage.
(Reason: Safety)

99. Erection Wholly within the Boundaries

All works (with the exception of any works approved under S138 of the Roads Act 1993) including footings, shall be erected wholly within the boundaries of the property.
(Reason: Ensure compliance)

100. Annual Fire Safety Statement

Attention is directed to Clause 177 of the Environmental Planning and Assessment Regulation 2000 regarding the submission of an Annual Fire Safety Statement in relation to each essential fire safety measure implemented in the building or on the land on which the building is situated.
(Reason: Safety)

101. On-site Car Parking

The on-site car parking provision of thirty 35 car parking spaces (including 7 visitor car spaces and 1 car space per residential unit), 1 motorbike space must be physically identified on site with signposted.

Any visitor parking bays required in accordance with Willoughby Development Control Plan Part C.4, are to be grouped together and physically identified by suitable signs and/or pavement and being permanently accessible and reserved for the exclusive use of visitors to the premises.

On any subsequent strata subdivision of the approved development, the car parking spaces of the approved must not be separate allotments, but part allotments and are to be allocated on the following basis 1 car space per residential unit.

All visitor spaces must be part of the common property on any strata subdivision of the approved development.
(Reason: Ensure Compliance)

102. Security Controlled Car Parking

Should any security controlled car parking arrangement be introduced for the residential visitor car spaces, an intercom or similar system is to be used to enable free access and parking for the tenants/visitors.
(Reason: Amenity)

103. Motor Cycle Parking

Prior to the issue of the occupation certificate, at least one motorcycle parking space must be provided for motor cycle parking by the development. The space is to have an area of 1.2 metres x 3 metres.
(Reason: Amenity)

104. Cycle Racks

Prior to the issue of the occupation certificate, the development must provide four(4) bicycle rack and three (3) bicycle lockers for the use of residents/visitors of the approved development.
(Reason: Alternative Transport)

105. Loading and Unloading

All loading and unloading to the development is to be conducted wholly within the site. Under no circumstances are loading/unloading activities to be conducted from vehicles standing kerbside in Walter Street.

A plan of management with safety and traffic control measures must be prepared for any waste management and removalist activities to occur at the site, including any temporary measures to control vehicles entering and exiting the site when a vehicle is obstructed the vehicular entry. Any waste management and removalist activities to occur at the site and obstruct the vehicular entry must be completed within 15 minutes.

The plan of management must be incorporated in any building management plan and or strata management plan for the approved development.
(Reason: Access and amenity)

106. Stormwater Kerb Outlet

New stormwater connection outlets at street kerb shall be made using 125x75x4 galvanised Rectangular Hollow Section (RHS). Where there are multiple outlets required, a minimum distance of 100mm shall separate these outlets. A grated drainage pit (min. 600mm x 600mm) shall be provided within and adjacent to the property boundary prior to discharging to the Council's drainage system.
(Reason: Protection of public asset)

107. Vehicular Access and Garaging

Driveways and vehicular access ramps shall be designed to provide adequate ground clearance to the underside of B99 vehicles. In all respects, the proposed vehicle access and/or parking spaces shall be designed and constructed to comply with the minimum requirements of AS/NZS 2890.1 and Council's standard specification.
(Reason: Vehicular access)

108. Underground Utility Services

Locate and establish the size and levels of all utility services in the footpath and road reserve. Contact "Dial Before You Dig" Service" prior to commencement of any works.

All adjustments to public utilities' mains and services as a consequence of the development and associated construction works shall be at the full cost to the applicant.
(Reason: Protection of utilities)

109. Adjustment to Electricity

All existing and proposed overhead electricity supply mains and other overhead services around the street frontage of the site are to be relocated underground to the specification of Energy Australia and Willoughby City Council at full cost to the applicant.
(Reason: Public amenity)

110. Public Infrastructure Restoration

Prior to the release of the Damage Deposit, any damaged public infrastructure caused as a result of the construction works on the subject site (including damage caused by, but not limited to , delivery vehicles, waste collection, contractors, sub-contractors, concrete delivery vehicles) must be fully repaired in accordance with Council's specification and AUS-SPEC at no cost to Council.
(Reason: Protection of public assets)

111. Trees on Adjoining Properties

No approval is given for the removal or pruning of trees on neighbouring private land.
(Reason: Environmental protection)

112. Noise Control – Offensive Noise

To minimise the noise impact on the surrounding environment, the use of the premises, building services, equipment, machinery and ancillary fittings shall not give rise to an "offensive noise" as defined under the provisions of the Protection of the Environment Operations Act 1997.
(Reason: Amenity)

113. Waste Management

a) Bins must be regularly cleaned (every 3-6 months).
a) Bins must be returned to bin room as soon as practicable after the servicing of the bins.
b) All bins must be presented at the kerbside for collection. The building manager/cleaner is responsible for presenting bins for collection and returning bins to the bin rooms.

(Reason: Health and Amenity)

114. Waste Materials

No waste materials are to be stored outside the approved waste storage area at any time. The garbage receptacles are not to be used for the disposal of any type of liquid waste.
(Reason: Health and amenity)

115. Refuse Collection Point

A suitable refuse collection point, adjacent to the garbage room(s), must be provided within the building envelope. The loading operation, including the movement of garbage receptacle must take place on a level surface away from gradients and vehicle ramps. No waste/recycling is to be placed on the public footpaths, roadways, plazas, reserves or building colonnade areas, at any time. All garbage receptacles must be returned to the garbage storage area within the property after the bins are serviced.
(Reason: Health and amenity)

PRESCRIBED CONDITIONS

The following conditions are prescribed by S80A of the Environmental Planning & Assessment Act for developments involving building work.

116. Compliance with National Construction Code

All building works must be carried out in accordance with the performance requirements of the National Construction Code.
(Reason: Compliance)

117. Support for Neighbouring Buildings

(1) If development involves an excavation that extends below the level of the base of the footings of a building, structure or work (including any structure or work within a road or rail corridor) on an adjoining property, the person having the benefit of the development consent must, at the person's own expense:
   a) protect and support the building, structure or work from possible damage from the excavation, and
   b) if necessary, underpin and support the building, structure or work to prevent any such damage, and
   c) must, at least 7 days before excavating below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation to the owner of the building being erected or demolished.

(2) The owner of the adjoining allotment of land is not liable for any part of the cost of work carried out for the purposes of this clause, whether carried out on the allotment of land being excavated or on the adjoining allotment of land.

(3) In this clause, "allotment of land" includes a public road and any other public place.

(Reason: Safety)

STATUTORY REQUIREMENTS

The following advisory notes are statutory requirements of the Environmental Planning & Assessment Act and the Environmental Planning & Assessment Regulations and are provided to assist applicants

118. Construction Certificate Required

This consent IS NOT an approval to carry out any building works (with the exception of demolition work). A Construction Certificate is required PRIOR TO ANY BUILDING WORKS BEING COMMENCED.

Enquiries regarding the issue of a construction certificate can be made to Council's Customer Service Centre on 9777 1000.
(Reason: Ensure compliance and statutory requirement)

119. Notify Council of Intention to Commence Works

In accordance with the provisions of Clause 81A(2) of the Environmental Planning and Assessment Act 1979 the person having the benefit of the development consent shall appoint a Certifying Authority and give at least 2 days' notice to Council, in writing, of the persons intention to commence the erection of the building.
(Reason: Information and ensure compliance)

120. Occupation Certificate

The building/structure or part thereof shall not be occupied or used until an interim occupation / final occupation certificate has been issued in respect of the building or part.
(Reason: Safety)

Appendix B

Site Photographs

Photographic Log
1-31 Walter Street and 450-462 Willoughby Road
Willoughby NSW

Photograph 1 (22/08/19): View of 462 Willoughby Road. Photograph taken looking north.

Photograph 2 (22/08/19): View of 462 Willoughby Road. Photograph taken looking west.

Photograph 3 (22/08/19): Front yard of 452 Willoughby Road.

Photograph 4 (22/08/19): Front yard of 13 Walter Street.

Photographic Log
1-31 Walter Street and 450-462 Willoughby Road Willoughby NSW

Photograph 5 (22/08/19): Front yard of 9 Walter Street. Monitoring well MW2 visible in the foreground.

Photograph 6 (22/08/19): Front yard of 31 Walter Street.

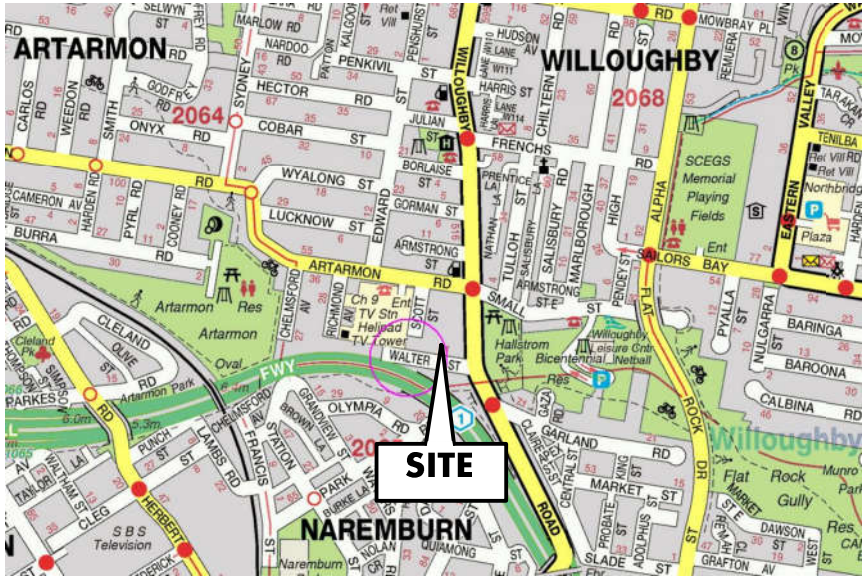
Photograph 7 (22/08/19): Front yard of 15 Walter Street.

Photograph 8 (27/08/19): Back yard at 13A Walter Street.

Appendix C

Historical Report Excerpts

EIS (2017) Preliminary Desktop ESA



N

NOTES:
Figure has been recreated from https://maps.six.nsw.gov.au/ and UBD on disc (version 7.1)

Figure is not to scale. UBD Map ref: 195 Q16

This plan should be read in conjunction with the EIS report

EIS
ENVIRONMENTAL INVESTIGATION SERVICES
www.jkgroup.net.au

SITE LOCATION PLAN

3-31 Walter Street and 462 Willoughby Road, Willoughby

PROJECT ID: E30088KP

FIGURE 1

Approximate location of slag cobble

Sandstone outcropping 2

WALTER STREET

GORE HILL

FREEWAY

FLAT ROCK CREEK

WILLOUGHBY ROAD

RESERVE (UNNAMED & UN-OWNED)

N

This plan should be read in conjunction with the EIS report.

Approximate site boundary

APPROXIMATE SCALE (m):

0 7.5 15 22.5 30 37.5

EIS

ENVIRONMENTAL INVESTIGATION SERVICES

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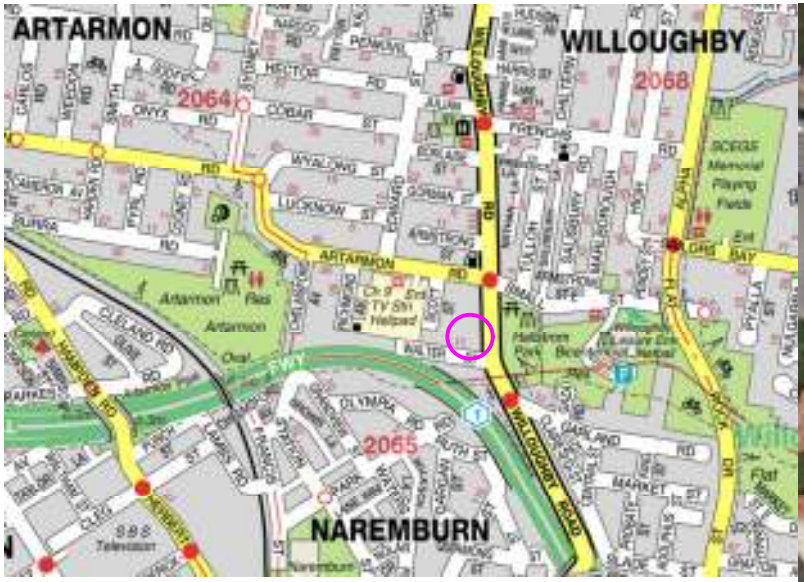
SITE FEATURES PLAN

3-31 Walter Street and 462 Willoughby Road, Willoughby

PROJECT ID: E30088KP

FIGURE 2

EIS (2018) Preliminary ESA



N

NOTES:
Figure has been recreated from https://maps.six.nsw.gov.au/ and UBD on disc (version 7.1)

Figure is not to scale. UBD Map ref: 195 Q16

This plan should be read in conjunction with the EIS report

EIS
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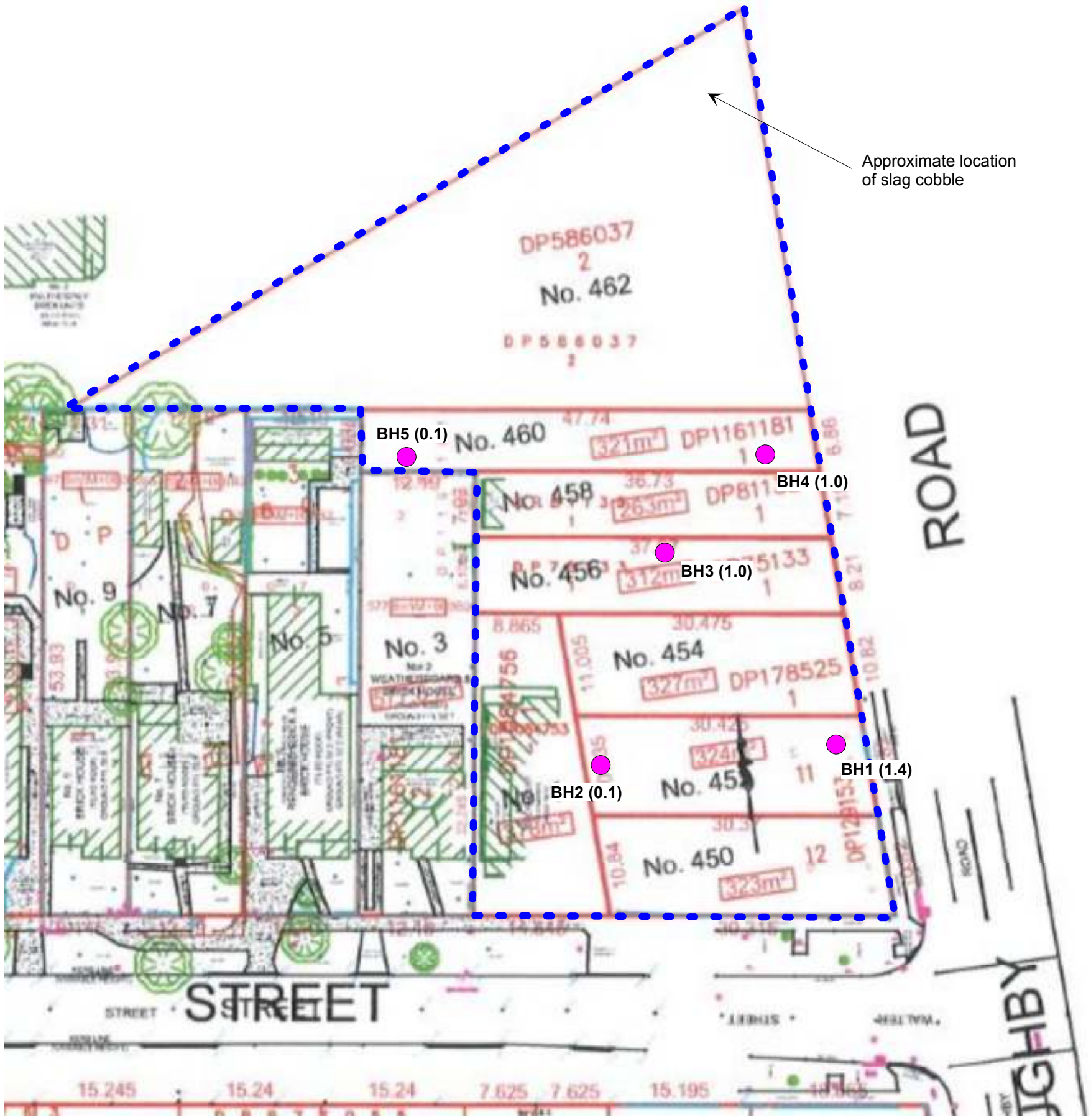
SITE LOCATION PLAN

1-1a Walter Street & 452-462 Willoughby Road, Willoughby

PROJECT ID: E31717KT

FIGURE 1



Approximate site boundary

BH (Fill Depth) Borehole location, number and depth of fill (m) (EIS 2016)

SCALE (m) @ A3: Not to Scale

N

This plan should be read in conjunction with the EIS report.

EIS

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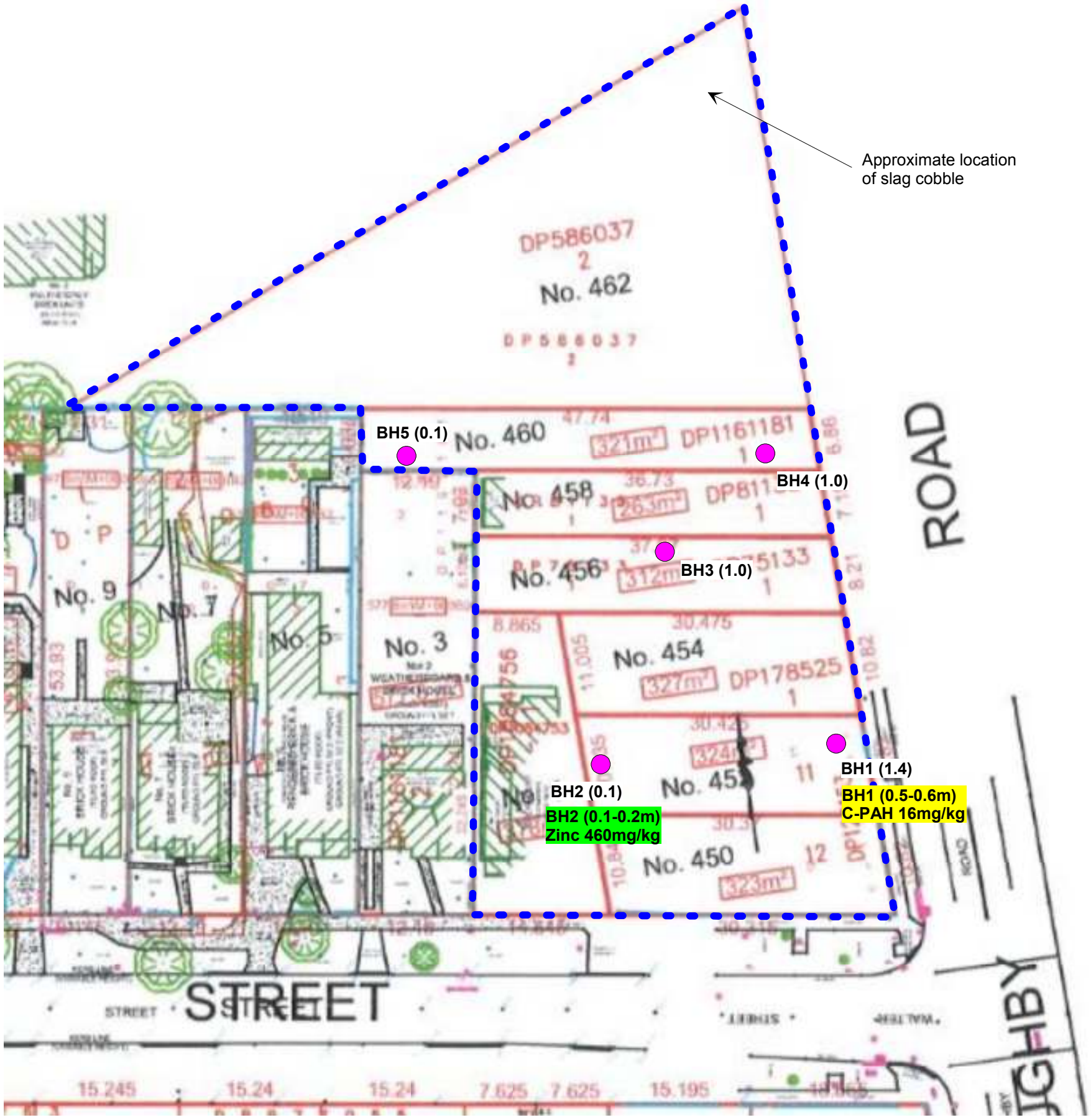
SAMPLE LOCATION PLAN

1-1A Walter Street & 452-462 Willoughby Road, Willoughby

PROJECT ID: E31717KT

F2



Approximate site boundary

BH (Fill Depth) Borehole location, number and depth of fill (m) (EIS 2016)

BH1 (0.5-0.6m) C-PAH 16mg/kg Soil contamination above SAC for human health risk

BH2 (0.1-0.2m) Zinc 460mg/kg Soil contamination above SAC for ecologcial risk

SCALE (m) @ A3: Not to Scale

N

This plan should be read in conjunction with the EIS report.

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CONTAMINATION LOCATION PLAN

1-1A Walter Street & 452-462 Willoughby Road, Willoughby

PROJECT ID: E31717KT

F3

TABLE A

SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.

HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH1	0.5-0.6	Fill	<4	<0.4	11	65	47	0.2	3	110	96	16	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH1	1.2-1.3	Natural	<4	<0.4	9	4	13	<0.1	<1	4	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH2	0.1-0.2	Fill	11	3	14	60	290	0.1	10	460	6.1	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH2	0.4-0.5	Natural	<4	<0.4	9	<1	6	<0.1	<1	2	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH3	0.1-0.2	Fill	<4	<0.4	15	7	8	<0.1	12	13	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH3	0.9-1.0	Natural	<4	<0.4	2	3	6	<0.1	<1	3	0.37	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH4	0.4-0.5	Fill	<4	<0.4	9	12	20	0.1	<1	17	0.93	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH4	1.0-1.1	Natural	<4	<0.4	6	10	12	<0.1	1	9	15	2.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH5	0.2-0.3	Fill	5	<0.4	8	8	21	<0.1	3	48	2.7	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
BH5	0.5-0.6	Natural	<4	<0.4	12	4	5	<0.1	1	62	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Total Number of Samples			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5
Maximum Value			11	3	15	65	290	0.2	12	460	96	16	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC

Concentration above the SAC **VALUE**

TABLE B
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0.5-0.6	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	0.1	0
BH1	1.2-1.3	Natural	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH2	0.1-0.2	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH2	0.4-0.5	Natural	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH3	0.1-0.2	Fill	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH3	0.9-1.0	Natural	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH4	0.4-0.5	Fill	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH4	1.0-1.1	Natural	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH5	0.2-0.3	Fill	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
BH5	0.5-0.6	Natural	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<0.1	0
Total Number of Samples					10	10	10	10	10	10	10	10
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1	<PQL

Concentration above the SAC **VALUE**

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1
NEPM 2013 HSL Land Use Category					**HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH1	0.5-0.6	Fill	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH1	1.2-1.3	Natural	1m to <2m	Sand	70	240	0.5	220	NL	60	NL
BH2	0.1-0.2	Fill	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH2	0.4-0.5	Natural	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH3	0.1-0.2	Fill	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH3	0.9-1.0	Natural	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH4	0.4-0.5	Fill	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH4	1.0-1.1	Natural	1m to <2m	Sand	70	240	0.5	220	NL	60	NL
BH5	0.2-0.3	Fill	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH5	0.5-0.6	Natural	0m to < 1m	Clay	50	280	0.7	480	NL	110	5

TABLE C
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0.5-0.6	Fill	Fine	NA	NA	NA	<4	11	65	47	3	110	0.1	<0.1	<25	<50	380	120	<0.2	<0.5	<1	<1	11
BH1	1.2-1.3	Natural	Coarse	NA	NA	NA	<4	9	4	13	<1	4	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH2	0.1-0.2	Fill	Fine	NA	NA	NA	11	14	60	290	10	460	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.59
BH2	0.4-0.5	Natural	Coarse	NA	NA	NA	<4	9	<1	6	<1	2	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0.1-0.2	Fill	Coarse	NA	NA	NA	<4	15	7	8	12	13	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH3	0.9-1.0	Natural	Coarse	NA	NA	NA	<4	2	3	6	<1	3	<0.1	<0.1	<25	<50	240	<100	<0.2	<0.5	<1	<1	0.09
BH4	0.4-0.5	Fill	Coarse	NA	NA	NA	<4	9	12	20	<1	17	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.1
BH4	1.0-1.1	Natural	Coarse	NA	NA	NA	<4	6	10	12	1	9	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	1.5
BH5	0.2-0.3	Fill	Coarse	NA	NA	NA	5	8	8	21	3	48	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.3
BH5	0.5-0.6	Natural	Fine	NA	NA	NA	<4	12	4	5	1	62	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				0	0	0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Maximum Value				<PQL	<PQL	<PQL	11	15	65	290	12	460	0.1	<PQL	<PQL	<PQL	380	120	<PQL	<PQL	<PQL	<PQL	11

Concentration above the SAC — VALUE

The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-C_{34} (F3)	>C_{34}-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0.5-0.6	Fill	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH1	1.2-1.3	Natural	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH2	0.1-0.2	Fill	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33
BH2	0.4-0.5	Natural	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH3	0.1-0.2	Fill	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH3	0.9-1.0	Natural	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH4	0.4-0.5	Fill	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH4	1.0-1.1	Natural	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH5	0.2-0.3	Fill	Coarse	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	300	2800	50	85	70	105	33
BH5	0.5-0.6	Natural	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	33

TABLE D
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled	PCBs	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0.5-0.6	Fill	LPQL	LPQL	11	65	47	0.2	3	110	96	**11**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	210	230	440	<0.2	<0.5	<1	<1	Not Detected
BH1	1.2-1.3	Natural	LPQL	LPQL	9	4	13	LPQL	LPQL	4	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH2	0.1-0.2	Fill	11	3	14	60	**290**	0.1	10	460	6.1	0.59	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH2	0.4-0.5	Natural	LPQL	LPQL	9	LPQL	6	LPQL	LPQL	2	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH3	0.1-0.2	Fill	LPQL	LPQL	15	7	8	LPQL	12	13	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH3	0.9-1.0	Natural	LPQL	LPQL	2	3	6	LPQL	LPQL	3	0.37	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	270	270	<0.2	<0.5	<1	<1	NA
BH4	0.4-0.5	Fill	LPQL	LPQL	9	12	20	0.1	LPQL	17	0.93	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH4	1.0-1.1	Natural	LPQL	LPQL	6	10	12	LPQL	1	9	15	**1.5**	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
BH5	0.2-0.3	Fill	5	LPQL	8	8	21	LPQL	3	48	2.7	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	Not Detected
BH5	0.5-0.6	Natural	LPQL	LPQL	12	4	5	LPQL	1	62	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<1	NA
Total Number of samples			10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5
Maximum Value			11	3	15	65	290	0.2	12	460	96	11	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	210	270	440	<PQL	<PQL	<PQL	<PQL	NC

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**

TABLE E

SOIL LABORATORY TCLP RESULTS

All data in mg/L unless stated otherwise

			Lead	B(a)P
PQL - Envirolab Services			0.03	0.001
TCLP1 - General Solid Waste			5	0.04
TCLP2 - Restricted Solid Waste			20	0.16
TCLP3 - Hazardous Waste			>20	>0.16
Sample Reference	**Sample Depth**	**Sample Description**		
BH1	0.5-0.6	Fill	NA	<0.001
BH2	0.1-0.2	Fill	0.06	NA
BH4	1.0-1.1	Natural	NA	<0.001
Total Number of samples			1	2
Maximum Value			0.06	<PQL

General Solid Waste	**VALUE**
Restricted Solid Waste	**VALUE**
Hazardous Waste	**VALUE**

TABLE F

SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS

All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH2 (0.1-0.2)	Arsenic	4	11	13	12.0	17
Dup Ref = DUPTC1	Cadmium	0.4	3	3	3.0	0
	Chromium	1	14	20	17.0	35
Envirolab Report: 148608	Copper	1	60	130	95.0	74
	Lead	1	290	650	470.0	77
	Mercury	0.1	0.1	0.4	0.3	120
	Nickel	1	10	13	11.5	26
	Zinc	1	460	590	525.0	25
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.6	0.4	0.5	40
	Anthracene	0.1	0.1	0.1	0.1	0
	Fluoranthene	0.1	1	1	1.0	0
	Pyrene	0.1	1	1	1.0	0
	Benzo(a)anthracene	0.1	0.5	0.4	0.5	22
	Chrysene	0.1	0.6	0.5	0.6	18
	Benzo(b,j+k)fluoranthene	0.2	1	0.9	1.0	11
	Benzo(a)pyrene	0.05	0.59	0.5	0.5	17
	Indeno(123-cd)pyrene	0.1	0.4	0.3	0.4	29
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.4	0.3	0.4	29
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total OPPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	<0.1	<0.1	NC	NC
	TRH C_6-C_{10} (F1)	25	<25	<25	NC	NC
	TRH >C_{10}-C_{16} (F2)	50	<50	<50	NC	NC
	TRH >C_{16}-C_{34} (F3)	100	<100	<100	NC	NC
	TRH >C_{34}-C_{40} (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<1	NC	NC
	o-xylene	1	<1	<2	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable

Results between 5 & 10 times PQL = RPD value <= 75% are acceptable

Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

TABLE G

SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S]
			20/06/2016
	mg/kg	µg/L	mg/kg
Benzene	1	0.2	<0.2
Toluene	1	0.5	<0.5
Ethylbenzene	1	1	<1
m+p-xylene	2	2	<2
o-xylene	1	1	<1

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 1
1/1

Client:

Project:

Location: 1 WALTER STREET, WILLOUGHBY, NSW

Job No. **Method:** HAND AUGER **R.L. Surface:** ≈ 50.1m

Date: 17-6-16 **Datum:** AHD

Logged/Checked by: T.C./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
					REFER TO DCP TEST RESULTS	0			FILL: Silty sand, fine to medium grained, dark grey and dark brown, with roots and root fibres.	M			
									FILL: Sandy clay, low plasticity, orange brown, yellow brown and dark grey, with fine to coarse grained ironstone gravel.				APPEARS POORLY COMPACTED
						0.5							
▶						1							
								SC	CLAYEY SAND: fine to medium grained, grey and brown.	W	VL-L		
						1.5							
								CL	SANDY CLAY: low plasticity, orange brown and grey.	MC≈PL	F-St	100	
						2			END OF BOREHOLE AT 2.0m				
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. **2** 1/1

Client:

Project:

Location: 1 WALTER STREET, WILLOUGHBY, NSW

Job No. **Method:** HAND AUGER **R.L. Surface:** ≈ 50.6m

Date: 17-6-16 **Datum:** AHD

Logged/Checked by: T.C./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLETION	■				REFER TO DCP TEST RESULTS	0			FILL: Clayey sand topsoil, fine to coarse grained, dark brown, with roots.	M			GRASS COVER
								SC	CLAYEY SAND: fine to coarse grained, dark brown.	M	VL-L		
	■					0.5		CL	SANDY CLAY: medium plasticity, light grey.	MC≈PL	F	100 110	
									END OF BOREHOLE AT 0.7m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
						1							
						1.5							
						2							
						2.5							
						3							
						3.5							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 3
1/1

Client:

Project:

Location: 1 WALTER STREET, WILLOUGHBY, NSW

Job No.

Method: HAND AUGER

R.L. Surface: ≈ 50.0m

Date: 17-6-16

Datum: AHD

Logged/Checked by: T.C./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■				REFER TO DCP TEST RESULTS	0			FILL: Clayey silty sand, fine to course grained, dark grey, with root fibres.	M			CONCRETE PAVER
									FILL: Gravelly sand, fine to coarse grained, orange brown and grey, with fine to coarse grained sandstone gravel and sandstone cobbles.				APPEARS POORLY COMPACTED
	■					0.5							
	■					1		SC	CLAYEY SAND: fine to medium grained, dark brown.	M	VL-L		
▶													
	■					1.5			CLAYEY SAND: fine to medium grained, orange brown and light grey.				
						2			END OF BOREHOLE AT 2.0m				
						2.5							
						3							
						3.5							

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BOREHOLE LOG

Borehole No. 4
1/1

Client:

Project:

Location: 1 WALTER STREET, WILLOUGHBY, NSW

Job No.

Method: HAND AUGER

R.L. Surface: ≈ 51.2m

Date: 17-6-16

Datum: AHD

Logged/Checked by: T.C./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	■				REFER TO DCP TEST RESULTS	0			FILL: Sandy clay topsoil, low plasticity, dark grey and brown, with root fibres.	MC≈PL			APPEARS POORLY TO MODERATELY COMPACTED
	■					0.5			FILL: Clayey gravelly sand, fine to coarse grained, orange brown, with fine to coarse grained sandstone gravel and sandstone cobbles.	M			
▶	■					1		SC	CLAYEY SAND: fine to medium grained, brown.	W	VL-L		
	■					1.5			CLAYEY SAND: fine to medium grained, orange brown and grey.				
						2							
						2.5			END OF BOREHOLE AT 2.2m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
						3							
						3.5							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 5
1/1

Client:

Project:

Location: 1 WALTER STREET, WILLOUGHBY, NSW

Job No.

Method: HAND AUGER

R.L. Surface: ≈ 51.6m

Date: 17-6-16

Datum: AHD

Logged/Checked by: T.C./P.S.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
DRY ON COMPLET-ION					REFER TO DCP TEST RESULTS	0			FILL: Silty sand, fine to coarse grained, dark brown, with roots fibres.	M			GRASS COVER
	■							SC	CLAYEY SAND: fine to coarse grained, brown, with root fibres.	M	VL		
▶	■			■		0.5		CL	SANDY CLAY: low to medium plasticity, orange brown and grey.	MC>PL	F	70	
						1			END OF BOREHOLE AT 0.9m				HAND AUGER REFUSAL ON INFERRED SANDSTONE BEDROCK
						1.5							
						2							
						2.5							
						3							
						3.5							

Appendix D

QA/QC Summary

Appendix D – Quality Assurance/Quality Control Program

1 Field QA/QC Evaluation

1.1 Field QA Procedures

To ensure that the data obtained meets the DQIs of precision, accuracy, representativeness, completeness and comparability, the following field procedures and QA measures were implemented as part of the investigation fieldwork:

- Field staff undertaking the fieldwork were appropriately qualified and experience;
- Locations of sampling points were appropriately determined prior to conducting fieldworks to ensure adequate site characterisation, and based on a review of site history;
- Field documentation included the completion of standard field forms including Daily Field Reports documenting the field activities undertaken throughout each day in the field, gauging sheets and purging logs and the use of Chain of Custody (COC) documentation for all field samples;
- Field instruments were maintained in good order and appropriately calibrated and/or challenged in accordance with the manufacturer's instructions prior to conducting fieldworks;
- Soil samples were collected in laboratory supplied washed / certified clean glass 250 mL glass jars with Teflon lined lids. Waterproof labels were affixed to the body of the jars, and included the job number, unique sample identification, and date of sample collection;
- Groundwater samples were collected in laboratory washed / certified bottles appropriate for the analytes tested. Waterproof labels were affixed to the body of the jars, and included the job number, unique sample identification, and date of sample collection;
- Sampling was done in a manner to ensure that any volatile organic compound (VOC) losses were minimal. Immediately after each sample was collected, the vial was sealed with zero headspace to prevent any VOC losses;
- In accordance with AS 4482.1 (2005), soil and groundwater samples were stored in a cool esky containing ice immediately after collection;
- Samples were submitted to the laboratory immediately following fieldwork to ensure that sample holding times could be met. Primary and QA/QC samples were analysed by NATA accredited laboratories by the appropriate analytical methods and LORs; and
- Reusable sampling equipment was decontaminated between sampling locations and new gloves were worn for the collection of each sample to prevent cross contamination.

1.2 Field QA/QC Data Evaluation

1.2.1 Replicate Samples

A QC blind duplicate sample is a sub-sample of the parent sample taken in the field and submitted to the primary laboratory for analysis to enable measurement of the overall precision of the sampling procedure (how representative the result is of the true field conditions) and the precision of the laboratory analytical methods. A QC blind triplicate sample is also a sub-sample of the parent sample taken in the field, but this sample is submitted to a secondary laboratory for analysis to enable assessment of the accuracy of the analytical results between different laboratories.

The primary laboratory for soil and groundwater analyses was Eurofins-mgt in Lane Cove, NSW. The intra-laboratory duplicates were also analysed by Eurofins-mgt. The inter-laboratory duplicates were analysed by ALS Environmental in Smithfield, NSW.

1.2.2 Soil and Groundwater Replicate Data

The soil and groundwater duplicate and triplicate samples collected during the site validation works, and submitted for laboratory testing, are shown in **Table D-1**, below.

Table N-1: Soil and Groundwater Duplicate/Triplicate Summary

Parent Sample	Date	Blind Duplicate	Blind Triplicate	Analysis
Soil				
SB1/MW4_0.2	26/08/2019	QS1	QS1A	TPH/TRH, BTEXN, PAH, metals, asbestos, phenols
SB8_0.1	27/08/2019	QS2	QS2A	TPH/TRH, BTEXN, PAH, metals, phenols
SB21_0.05	27/08/2019	QS3	QS3A	TPH/TRH, BTEXN, PAH, metals
Groundwater				
MW1	2/09/2019	QW1	QW1A	TPH/TRH, BTEXN, PAH, metals, phenols

In total, 41 primary soil samples were analysed for the COPCs at the site (noting that not all COPCs were analysed for each sample), with the duplicate/triplicate samples analysed for the main COPCs comprising BTEXN, TRH, PAHs and metals. This equates to a frequency of at least one soil duplicate per 14 primary samples, and at least one soil triplicate per 14 primary samples.

In total, four primary groundwater samples were analysed for the COPCs at the site, with the duplicate/triplicate samples analysed for TPH/TRH, BTEXN, PAH, metals, phenols. This equates to a frequency of one groundwater duplicate per four primary samples, and one groundwater triplicate per four primary samples.

The overall conducted soil and groundwater sampling frequency was conducted in accordance with the DQIs in **Table 5-2** of the main report.

In order to evaluate the data obtained for the replicate samples, the RPD between replicate and parent samples is calculated using the following equation.

$$\textit{Relative Percentage Difference} = \frac{X^1 - X^2}{\left(\frac{X^1 + X^2}{2}\right)} \times 100$$

Standards AS 4482.1-1997, AS 4482.2-1999, AS/NZ 5667.1-1998, AS/NZ 5667.11-1998 and NEPM (2013) state that replicate and original sample RPDs should generally be within 30%. However, this variation can be expected to be higher for organic compounds than for inorganics. In addition, greater variation is observed where low concentrations of analytes are present. Therefore, the following RPD acceptance criteria were adopted during this DSI:

- Inorganics – 30% RPD;
- Organics – 50% RPD; and
- If primary and/or duplicate concentration <10 × LOR – No Limit.

If replicate RPDs are determined to be outside this range, the reasons and potential impact on site data validity are discussed.

As shown on **Tables 3** (soil) and **8** (water), the RPD between the primary and duplicate/triplicate soil and groundwater samples were within the acceptable ranges or no limit, except for the following:

- Zinc between primary soil sample SB1/MW4_0.2 and the corresponding duplicate sample QS1;
- Lead between primary soil sample SB8_0.1 and the corresponding duplicate sample QS2 and the triplicate sample QS2A;
- Copper between primary soil sample SB8_0.1 and the corresponding triplicate sample QS2A;
- Chromium and zinc between primary soil sample SB21_0.05 and the corresponding duplicate sample QS3; and
- Copper and nickel between primary groundwater sample MW1 and the corresponding duplicate sample QW1.

The RPD exceedances reported in the above soil samples are likely attributable to the heterogeneous nature of the sampled fill materials and the noted zinc RPDs are not considered to affect the outcome of the investigation. Additionally, the highest concentrations reported in the primary, duplicate or triplicate soil samples have been adopted for this investigation.

The reported metals concentrations and RPD exceedances reported in groundwater are likely representative of elevated background levels (with no other COPCs reported at concentrations exceeding the laboratory LORs and/or applicable guideline criteria in groundwater). As all remaining RPDs were reported within acceptance criteria, the reported RPD exceedances are not considered to affect the outcome of the investigation. Additionally, the highest concentrations reported in the primary, duplicate or triplicate groundwater samples have also been adopted for this investigation.

1.2.3 Trip Blank/Trip Spike

Trip blank samples were prepared and transported with primary samples to ensure cross contamination of samples had not occurred during transportation of the samples for the soil and groundwater sampling events. Trip spike samples were also prepared and transported with primary samples to ensure sample integrity and ensure volatile loss had not occurred during the soil and groundwater sampling events.

The trip spike/trip blank analytical results are summarised in **Table 4** (soil trip spikes/blanks) and **Table 9** (groundwater trip spike/blanks). No COPCs were detected at concentrations above the laboratory LORs in any of the trip blanks analysed during the works. The trip spike recoveries were found to be in acceptable ranges for all samples.

1.2.4 Rinsate

The use of rinsate blank samples enables the assessment of potential cross-contamination of the samples during the field handling and are collected during field decontamination procedures by rinsing decontaminated equipment with clean deionised water. Detection of contaminants in a rinsate sample may indicate cross-contamination between sampling locations.

One rinsate water sample was submitted for each day of soil sampling (for a total of three rinsate samples), with analysis of rinsate water associated with the decontaminated hand auger. The rinsate analytical results are summarised in **Table 5**. COPCs were not detected at concentrations exceeding the laboratory LORs in the rinsate blanks and the results indicate the potential for cross contamination of samples from decontaminated equipment was low and decontamination between sampling locations was adequate for the remaining COPCs.

No reusable sampling equipment was used during the groundwater sampling as samples were collected using disposable, single use sampling equipment. Therefore, no rinsate samples were collected during groundwater sampling.

1.2.5 Sample Holding Times

Holding times are the length of time a sample can be stored after collection and prior to analysis without significantly affecting the analytical results. Holding times vary with the analyte, sample matrix, and analytical methodology used to quantify the analytes concentration. A review of the laboratory analytical reports (**Appendix E**) indicates that samples were extracted and/or analysed within the appropriate holding times. Overall, the laboratory results are considered reliable for assessing the sites suitability for the proposed continuing service station land use

1.2.6 Sample Integrity

The COCs and sample receipt documentation received with each sample batch is included with the laboratory reports (**Appendix E**). A review of this documentation indicates that samples were received at the primary and secondary laboratories under chilled conditions at appropriate temperatures.

1.2.7 Sample Containers

A review of the laboratory reports (**Appendix E**) indicates all soil and groundwater samples were submitted to the laboratory in the appropriate containers. Samples for VOC analysis were received in airtight sample containers and with no headspace remaining.

2 Laboratory QA/QC Data Evaluation

2.1 Laboratory Methods

Chemical analysis for all analytes was performed using standard methods by laboratories accredited by the National Association of Testing Authorities, Australia (NATA). The laboratory methods and LORs used by the laboratories for the COPCs analysed are detailed in the laboratory reports (**Appendix E**) and certified by NATA.

The chosen analytical laboratories undertake internal QA/QC procedures that include the analysis of method blanks, internal duplicate samples, laboratory control samples, matrix spikes and surrogate recovery.

2.2 Laboratory Duplicates

A sub-sample is taken by the laboratory from one of the samples submitted and is analysed along with the samples. This measures the precision of the laboratory internal sub-sampling procedures and the analytical procedures. At least one laboratory duplicate is processed per 20 samples. The acceptable RPD laboratory acceptance range is:

- Result > 20 × LOR – < 20% RPD
- Result 10-20 × LOR - <50% RPD
- Result <10 × LOR – No Limit

Laboratory duplicates were within acceptable ranges. The internal laboratory duplicate results are shown on the laboratory reports in **Appendix E**.

2.3 Laboratory Control Spike (LCS)

A sample is spiked with a known concentration of analyte. The amount of spike concentration measured (recovered) after extraction and analysis is recorded and compared to the initial spike concentration. At least one LCS is processed per 20 samples. The LCS assists with measuring the accuracy of the laboratory method employed. In general, the recoveries must lie between 70 – 130%, but differ between analytes.

The LCS sample recoveries were found to be within the acceptance range for all analytes as shown on the laboratory reports in **Appendix E**.

2.4 Surrogate Spikes

Surrogate spikes are added prior to extraction of the sample for all organic analyses (VOCs and SVOCs) except for TRH analysis. The surrogate is a compound that is chemically similar to the compound of interest but does not typically occur in nature (therefore unlikely to occur in the sample). The surrogate is used to assess the analytical process in terms of extraction, recovery, chromatographic resolution and detector response. Low recoveries may be due to matrix interferences and presence of non-target compounds that interfere with detection of the analyte and losses occurring from volatilisation and absorption due to high organic content in the soil. Surrogate spikes are processed when samples are submitted for organic analysis. In general, the recoveries must lie between 50 – 150%, but differ between analytes. The laboratory surrogate spike recoveries were found to be within the acceptance ranges for all samples.

The surrogate recoveries are shown on the laboratory reports in **Appendix E**.

2.5 Laboratory Matrix Spike

A sample is spiked with a known concentration of analyte, and the amount of spike concentration measured (recovered) after extraction and analysis is recorded and compared to the initial spiked concentration. At least one matrix spike is processed per 20 samples. Laboratory matrix spikes assist with measuring the effect of the sample matrix on the analysis, and the potential loss of the analyte during the analytical procedure. In general, recoveries must lie between 70 – 130%. The matrix spike recovery limits were generally found to be in acceptable ranges, except for some metals results (as reported in Eurofins laboratory report 673733-S). The laboratory reported that the matrix spike recovery is outside of the recommended acceptance criteria, however, an acceptable recovery was obtained for the LCS indicating a sample matrix. As such, these discrepancies are not considered to affect the outcome of the investigation works.

The laboratory matrix spike summary is shown on the laboratory reports in **Appendix E**.

2.6 Laboratory Blank

A laboratory blank (‘clean’) sample is prepared and analysed along with the submitted samples. At least one laboratory blank is processed per 20 samples. Laboratory blanks assist with identifying the presence of potential cross contamination resulting from laboratory treatment of the samples. Also, they may indicate the presence of contaminants in extraction solvents, or that cleaning of laboratory equipment between samples was insufficient. The results of the laboratory blank, for each COPC analysed, should be concentrations that are less than the laboratory LOR.

The laboratory blanks were not found to have concentrations of COPCs above the laboratory LORs, as shown on the laboratory reports in **Appendix E**.

3 Data Useability

The data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the conditions at the sample locations and that the analytical data can be relied upon for the purpose of the site assessment. It is concluded that overall the quality of the analytical data produced is reliable for the purpose of this investigation.

Gas Calibration Certificate

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument **MX6**
Serial No. **12102NS-018**
Sensors **O2,PID,LEL**

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
			Low	**High**	**TWA**	**STEL**
Sensor	O2	✓	19.5%	23.5%		
	LEL	✓	5.0%	10.0%		
	PID	✓	100ppm	50ppm	10ppm	25ppm
Alarms	Beeper	✓				
	Settings	✓				
Software	Version					
Datalogger	Operation					
Download	Operation					
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and	Certified	Gas bottle	Instrument Reading
O2		20.9%	NATA	Fresh Air	20.9%
LEL		50% LEL Methane	NATA	SY277	48%
PID		92ppm	NATA	SY245	91.8ppm

Calibrated by: **Sen Philip**

Calibration date: **16/08/2019**

Next calibration due: **12/02/2020**

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 18J104330

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of bump test

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		324189	pH 9.64
2. pH 7.00		pH 7.00		330737	pH 6.77
3. pH 4.00		pH 4.00		330734	pH 4.06
4. mV		234mV		325420/325421	233.8mV
5. EC		2.76mS		329027	2.75mS
6. D.O		0.00ppm		329994	0.02ppm
7. Temp		19.8°C		MultiTherm	20.2°C

Calibrated by: **Sarah Lian**

Calibration date: **30/08/2019**

Next calibration due: **29/09/2019**

Oil / Water Interface Meter

Instrument **Interface Meter (30M)**
Serial No. **288043**

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
	above 7.9V	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: **Irisa Yates**

Test date: **15/08/2019**

Next Test due: **11/02/2020**

Appendix E

Laboratory Reports

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: EnviroSampleNSW@eurofins.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: TRACE Environmental	**Contact Name:** Matt Vanderhevden	**Purchase Order :** -	**COC Number :**
Office Address: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW	**Project Manager:** Matt Vanderhevden	**PROJECT Number :** 19.13	**Eurofins | mgt quote ID :**
	Email for results: mvanderhevden@traceenviro.com	**PROJECT Name :** Willoughby DSI	**Data output format:**

Special Directions & Comments :

Please email invoice to accounts@traceenviro.com & Proj Manager

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	B7 - TPH/TRH, BTEXN, PAH, 8 metals	B7A - TPH/TRH, BTEXN, PAH, 8 metals, phenol	B15 - OCP, OPP, PCB	VOCs	Asbestos (quantification - NEPM + WA)	pH	Electrical Conductivity	R21 - NEPM Screen	HOLD
1	SB1/MW4_0.2	26/08/2019	Soil		X	X	X	X	X	X		
2	SB1/MW4_0.5	26/08/2019	Soil	X							X	
3	SB1/MW4_1.0	26/08/2019	Soil									X
4	SB1/MW4_2.0	26/08/2019	Soil									X
5	SB1/MW4_3.0	26/08/2019	Soil									X
6	SB1/MW4_4.0	26/08/2019	Soil									X
7	SB1/MW4_5.0	26/08/2019	Soil									X
8	SB2_0.1	26/08/2019	Soil	X		X		X				
9	SB3_0.1	26/08/2019	Soil	X				X				
10	SB3_0.2	26/08/2019	Soil	X								
11	SB4_0.1	26/08/2019	Soil	X		X	X	X				
12	SB5_0.1	26/08/2019	Soil		X	X		X	X	X		
13	SB5_0.5	26/08/2019	Soil	X								
14	SB6_0.1	27/08/2019	Soil		X	X		X	X	X	X	
15	SB7_0.1	27/08/2019	Soil	X				X				
16	SB7_0.5	27/08/2019	Soil	X								

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

	1LP	250P	125P	ILA	40mL vial	125mL A	Jar	Ba	Sample comments:
1							1	1	
2							1	1	
3							1	1	
4							1	1	
5							1	1	
6							1	1	
7							1	1	
8							1	1	
9							1	1	
10							1	1	
11							1	1	
12							1	1	
13							1	1	
14							1	1	
15							1	1	
16							1	1	

Laboratory Staff

Relinquished By:	**Received By:** Lina D.
Date & Time:	**Date & Time:** 28/08/19 12:10 PM
Signature	**Signature:**

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 3.2°C

Report number: 673733

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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Email: EnviroSampleNSW@eurofins.com.au

☐ **Brisbane**
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Phone: +617 3902 4600
Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: TRACE Environmental	**Contact Name:** Matt Vanderhevden	**Purchase Order :** -	**COC Number :**
Office Address: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW	**Project Manager:** Matt Vanderhevden	**PROJECT Number :** 19.13	**Eurofins | mgt quote ID :**
	Email for results: mvanderhevden@traceenviro.com	**PROJECT Name :** Willoughby DSI	**Data output format:**

Special Directions & Comments :

Please email invoice to accounts@traceenviro.com & Proj Manager

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Analytes

	Sample ID	Date	Matrix	B7 - TPH/TRH, BTEXN, PAH, 8 metals	B7A - TPH/TRH, BTEXN, PAH, 8 metals, phenol	B15 - OCP, OPP, PCB	VOCs	Asbestos (quantification - NEPM + WA)	pH	Electrical Conductivity	R21 - NEPM Screen	HOLD	Containers: 1LP	Jar	Bag	Sample comments:
17	SB8_0.1	27/08/2019	Soil		X	X		X	X	X				1	1	
18	SB8_0.6	27/08/2019	Soil	X										1	1	
19	SB8_1.0	27/08/2019	Soil									X		1	1	
20	SB9_0.1	27/08/2019	Soil	X				X						1	1	
21	SB9_0.6	27/08/2019	Soil									X		1	1	
22	SB10_0.1	27/08/2019	Soil		X	X		X	X	X				1	1	
23	SB10_0.5	27/08/2019	Soil	X							X			1	1	
24	SB11_0.1	27/08/2019	Soil	X		X		X						1	1	
25	SB11_0.6	27/08/2019	Soil	X										1	1	
26	SB12_0.1	27/08/2019	Soil	X		X		X						1	1	
27	SB12_0.4	27/08/2019	Soil	X										1	1	
28	SB13_0.1	27/08/2019	Soil		X	X		X	X	X				1	1	
29	SB13_0.6	27/08/2019	Soil	X										1	1	
30	SB14_0.1	27/08/2019	Soil	X				X						1	1	
31	SB15_0.1	27/08/2019	Soil		X	X		X	X	X				1	1	
32	SB15_0.4	27/08/2019	Soil	X										1	1	

Laboratory Staff

Relinquished By:	**Received By:** Lina D
Date & Time:	**Date & Time:** 28/08/19 12:10 PM
Signature	**Signature:**

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 3,2°C

Report number: 673733

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☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: TRACE Environmental	**Contact Name:** Matt Vanderhevden	**Purchase Order :** -	**COC Number :**
Office Address: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW	**Project Manager:** Matt Vanderhevden	**PROJECT Number :** 19.13	**Eurofins | mgt quote ID :**
	Email for results: mvanderhevden@traceenviro.com	**PROJECT Name :** Willoughby DSI	**Data output format:**

Special Directions & Comments :

Please email invoice to accounts@traceenviro.com & Proj Manager

Eurofins | mgt DI water batch number:

Analytes

	Sample ID	Date	Matrix	B7 - TPH/TRH, BTEXN, PAH, 8 metals	B7A - TPH/TRH, BTEXN, PAH, 8 metals, phenol	B15 - OCP, OPP, PCB	VOCs	Asbestos (quantification - NEPM + WA)	pH	Electrical Conductivity	R21 - NEPM Screen	HOLD
33	SB16_0.1	27/08/2019	Soil	X				X			X	
34	SB16_0.3	27/08/2019	Soil	X								
35	SB17_0.1	27/08/2019	Soil		X	X	X	X	X	X		
36	SB18_0.1	27/08/2019	Soil	X				X				
37	SB18_0.5	27/08/2019	Soil	X								
38	SB18_1.0	27/08/2019	Soil									X
39	SB19_0.1	27/08/2019	Soil	X				X				
40	SB20_0.1	27/08/2019	Soil		X	X		X	X	X	X	
41	SB21_0.05	27/08/2019	Soil	X				X				
42	SB21_0.1	27/08/2019	Soil	X								
43	SB22_0.05	27/08/2019	Soil		X	X	X	X	X	X	X	
44	SB2?_0.6	27/08/2019	Soil									X
45	SB23_0.1	27/08/2019	Soil	X			X	X				
46	SB23_0.5	27/08/2019	Soil	X								
47	QS1	26/08/2019	Soil		X			X				
48	QS2	27/08/2019	Soil		X							

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40ml, vial	125ml, A	Jar	Bag
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1
						1	1

Sample comments:

Laboratory Staff

Relinquished By:

Date & Time:

Signature

Received By: Lina D

Date & Time: 28/08/19 12:10 PM

Signature:

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # :

Temperature on arrival: 3.2°C

Report number: 673733

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☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
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Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: TRACE Environmental	**Contact Name:** Matt Vanderhevden	**Purchase Order :** -	**COC Number :**
Office Address: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW	**Project Manager:** Matt Vanderhevden	**PROJECT Number :** 19.13	**Eurofins | mgt quote ID :**
	Email for results: mvanderhevden@traceenviro.com	**PROJECT Name :** Willoughby DSI	**Data output format:**

Special Directions & Comments :
Please email invoice to accounts@traceenviro.com & Proj Manager

Eurofins | mgt DI water batch number:

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

	Sample ID	Date	Matrix	B7 - TPH/TRH, BTEXN, PAH, 8 metals	B7A - TPH/TRH, BTEXN, PAH, 8 metals, phenol	B15 - OCP, OPP, PCB	VOCs	Asbestos (quantification - NEPM + WA)	pH	Electrical Conductivity	R21 - NEPM Screen	vTPH/BTEXN	HOLD	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar	Bag	Sample comments:
49	QS3	27/08/2019	Soil	X																1	1	
50	RB1	26/08/2019	Water		X													2				
51	RB2	27/08/2019	Water		X													2				
52	RB3	28/08/2019	Water		X													2				
53	TS1	28/08/2019	Soil									X						1				
54	TB1	28/08/2019	Soil									X						1				
55	SB24_0.1	28/08/2019	Soil	X		X		X												1	1	
56	SB24_0.5	28/08/2019	Soil	X																1	1	
57	SB24_0.8	28/08/2019	Soil										X							1	1	
58	SB25_0.1	28/08/2019	Soil	X				X												1	1	
59	SB25_0.6	28/08/2019	Soil										X							1	1	
60	SB26_0.1	28/08/2019	Soil	X				X												1	1	
61																						
62																						
63																						
64																						

Laboratory Staff

Relinquished By:	**Received By:** Lina D.
Date & Time:	**Date & Time:** 28/08/19 12:10 PM
Signature	**Signature:**

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐
5 DAY ☑ 10 DAY ☐ Other:

Method Of Shipment

☐ Courier
☐ Hand Delivered
☐ Postal
Courier Consignment # :

Temperature on arrival: 3.2°C

Report number: 673733

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Melbourne
6 Monterey Road
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Site # 1254 & 14271

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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

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

Sample Receipt Advice

Company name:	**Trace Environmental P/L**
Contact name:	Matthew Vanderheyden
Project name:	WILLOUGHBY DSI
Project ID:	19.13
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Aug 28, 2019 12:10 PM
Eurofins reference:	**673733**

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 Sample Receipt : 3.2 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.
- ☒ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

Extra Jar and Bag received for sample "SB3/0.1A", analysis placed on hold.

Contact notes

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

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Matthew Vanderheyden - mvanderheyden@traceenviro.com.

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

Melbourne
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	SB1/MW4_0.2	Aug 26, 2019		Soil	S19-Au41167	X	X			X	X	X	X			X	
2	SB1/MW4_0.5	Aug 26, 2019		Soil	S19-Au41168								X	X	X		
3	SB2_0.1	Aug 26, 2019		Soil	S19-Au41169	X	X				X		X		X		
4	SB3_0.1	Aug 26, 2019		Soil	S19-Au41170	X							X		X		
5	SB3_0.2	Aug 26, 2019		Soil	S19-Au41171								X		X		
6	SB4_0.1	Aug 26, 2019		Soil	S19-Au41172	X					X	X	X		X		
7	SB5_0.1	Aug 26, 2019		Soil	S19-Au41173	X	X			X	X		X			X	
8	SB5_0.5	Aug 26, 2019		Soil	S19-Au41174								X		X		
9	SB6_0.1	Aug 27, 2019		Soil	S19-Au41175	X				X	X		X	X		X	

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

Melbourne
6 Monterey Road
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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
10	SB7_0.1	Aug 27, 2019		Soil	S19-Au41176	X							X		X		
11	SB7_0.5	Aug 27, 2019		Soil	S19-Au41177								X		X		
12	SB8_0.1	Aug 27, 2019		Soil	S19-Au41178	X	X			X	X		X			X	
13	SB8_0.6	Aug 27, 2019		Soil	S19-Au41179								X		X		
14	SB9_0.1	Aug 27, 2019		Soil	S19-Au41180	X	X						X		X		
15	SB10_0.1	Aug 27, 2019		Soil	S19-Au41181	X	X			X	X		X			X	
16	SB10_0.5	Aug 27, 2019		Soil	S19-Au41182								X	X	X		
17	SB11_0.1	Aug 27, 2019		Soil	S19-Au41183	X					X		X		X		
18	SB11_0.6	Aug 27, 2019		Soil	S19-Au41184								X		X		
19	SB12_0.1	Aug 27, 2019		Soil	S19-Au41185	X					X		X		X		
20	SB12_0.4	Aug 27, 2019		Soil	S19-Au41186								X		X		
21	SB13_0.1	Aug 27, 2019		Soil	S19-Au41187	X	X			X	X		X			X	

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NATA # 1261 Site # 20794

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
22	SB13_0.6	Aug 27, 2019		Soil	S19-Au41188								X		X		
23	SB14_0.1	Aug 27, 2019		Soil	S19-Au41189	X							X		X		
24	SB15_0.1	Aug 27, 2019		Soil	S19-Au41190	X	X			X	X		X			X	
25	SB15_0.4	Aug 27, 2019		Soil	S19-Au41191								X		X		
26	SB16_0.1	Aug 27, 2019		Soil	S19-Au41192	X							X	X	X		
27	SB16_0.3	Aug 27, 2019		Soil	S19-Au41193								X		X		
28	SB17_0.1	Aug 27, 2019		Soil	S19-Au41194	X	X			X	X	X	X			X	
29	SB18_0.1	Aug 27, 2019		Soil	S19-Au41195	X							X		X		
30	SB18_0.5	Aug 27, 2019		Soil	S19-Au41196								X		X		
31	SB19_0.1	Aug 27, 2019		Soil	S19-Au41197	X							X		X		
32	SB20_0.1	Aug 27, 2019		Soil	S19-Au41198	X				X	X		X	X		X	
33	SB21_0.05	Aug 27, 2019		Soil	S19-Au41199	X							X		X		

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Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
34	SB21_0.1	Aug 27, 2019		Soil	S19-Au41200								X		X		
35	SB22_0.05	Aug 27, 2019		Soil	S19-Au41201	X				X	X	X	X	X		X	
36	SB23_0.1	Aug 27, 2019		Soil	S19-Au41202	X						X	X		X		
37	SB23_0.5	Aug 27, 2019		Soil	S19-Au41203								X		X		
38	QS1	Aug 26, 2019		Soil	S19-Au41204	X							X			X	
39	QS2	Aug 27, 2019		Soil	S19-Au41205								X			X	
40	QS3	Aug 27, 2019		Soil	S19-Au41206								X		X		
41	RB1	Aug 26, 2019		Water	S19-Au41207											X	
42	RB2	Aug 27, 2019		Water	S19-Au41208											X	
43	RB3	Aug 28, 2019		Water	S19-Au41209											X	
44	TS1	Aug 28, 2019		Soil	S19-Au41210												X
45	TB1	Aug 28, 2019		Soil	S19-Au41211												X

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
46	LAB SPIKE	Aug 28, 2019		Soil	S19-Au41212												X
47	SB24_0.1	Aug 28, 2019		Soil	S19-Au41213	X					X		X		X		
48	SB24_0.5	Aug 28, 2019		Soil	S19-Au41214								X		X		
49	SB25_0.1	Aug 28, 2019		Soil	S19-Au41215	X							X		X		
50	SB26_0.1	Aug 28, 2019		Soil	S19-Au41216	X							X		X		
51	SB1/MW4_1.0	Aug 26, 2019		Soil	S19-Au41256				X								
52	SB1/MW4_2.0	Aug 26, 2019		Soil	S19-Au41257				X								
53	SB1/MW4_3.0	Aug 26, 2019		Soil	S19-Au41258				X								
54	SB1/MW4_4.0	Aug 26, 2019		Soil	S19-Au41259				X								
55	SB1/MW4_5.0	Aug 26, 2019		Soil	S19-Au41260				X								
56	SB8_1.0	Aug 27, 2019		Soil	S19-Au41261				X								
57	SB9_0.6	Aug 27, 2019		Soil	S19-Au41262				X								

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Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
58	SB18_1.0	Aug 27, 2019		Soil	S19-Au41263				X								
59	SB22_0.6	Aug 27, 2019		Soil	S19-Au41264				X								
60	SB24_0.8	Aug 28, 2019		Soil	S19-Au41265				X								
61	SB25_0.6	Aug 28, 2019		Soil	S19-Au41266				X								
62	SB3/0.1A	Aug 26, 2019		Soil	S19-Au41619			X									
Test Counts						27	9	12	12	10	15	5	44	6	32	15	3

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.

Trace Environmental P/L
Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Attention:	Matthew Vanderheyden
Report	673733-AID
Project Name	WILLOUGHBY DSI
Project ID	19.13
Received Date	Aug 28, 2019
Date Reported	Sep 04, 2019

Methodology:

Asbestos Fibre Identification	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. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter 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) is employed. *NOTE: 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 for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name WILLOUGHBY DSI
Project ID 19.13
Date Sampled Aug 26, 2019 to Aug 28, 2019
Report 673733-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SB1/MW4_0.2	19-Au41167	Aug 26, 2019	Approximate Sample 628g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB2_0.1	19-Au41169	Aug 26, 2019	Approximate Sample 751g Sample consisted of: Brown coarse-grained sandy soil and rocks	ACM: Chrysotile asbestos detected in fibre cement fragment. Approximate raw weight of ACM = 0.0g Total estimated asbestos content in ACM = 7.5g* Total estimated asbestos concentration in ACM = 1.0% w/w* Organic fibre detected. No trace asbestos detected.
SB3_0.1	19-Au41170	Aug 26, 2019	Approximate Sample 737g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB4_0.1	19-Au41172	Aug 26, 2019	Approximate Sample 542g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB5_0.1	19-Au41173	Aug 26, 2019	Approximate Sample 476g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB6_0.1	19-Au41175	Aug 27, 2019	Approximate Sample 634g Sample consisted of: Brown coarse-grained sandy soil, brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB7_0.1	19-Au41176	Aug 27, 2019	Approximate Sample 634g Sample consisted of: Brown coarse-grained sandy soil, fragments of brick and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SB8_0.1	19-Au41178	Aug 27, 2019	Approximate Sample 482g Sample consisted of: Brown coarse-grained sandy soil, fragments of brick, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB9_0.1	19-Au41180	Aug 27, 2019	Approximate Sample 603g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB10_0.1	19-Au41181	Aug 27, 2019	Approximate Sample 580g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB11_0.1	19-Au41183	Aug 27, 2019	Approximate Sample 611g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB12_0.1	19-Au41185	Aug 27, 2019	Approximate Sample 612g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB13_0.1	19-Au41187	Aug 27, 2019	Approximate Sample 458g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB14_0.1	19-Au41189	Aug 27, 2019	Approximate Sample 482g Sample consisted of: Brown coarse-grained sandy soil and rocks.	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB15_0.1	19-Au41190	Aug 27, 2019	Approximate Sample 461g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB16_0.1	19-Au41192	Aug 27, 2019	Approximate Sample 384g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB17_0.1	19-Au41194	Aug 27, 2019	Approximate Sample 549g Sample consisted of: Brown coarse-grained soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB18_0.1	19-Au41195	Aug 27, 2019	Approximate Sample 388g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB19_0.1	19-Au41197	Aug 27, 2019	Approximate Sample 398g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB20_0.1	19-Au41198	Aug 27, 2019	Approximate Sample 564g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SB21_0.05	19-Au41199	Aug 27, 2019	Approximate Sample 299g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB22_0.05	19-Au41201	Aug 27, 2019	Approximate Sample 268g Sample consisted of: Brown coarse-grained soil, cement and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB23_0.1	19-Au41202	Aug 27, 2019	Approximate Sample 372g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
QS1	19-Au41204	Aug 26, 2019	Approximate Sample 653g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB24_0.1	19-Au41213	Aug 28, 2019	Approximate Sample 510g Sample consisted of: Brown coarse-grained sandy soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB25_0.1	19-Au41215	Aug 28, 2019	Approximate Sample 286g Sample consisted of: Dark brown coarse-grained soil, glass and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SB26_0.1	19-Au41216	Aug 28, 2019	Approximate Sample 566g Sample consisted of: Brown coarse-grained sandy soil, rocks and fragment of brick	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

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.

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	Aug 28, 2019	Indefinite

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Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	SB1/MW4_0.2	Aug 26, 2019		Soil	S19-Au41167	X	X			X	X	X	X			X	
2	SB1/MW4_0.5	Aug 26, 2019		Soil	S19-Au41168								X	X	X		
3	SB2_0.1	Aug 26, 2019		Soil	S19-Au41169	X	X				X		X		X		
4	SB3_0.1	Aug 26, 2019		Soil	S19-Au41170	X							X		X		
5	SB3_0.2	Aug 26, 2019		Soil	S19-Au41171								X		X		
6	SB4_0.1	Aug 26, 2019		Soil	S19-Au41172	X					X	X	X		X		
7	SB5_0.1	Aug 26, 2019		Soil	S19-Au41173	X	X			X	X		X			X	
8	SB5_0.5	Aug 26, 2019		Soil	S19-Au41174								X		X		
9	SB6_0.1	Aug 27, 2019		Soil	S19-Au41175	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
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
10	SB7_0.1	Aug 27, 2019		Soil	S19-Au41176	X							X		X		
11	SB7_0.5	Aug 27, 2019		Soil	S19-Au41177								X		X		
12	SB8_0.1	Aug 27, 2019		Soil	S19-Au41178	X	X			X	X		X			X	
13	SB8_0.6	Aug 27, 2019		Soil	S19-Au41179								X		X		
14	SB9_0.1	Aug 27, 2019		Soil	S19-Au41180	X	X						X		X		
15	SB10_0.1	Aug 27, 2019		Soil	S19-Au41181	X	X			X	X		X			X	
16	SB10_0.5	Aug 27, 2019		Soil	S19-Au41182								X	X	X		
17	SB11_0.1	Aug 27, 2019		Soil	S19-Au41183	X					X		X		X		
18	SB11_0.6	Aug 27, 2019		Soil	S19-Au41184								X		X		
19	SB12_0.1	Aug 27, 2019		Soil	S19-Au41185	X					X		X		X		
20	SB12_0.4	Aug 27, 2019		Soil	S19-Au41186								X		X		
21	SB13_0.1	Aug 27, 2019		Soil	S19-Au41187	X	X			X	X		X			X	

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Site # 1254 & 14271

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NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
22	SB13_0.6	Aug 27, 2019		Soil	S19-Au41188								X		X		
23	SB14_0.1	Aug 27, 2019		Soil	S19-Au41189	X							X		X		
24	SB15_0.1	Aug 27, 2019		Soil	S19-Au41190	X	X			X	X		X			X	
25	SB15_0.4	Aug 27, 2019		Soil	S19-Au41191								X		X		
26	SB16_0.1	Aug 27, 2019		Soil	S19-Au41192	X							X	X	X		
27	SB16_0.3	Aug 27, 2019		Soil	S19-Au41193								X		X		
28	SB17_0.1	Aug 27, 2019		Soil	S19-Au41194	X	X			X	X	X	X			X	
29	SB18_0.1	Aug 27, 2019		Soil	S19-Au41195	X							X		X		
30	SB18_0.5	Aug 27, 2019		Soil	S19-Au41196								X		X		
31	SB19_0.1	Aug 27, 2019		Soil	S19-Au41197	X							X		X		
32	SB20_0.1	Aug 27, 2019		Soil	S19-Au41198	X				X	X		X	X		X	
33	SB21_0.05	Aug 27, 2019		Soil	S19-Au41199	X							X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
34	SB21_0.1	Aug 27, 2019		Soil	S19-Au41200								X		X		
35	SB22_0.05	Aug 27, 2019		Soil	S19-Au41201	X				X	X	X	X	X		X	
36	SB23_0.1	Aug 27, 2019		Soil	S19-Au41202	X						X	X		X		
37	SB23_0.5	Aug 27, 2019		Soil	S19-Au41203								X		X		
38	QS1	Aug 26, 2019		Soil	S19-Au41204	X							X			X	
39	QS2	Aug 27, 2019		Soil	S19-Au41205								X			X	
40	QS3	Aug 27, 2019		Soil	S19-Au41206								X		X		
41	RB1	Aug 26, 2019		Water	S19-Au41207											X	
42	RB2	Aug 27, 2019		Water	S19-Au41208											X	
43	RB3	Aug 28, 2019		Water	S19-Au41209											X	
44	TS1	Aug 28, 2019		Soil	S19-Au41210												X
45	TB1	Aug 28, 2019		Soil	S19-Au41211												X

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
46	SB24_0.1	Aug 28, 2019		Soil	S19-Au41213	X					X		X		X		
47	SB24_0.5	Aug 28, 2019		Soil	S19-Au41214								X		X		
48	SB25_0.1	Aug 28, 2019		Soil	S19-Au41215	X							X		X		
49	SB26_0.1	Aug 28, 2019		Soil	S19-Au41216	X							X		X		
50	SB1/MW4_1.0	Aug 26, 2019		Soil	S19-Au41256				X								
51	SB1/MW4_2.0	Aug 26, 2019		Soil	S19-Au41257				X								
52	SB1/MW4_3.0	Aug 26, 2019		Soil	S19-Au41258				X								
53	SB1/MW4_4.0	Aug 26, 2019		Soil	S19-Au41259				X								
54	SB1/MW4_5.0	Aug 26, 2019		Soil	S19-Au41260				X								
55	SB8_1.0	Aug 27, 2019		Soil	S19-Au41261				X								
56	SB9_0.6	Aug 27, 2019		Soil	S19-Au41262				X								
57	SB18_1.0	Aug 27, 2019		Soil	S19-Au41263				X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
58	SB22_0.6	Aug 27, 2019		Soil	S19-Au41264				X								
59	SB24_0.8	Aug 28, 2019		Soil	S19-Au41265				X								
60	SB25_0.6	Aug 28, 2019		Soil	S19-Au41266				X								
61	SB3/0.1A	Aug 26, 2019		Soil	S19-Au41619			X									
Test Counts						27	9	12	12	10	15	5	44	6	32	15	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. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. 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	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

S19-Au41173, S19-Au41178, S19-Au41187, S19-Au41189, S19-Au41190, S19-Au41192, S19-Au41194, S19-Au41195, S19-Au41197, S19-Au41199, S19-Au41201, S19-Au41202, S19-Au41215: Samples received were 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

Asbestos Counter/Identifier:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General 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.

Trace Environmental P/L
Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Attention: **Matthew Vanderheyden**

Report **673733-S**
Project name WILLOUGHBY DSI
Project ID 19.13
Received Date Aug 28, 2019

Client Sample ID			**SB1/MW4_0.2**	**SB1/MW4_0.5**	**SB2_0.1**	**SB3_0.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S19-Au41167**	**S19-Au41168**	**S19-Au41169**	**S19-Au41170**
Date Sampled			**Aug 26, 2019**	**Aug 26, 2019**	**Aug 26, 2019**	**Aug 26, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	74	116	90	100
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			SB1/MW4_0.2	SB1/MW4_0.5	SB2_0.1	SB3_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41167	S19-Au41168	S19-Au41169	S19-Au41170
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	< 0.5	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Total MAH*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	-	-	-
4-Bromofluorobenzene (surr.)	1	%	74	-	-	-
Toluene-d8 (surr.)	1	%	79	-	-	-

Client Sample ID			SB1/MW4_0.2	SB1/MW4_0.5	SB2_0.1	SB3_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41167	S19-Au41168	S19-Au41169	S19-Au41170
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
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	%	69	80	85	75
p-Terphenyl-d14 (surr.)	1	%	93	80	96	69
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	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	123	-	122	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	86	-

Client Sample ID			SB1/MW4_0.2	SB1/MW4_0.5	SB2_0.1	SB3_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41167	S19-Au41168	S19-Au41169	S19-Au41170
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	114	-	123	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	123	-	122	-
Tetrachloro-m-xylene (surr.)	1	%	80	-	86	-

Client Sample ID			SB1/MW4_0.2	SB1/MW4_0.5	SB2_0.1	SB3_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41167	S19-Au41168	S19-Au41169	S19-Au41170
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	-
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	-
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	-
Pentachlorophenol	1	mg/kg	< 1	-	-	-
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	-
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	-
2-Nitrophenol	1.0	mg/kg	< 1	-	-	-
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	-
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	-
4-Nitrophenol	5	mg/kg	< 5	-	-	-
Dinoseb	20	mg/kg	< 20	-	-	-
Phenol	0.5	mg/kg	< 0.5	-	-	-
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	-
Phenol-d6 (surr.)	1	%	36	-	-	-
% Clay	1	%	-	2.5	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	46	70	50	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	7.9	-	-	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	6.3	-	-
Total Organic Carbon	0.1	%	-	0.3	-	-
% Moisture	1	%	10	9.1	4.6	5.7
Heavy Metals						
Arsenic	2	mg/kg	2.3	3.3	2.9	3.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	10	9.6	5.4	5.6
Copper	5	mg/kg	12	< 5	11	8.7
Iron	20	mg/kg	-	1000	-	-
Lead	5	mg/kg	31	6.1	38	51
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	45	< 5	90	54
Heavy Metals						
Iron (%)	0.01	%	-	0.10	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	5.8	-	-

Client Sample ID			SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41171	S19-Au41172	S19-Au41173	S19-Au41174
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	62	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	62	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	83	88	94
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	-
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	-	-
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	-	-
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	-	-
Allyl chloride	0.5	mg/kg	-	< 0.5	-	-
Benzene	0.1	mg/kg	-	< 0.1	-	-
Bromobenzene	0.5	mg/kg	-	< 0.5	-	-
Bromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	-
Bromoform	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41171	S19-Au41172	S19-Au41173	S19-Au41174
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
Bromomethane	0.5	mg/kg	-	< 0.5	-	-
Carbon disulfide	0.5	mg/kg	-	< 0.5	-	-
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	-
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Chloroethane	0.5	mg/kg	-	< 0.5	-	-
Chloroform	0.5	mg/kg	-	< 0.5	-	-
Chloromethane	0.5	mg/kg	-	< 0.5	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	-
Dibromomethane	0.5	mg/kg	-	< 0.5	-	-
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
Iodomethane	0.5	mg/kg	-	< 0.5	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Styrene	0.5	mg/kg	-	< 0.5	-	-
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	-
Trichloroethene	0.5	mg/kg	-	< 0.5	-	-
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	-
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
Total MAH*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5	-	-
4-Bromofluorobenzene (surr.)	1	%	-	83	-	-
Toluene-d8 (surr.)	1	%	-	85	-	-
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

Client Sample ID			SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41171	S19-Au41172	S19-Au41173	S19-Au41174
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	74	83	91	90
p-Terphenyl-d14 (surr.)	1	%	71	109	127	88
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	0.05	mg/kg	-	< 0.05	< 0.05	-
Toxaphene	1	mg/kg	-	< 1	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	139	132	-
Tetrachloro-m-xylene (surr.)	1	%	-	89	94	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Bolstar	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Coumaphos	2	mg/kg	-	< 2	< 2	-
Demeton-S	0.2	mg/kg	-	< 0.2	< 0.2	-
Demeton-O	0.2	mg/kg	-	< 0.2	< 0.2	-
Diazinon	0.2	mg/kg	-	< 0.2	< 0.2	-
Dichlorvos	0.2	mg/kg	-	< 0.2	< 0.2	-
Dimethoate	0.2	mg/kg	-	< 0.2	< 0.2	-
Disulfoton	0.2	mg/kg	-	< 0.2	< 0.2	-
EPN	0.2	mg/kg	-	< 0.2	< 0.2	-
Ethion	0.2	mg/kg	-	< 0.2	< 0.2	-

Client Sample ID			SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41171	S19-Au41172	S19-Au41173	S19-Au41174
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	-	< 0.2	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fenitrothion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fensulfothion	0.2	mg/kg	-	< 0.2	< 0.2	-
Fenthion	0.2	mg/kg	-	< 0.2	< 0.2	-
Malathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Merphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Methyl parathion	0.2	mg/kg	-	< 0.2	< 0.2	-
Mevinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Monocrotophos	2	mg/kg	-	< 2	< 2	-
Naled	0.2	mg/kg	-	< 0.2	< 0.2	-
Omethoate	2	mg/kg	-	< 2	< 2	-
Phorate	0.2	mg/kg	-	< 0.2	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	< 0.2	-
Pyrazophos	0.2	mg/kg	-	< 0.2	< 0.2	-
Ronnel	0.2	mg/kg	-	< 0.2	< 0.2	-
Terbufos	0.2	mg/kg	-	< 0.2	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	< 0.2	-
Tokuthion	0.2	mg/kg	-	< 0.2	< 0.2	-
Trichloronate	0.2	mg/kg	-	< 0.2	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	132	130	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	< 0.1	-
Total PCB*	0.1	mg/kg	-	< 0.1	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	139	132	-
Tetrachloro-m-xylene (surr.)	1	%	-	89	94	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1.0	mg/kg	-	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	-

Client Sample ID			SB3_0.2	SB4_0.1	SB5_0.1	SB5_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41171	S19-Au41172	S19-Au41173	S19-Au41174
Date Sampled			Aug 26, 2019	Aug 26, 2019	Aug 26, 2019	Aug 26, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	77	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	31	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	6.8	-
% Moisture	1	%	6.3	7.3	17	19
Heavy Metals						
Arsenic	2	mg/kg	3.2	2.2	5.0	3.7
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.5	< 0.4
Chromium	5	mg/kg	8.7	10	9.5	15
Copper	5	mg/kg	13	15	17	15
Lead	5	mg/kg	46	110	500	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	60	91	140	29

Client Sample ID			SB6_0.1	SB7_0.1	SB7_0.5	SB8_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41175	S19-Au41176	S19-Au41177	S19-Au41178
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	120	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	120	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	110	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	110	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	95	95	90	76

Client Sample ID			SB6_0.1	SB7_0.1	SB7_0.5	SB8_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41175	S19-Au41176	S19-Au41177	S19-Au41178
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
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	%	82	71	75	81
p-Terphenyl-d14 (surr.)	1	%	117	71	76	74
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	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	131	-	-	62
Tetrachloro-m-xylene (surr.)	1	%	87	-	-	85

Client Sample ID			SB6_0.1	SB7_0.1	SB7_0.5	SB8_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41175	S19-Au41176	S19-Au41177	S19-Au41178
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	126	-	-	66
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	131	-	-	62
Tetrachloro-m-xylene (surr.)	1	%	87	-	-	85

Client Sample ID			SB6_0.1	SB7_0.1	SB7_0.5	SB8_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41175	S19-Au41176	S19-Au41177	S19-Au41178
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Phenol-d6 (surr.)	1	%	55	-	-	65
% Clay	1	%	3.8	-	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	19	-	-	34
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.8	-	-	6.4
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	6.0	-	-	-
Total Organic Carbon	0.1	%	2.6	-	-	-
% Moisture	1	%	7.4	8.5	12	16
Heavy Metals						
Arsenic	2	mg/kg	2.5	5.3	7.7	18
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.7	11	8.3	21
Copper	5	mg/kg	11	13	6.1	110
Iron	20	mg/kg	6600	-	-	-
Lead	5	mg/kg	18	41	19	850
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.2
Nickel	5	mg/kg	< 5	< 5	< 5	11
Zinc	5	mg/kg	31	55	35	610
Heavy Metals						
Iron (%)	0.01	%	0.66	-	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	9.0	-	-	-

Client Sample ID			SB8_0.6	SB9_0.1	SB10_0.1	SB10_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41179	S19-Au41180	S19-Au41181	S19-Au41182
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	99
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	99
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	98	85	100	101
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	%	72	75	51	77
p-Terphenyl-d14 (surr.)	1	%	62	63	62	67

Client Sample ID			SB8_0.6	SB9_0.1	SB10_0.1	SB10_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41179	S19-Au41180	S19-Au41181	S19-Au41182
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	0.3	-
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	-	-	0.06	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	0.36	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	0.36	-
Dibutylchlorendate (surr.)	1	%	-	-	76	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	55	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			SB8_0.6	SB9_0.1	SB10_0.1	SB10_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41179	S19-Au41180	S19-Au41181	S19-Au41182
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	83	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	<0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	76	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	55	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1.0	mg/kg	-	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	67	-

Client Sample ID			SB8_0.6	SB9_0.1	SB10_0.1	SB10_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41179	S19-Au41180	S19-Au41181	S19-Au41182
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
% Clay	1	%	-	-	-	28
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	75	120	110
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	8.4	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	-	5.2
Total Organic Carbon	0.1	%	-	-	-	0.8
% Moisture	1	%	13	9.4	14	18
Heavy Metals						
Arsenic	2	mg/kg	11	2.5	3.8	3.8
Cadmium	0.4	mg/kg	0.9	0.6	< 0.4	< 0.4
Chromium	5	mg/kg	26	5.8	14	19
Copper	5	mg/kg	230	21	21	16
Iron	20	mg/kg	-	-	-	23000
Lead	5	mg/kg	290	85	67	22
Mercury	0.1	mg/kg	0.2	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	8.7	< 5	< 5	< 5
Zinc	5	mg/kg	590	110	81	170
Heavy Metals						
Iron (%)	0.01	%	-	-	-	2.3
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	8.7

Client Sample ID			SB11_0.1	SB11_0.6	SB12_0.1	SB12_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41183	S19-Au41184	S19-Au41185	S19-Au41186
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	130	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	130	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	130	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	130	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SB11_0.1	SB11_0.6	SB12_0.1	SB12_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41183	S19-Au41184	S19-Au41185	S19-Au41186
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
BTEX						
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88	93	96	101
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	%	52	76	78	66
p-Terphenyl-d14 (surr.)	1	%	64	62	80	60
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	0.05	mg/kg	< 0.05	-	< 0.05	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	< 0.05	-

Client Sample ID			SB11_0.1	SB11_0.6	SB12_0.1	SB12_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41183	S19-Au41184	S19-Au41185	S19-Au41186
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	83	-	68	-
Tetrachloro-m-xylene (surr.)	1	%	57	-	83	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Bolstar	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	< 0.2	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Coumaphos	2	mg/kg	< 2	-	< 2	-
Demeton-S	0.2	mg/kg	< 0.2	-	< 0.2	-
Demeton-O	0.2	mg/kg	< 0.2	-	< 0.2	-
Diazinon	0.2	mg/kg	< 0.2	-	< 0.2	-
Dichlorvos	0.2	mg/kg	< 0.2	-	< 0.2	-
Dimethoate	0.2	mg/kg	< 0.2	-	< 0.2	-
Disulfoton	0.2	mg/kg	< 0.2	-	< 0.2	-
EPN	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethion	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethoprop	0.2	mg/kg	< 0.2	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenitrothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fensulfothion	0.2	mg/kg	< 0.2	-	< 0.2	-
Fenthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Malathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Merphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Methyl parathion	0.2	mg/kg	< 0.2	-	< 0.2	-
Mevinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Monocrotophos	2	mg/kg	< 2	-	< 2	-
Naled	0.2	mg/kg	< 0.2	-	< 0.2	-
Omethoate	2	mg/kg	< 2	-	< 2	-
Phorate	0.2	mg/kg	< 0.2	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	< 0.2	-
Pyrazophos	0.2	mg/kg	< 0.2	-	< 0.2	-
Ronnel	0.2	mg/kg	< 0.2	-	< 0.2	-
Terbufos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	< 0.2	-
Tokuthion	0.2	mg/kg	< 0.2	-	< 0.2	-
Trichloronate	0.2	mg/kg	< 0.2	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	92	-	73	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	< 0.1	-	< 0.1	-
Total PCB*	0.1	mg/kg	< 0.1	-	< 0.1	-

Client Sample ID			SB11_0.1	SB11_0.6	SB12_0.1	SB12_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41183	S19-Au41184	S19-Au41185	S19-Au41186
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Dibutylchlorendate (surr.)	1	%	83	-	68	-
Tetrachloro-m-xylene (surr.)	1	%	57	-	83	-
% Moisture	1	%	13	18	8.8	10
Heavy Metals						
Arsenic	2	mg/kg	5.3	5.5	7.4	7.1
Cadmium	0.4	mg/kg	2.7	< 0.4	0.6	0.7
Chromium	5	mg/kg	11	17	15	27
Copper	5	mg/kg	28	< 5	30	47
Lead	5	mg/kg	160	15	120	210
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	13	< 5	< 5	< 5
Zinc	5	mg/kg	230	8.2	260	270

Client Sample ID			SB13_0.1	SB13_0.6	SB14_0.1	SB15_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41187	S19-Au41188	S19-Au41189	S19-Au41190
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	970	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	230	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	1200	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	230	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	1000	< 50	78
TRH C10-C36 (Total)	50	mg/kg	< 50	1230	< 50	78
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	87	85	89	91
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

Client Sample ID			SB13_0.1	SB13_0.6	SB14_0.1	SB15_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41187	S19-Au41188	S19-Au41189	S19-Au41190
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	52	63	79	51
p-Terphenyl-d14 (surr.)	1	%	66	61	76	67
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	0.05	mg/kg	< 0.05	-	-	< 0.05
Toxaphene	1	mg/kg	< 1	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	80	-	-	82
Tetrachloro-m-xylene (surr.)	1	%	58	-	-	58

Client Sample ID			SB13_0.1	SB13_0.6	SB14_0.1	SB15_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41187	S19-Au41188	S19-Au41189	S19-Au41190
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Coumaphos	2	mg/kg	< 2	-	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	-	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	-	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	-	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	-	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	-	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	-	-	< 0.2
EPN	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	-	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	-	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Monocrotophos	2	mg/kg	< 2	-	-	< 2
Naled	0.2	mg/kg	< 0.2	-	-	< 0.2
Omethoate	2	mg/kg	< 2	-	-	< 2
Phorate	0.2	mg/kg	< 0.2	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	-	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	-	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	-	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	-	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	-	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	88	-	-	98
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	-	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	80	-	-	82
Tetrachloro-m-xylene (surr.)	1	%	58	-	-	58

Client Sample ID			SB13_0.1	SB13_0.6	SB14_0.1	SB15_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41187	S19-Au41188	S19-Au41189	S19-Au41190
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	-	-	< 1
Pentachlorophenol	1	mg/kg	< 1	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	< 10	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	< 1	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	< 1	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	-	-	< 0.4
4-Nitrophenol	5	mg/kg	< 5	-	-	< 5
Dinoseb	20	mg/kg	< 20	-	-	< 20
Phenol	0.5	mg/kg	< 0.5	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	-	-	< 20
Phenol-d6 (surr.)	1	%	73	-	-	69
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	28	-	-	91
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	6.3	-	-	5.0
% Moisture	1	%	21	16	20	9.5
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	8.9	2.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	0.5	< 0.4
Chromium	5	mg/kg	11	8.4	30	9.5
Copper	5	mg/kg	36	< 5	33	11
Lead	5	mg/kg	440	14	69	210
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	8.0	< 5
Zinc	5	mg/kg	190	20	180	69

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	120	< 100	< 100

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	120	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	53	< 50	< 50
TRH C29-C36	50	mg/kg	67	120	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	67	173	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	101	93	95	77
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	-	< 0.5
Allyl chloride	0.5	mg/kg	-	-	-	< 0.5
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroethane	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	< 0.5
Toluene	0.1	mg/kg	-	-	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Total MAH*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	-	77
Toluene-d8 (surr.)	1	%	-	-	-	82
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	0.8	< 0.5	1.9
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.1	0.6	2.1
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.4	1.2	2.4
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	0.9
Benzo(a)pyrene	0.5	mg/kg	< 0.5	0.7	< 0.5	1.4
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.1
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.9
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.3
Chrysene	0.5	mg/kg	< 0.5	0.6	< 0.5	1.1
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	0.9	< 0.5	2.3
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	1.3
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	0.8	< 0.5	2.3
Total PAH*	0.5	mg/kg	< 0.5	3.5	< 0.5	13.1
2-Fluorobiphenyl (surr.)	1	%	82	70	85	52
p-Terphenyl-d14 (surr.)	1	%	78	71	83	69

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
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	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	89
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	60
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	100
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	89
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	60
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	74

Client Sample ID			SB15_0.4	SB16_0.1	SB16_0.3	SB17_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41191	S19-Au41192	S19-Au41193	S19-Au41194
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
% Clay	1	%	-	7.5	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	76	-	79
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	8.2
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	4.4	-	-
Total Organic Carbon	0.1	%	-	1.7	-	-
% Moisture	1	%	12	8.7	5.9	12
Heavy Metals						
Arsenic	2	mg/kg	3.2	2.9	< 2	5.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	9.7	6.6	14
Copper	5	mg/kg	5.9	28	< 5	21
Iron	20	mg/kg	-	8500	-	-
Lead	5	mg/kg	60	150	22	64
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	36	120	15	320
Heavy Metals						
Iron (%)	0.01	%	-	0.85	-	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	4.7	-	-

Client Sample ID			SB18_0.1	SB18_0.5	SB19_0.1	SB20_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41195	S19-Au41196	S19-Au41197	S19-Au41198
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	160	160	160	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	160	160	160	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	110	120	110	< 50
TRH C29-C36	50	mg/kg	75	65	72	62
TRH C10-C36 (Total)	50	mg/kg	185	185	182	62
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			SB18_0.1	SB18_0.5	SB19_0.1	SB20_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41195	S19-Au41196	S19-Au41197	S19-Au41198
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
BTEX						
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	92	89	90
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	4.0	4.7	3.1	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	4.0	4.7	3.3	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	4.0	4.7	3.6	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	2.6	2.8	1.6	< 0.5
Benzo(a)pyrene	0.5	mg/kg	2.5	3.3	2.4	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	2.1	2.1	1.4	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	2.0	2.2	1.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	2.3	2.2	1.6	< 0.5
Chrysene	0.5	mg/kg	2.5	2.6	1.6	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	0.5	0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	4.4	4.8	1.5	< 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	2.1	1.9	1.6	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	1.5	2.4	< 0.5	< 0.5
Pyrene	0.5	mg/kg	4.1	4.9	1.8	< 0.5
Total PAH*	0.5	mg/kg	26.6	30.9	15	< 0.5
2-Fluorobiphenyl (surr.)	1	%	71	75	69	55
p-Terphenyl-d14 (surr.)	1	%	64	70	66	70
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	0.05	mg/kg	-	-	-	< 0.05
Toxaphene	1	mg/kg	-	-	-	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	-	< 0.05

Client Sample ID			SB18_0.1	SB18_0.5	SB19_0.1	SB20_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41195	S19-Au41196	S19-Au41197	S19-Au41198
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	-	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	-	95
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	60
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Bolstar	0.2	mg/kg	-	-	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	-	< 0.2
Coumaphos	2	mg/kg	-	-	-	< 2
Demeton-S	0.2	mg/kg	-	-	-	< 0.2
Demeton-O	0.2	mg/kg	-	-	-	< 0.2
Diazinon	0.2	mg/kg	-	-	-	< 0.2
Dichlorvos	0.2	mg/kg	-	-	-	< 0.2
Dimethoate	0.2	mg/kg	-	-	-	< 0.2
Disulfoton	0.2	mg/kg	-	-	-	< 0.2
EPN	0.2	mg/kg	-	-	-	< 0.2
Ethion	0.2	mg/kg	-	-	-	< 0.2
Ethoprop	0.2	mg/kg	-	-	-	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	-	< 0.2
Fenitrothion	0.2	mg/kg	-	-	-	< 0.2
Fensulfothion	0.2	mg/kg	-	-	-	< 0.2
Fenthion	0.2	mg/kg	-	-	-	< 0.2
Malathion	0.2	mg/kg	-	-	-	< 0.2
Merphos	0.2	mg/kg	-	-	-	< 0.2
Methyl parathion	0.2	mg/kg	-	-	-	< 0.2
Mevinphos	0.2	mg/kg	-	-	-	< 0.2
Monocrotophos	2	mg/kg	-	-	-	< 2
Naled	0.2	mg/kg	-	-	-	< 0.2
Omethoate	2	mg/kg	-	-	-	< 2
Phorate	0.2	mg/kg	-	-	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	-	< 0.2
Pyrazophos	0.2	mg/kg	-	-	-	< 0.2
Ronnel	0.2	mg/kg	-	-	-	< 0.2
Terbufos	0.2	mg/kg	-	-	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	-	< 0.2
Tokuthion	0.2	mg/kg	-	-	-	< 0.2
Trichloronate	0.2	mg/kg	-	-	-	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	-	108
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	-	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	-	< 0.1
Total PCB*	0.1	mg/kg	-	-	-	< 0.1

Client Sample ID			SB18_0.1	SB18_0.5	SB19_0.1	SB20_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41195	S19-Au41196	S19-Au41197	S19-Au41198
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Dibutylchlorendate (surr.)	1	%	-	-	-	95
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	60
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.4.6-Trichlorophenol	1	mg/kg	-	-	-	< 1
2.6-Dichlorophenol	0.5	mg/kg	-	-	-	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	-	-	-	< 1
Pentachlorophenol	1	mg/kg	-	-	-	< 1
Tetrachlorophenols - Total	10	mg/kg	-	-	-	< 10
Total Halogenated Phenol*	1	mg/kg	-	-	-	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	-	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	-	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	-	< 0.2
2-Nitrophenol	1.0	mg/kg	-	-	-	< 1
2.4-Dimethylphenol	0.5	mg/kg	-	-	-	< 0.5
2.4-Dinitrophenol	5	mg/kg	-	-	-	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	-	< 0.4
4-Nitrophenol	5	mg/kg	-	-	-	< 5
Dinoseb	20	mg/kg	-	-	-	< 20
Phenol	0.5	mg/kg	-	-	-	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	-	-	-	< 20
Phenol-d6 (surr.)	1	%	-	-	-	77
% Clay	1	%	-	-	-	7.5
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	-	28
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	-	6.1
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	-	5.5
Total Organic Carbon	0.1	%	-	-	-	2.9
% Moisture	1	%	9.7	6.9	18	16
Heavy Metals						
Arsenic	2	mg/kg	4.2	2.9	5.6	6.5
Cadmium	0.4	mg/kg	0.8	< 0.4	1.0	0.4
Chromium	5	mg/kg	15	11	13	8.0
Copper	5	mg/kg	120	50	48	28
Iron	20	mg/kg	-	-	-	7000
Lead	5	mg/kg	200	54	260	54
Mercury	0.1	mg/kg	< 0.1	0.1	0.1	< 0.1
Nickel	5	mg/kg	< 5	5.1	< 5	< 5
Zinc	5	mg/kg	160	62	430	160
Heavy Metals						
Iron (%)	0.01	%	-	-	-	0.70
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	9.7

Client Sample ID			SB21_0.05	SB21_0.1	SB22_0.05	SB23_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41199	S19-Au41200	S19-Au41201	S19-Au41202
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	59
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	59
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	90	93	73	73
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromoform	0.5	mg/kg	-	-	< 0.5	< 0.5

Client Sample ID			SB21_0.05	SB21_0.1	SB22_0.05	SB23_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41199	S19-Au41200	S19-Au41201	S19-Au41202
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
Bromomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloroform	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Styrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	< 0.5
Trichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	< 0.3
Total MAH*	0.5	mg/kg	-	-	< 0.5	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	-	< 0.5	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	-	73	73
Toluene-d8 (surr.)	1	%	-	-	81	89
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

Client Sample ID			SB21_0.05	SB21_0.1	SB22_0.05	SB23_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41199	S19-Au41200	S19-Au41201	S19-Au41202
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
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	%	76	74	57	82
p-Terphenyl-d14 (surr.)	1	%	73	72	72	76
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	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	99	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	62	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-

Client Sample ID			SB21_0.05	SB21_0.1	SB22_0.05	SB23_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41199	S19-Au41200	S19-Au41201	S19-Au41202
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	112	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	99	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	62	-
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	-	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	-	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	-	< 1	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	-	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	-	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	-	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	-	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
2-Nitrophenol	1.0	mg/kg	-	-	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	-	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	-	< 5	-

Client Sample ID			SB21_0.05	SB21_0.1	SB22_0.05	SB23_0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41199	S19-Au41200	S19-Au41201	S19-Au41202
Date Sampled			Aug 27, 2019	Aug 27, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
4-Nitrophenol	5	mg/kg	-	-	< 5	-
Dinoseb	20	mg/kg	-	-	< 20	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	-	< 20	-
Phenol-d6 (surr.)	1	%	-	-	75	-
% Clay	1	%	-	-	6.3	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	23	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	6.2	-
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	0.1	pH Units	-	-	5.0	-
Total Organic Carbon	0.1	%	-	-	3.9	-
% Moisture	1	%	23	18	22	10
Heavy Metals						
Arsenic	2	mg/kg	13	7.4	3.5	2.0
Cadmium	0.4	mg/kg	1.3	< 0.4	0.9	< 0.4
Chromium	5	mg/kg	26	13	18	7.8
Copper	5	mg/kg	54	10.0	63	10
Iron	20	mg/kg	-	-	7500	-
Lead	5	mg/kg	110	20	200	14
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	16	< 5	< 5	< 5
Zinc	5	mg/kg	190	< 5	290	35
Heavy Metals						
Iron (%)	0.01	%	-	-	0.75	-
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	8.0	-

Client Sample ID			SB23_0.5	QS1	QS2	QS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41203	S19-Au41204	S19-Au41205	S19-Au41206
Date Sampled			Aug 27, 2019	Aug 26, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			SB23_0.5	QS1	QS2	QS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41203	S19-Au41204	S19-Au41205	S19-Au41206
Date Sampled			Aug 27, 2019	Aug 26, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	76	97	64	88
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	%	64	67	74	81
p-Terphenyl-d14 (surr.)	1	%	65	70	75	78
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4.5-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.4.6-Trichlorophenol	1	mg/kg	-	< 1	< 1	-
2.6-Dichlorophenol	0.5	mg/kg	-	< 0.5	< 0.5	-
4-Chloro-3-methylphenol	1	mg/kg	-	< 1	< 1	-
Pentachlorophenol	1	mg/kg	-	< 1	< 1	-
Tetrachlorophenols - Total	10	mg/kg	-	< 10	< 10	-
Total Halogenated Phenol*	1	mg/kg	-	< 1	< 1	-
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	-	< 20	< 20	-
2-Methyl-4.6-dinitrophenol	5	mg/kg	-	< 5	< 5	-
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	< 0.2	< 0.2	-
2-Nitrophenol	1.0	mg/kg	-	< 1	< 1	-
2.4-Dimethylphenol	0.5	mg/kg	-	< 0.5	< 0.5	-
2.4-Dinitrophenol	5	mg/kg	-	< 5	< 5	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	< 0.4	< 0.4	-
4-Nitrophenol	5	mg/kg	-	< 5	< 5	-

Client Sample ID			SB23_0.5	QS1	QS2	QS3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41203	S19-Au41204	S19-Au41205	S19-Au41206
Date Sampled			Aug 27, 2019	Aug 26, 2019	Aug 27, 2019	Aug 27, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
Dinoseb	20	mg/kg	-	< 20	< 20	-
Phenol	0.5	mg/kg	-	< 0.5	< 0.5	-
Total Non-Halogenated Phenol*	20	mg/kg	-	< 20	< 20	-
Phenol-d6 (surr.)	1	%	-	78	91	-
% Moisture	1	%	13	< 1	16	23
Heavy Metals						
Arsenic	2	mg/kg	4.8	2.3	17	13
Cadmium	0.4	mg/kg	< 0.4	< 0.4	1.6	< 0.4
Chromium	5	mg/kg	19	8.8	24	58
Copper	5	mg/kg	16	14	86	65
Lead	5	mg/kg	35	43	330	120
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.2	< 0.1
Nickel	5	mg/kg	< 5	< 5	10	15
Zinc	5	mg/kg	64	80	800	350

Client Sample ID			[R20]TS1	TB1	SB24_0.1	SB24_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41210	S19-Au41211	S19-Au41213	S19-Au41214
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	98	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	110	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	< 100	< 100
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	< 100	< 100
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	110	< 20	< 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-C36 (Total)	50	mg/kg	-	-	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	110	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	110	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	130	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	110	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	110	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	110	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	98	85	81	94

Client Sample ID			[R20]TS1	TB1	SB24_0.1	SB24_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41210	S19-Au41211	S19-Au41213	S19-Au41214
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
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	%	-	-	51	85
p-Terphenyl-d14 (surr.)	1	%	-	-	63	85
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	-	-	0.06	-
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	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	0.06	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	81	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	57	-

Client Sample ID			[R20]TS1	TB1	SB24_0.1	SB24_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41210	S19-Au41211	S19-Au41213	S19-Au41214
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Bolstar	0.2	mg/kg	-	-	< 0.2	-
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	-
Coumaphos	2	mg/kg	-	-	< 2	-
Demeton-S	0.2	mg/kg	-	-	< 0.2	-
Demeton-O	0.2	mg/kg	-	-	< 0.2	-
Diazinon	0.2	mg/kg	-	-	< 0.2	-
Dichlorvos	0.2	mg/kg	-	-	< 0.2	-
Dimethoate	0.2	mg/kg	-	-	< 0.2	-
Disulfoton	0.2	mg/kg	-	-	< 0.2	-
EPN	0.2	mg/kg	-	-	< 0.2	-
Ethion	0.2	mg/kg	-	-	< 0.2	-
Ethoprop	0.2	mg/kg	-	-	< 0.2	-
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	-
Fenitrothion	0.2	mg/kg	-	-	< 0.2	-
Fensulfothion	0.2	mg/kg	-	-	< 0.2	-
Fenthion	0.2	mg/kg	-	-	< 0.2	-
Malathion	0.2	mg/kg	-	-	< 0.2	-
Merphos	0.2	mg/kg	-	-	< 0.2	-
Methyl parathion	0.2	mg/kg	-	-	< 0.2	-
Mevinphos	0.2	mg/kg	-	-	< 0.2	-
Monocrotophos	2	mg/kg	-	-	< 2	-
Naled	0.2	mg/kg	-	-	< 0.2	-
Omethoate	2	mg/kg	-	-	< 2	-
Phorate	0.2	mg/kg	-	-	< 0.2	-
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	-
Pyrazophos	0.2	mg/kg	-	-	< 0.2	-
Ronnel	0.2	mg/kg	-	-	< 0.2	-
Terbufos	0.2	mg/kg	-	-	< 0.2	-
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	-
Tokuthion	0.2	mg/kg	-	-	< 0.2	-
Trichloronate	0.2	mg/kg	-	-	< 0.2	-
Triphenylphosphate (surr.)	1	%	-	-	92	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	81	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	57	-
% Moisture	1	%	-	-	19	11

Client Sample ID			[R20]TS1	TB1	SB24_0.1	SB24_0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S19-Au41210	S19-Au41211	S19-Au41213	S19-Au41214
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	-	4.0	< 2
Cadmium	0.4	mg/kg	-	-	1.1	< 0.4
Chromium	5	mg/kg	-	-	11	6.0
Copper	5	mg/kg	-	-	35	12
Lead	5	mg/kg	-	-	430	58
Mercury	0.1	mg/kg	-	-	0.1	< 0.1
Nickel	5	mg/kg	-	-	< 5	< 5
Zinc	5	mg/kg	-	-	460	68

Client Sample ID			SB25_0.1	SB26_0.1
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Au41215	S19-Au41216
Date Sampled			Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	280	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	280	< 100
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	260	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	260	< 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	%	88	119
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	0.9	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.2	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.4	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	0.7	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.7	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	0.6	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5

Client Sample ID			SB25_0.1	SB26_0.1
Sample Matrix			Soil	Soil
Eurofins Sample No.			S19-Au41215	S19-Au41216
Date Sampled			Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Benzo(k)fluoranthene	0.5	mg/kg	0.5	< 0.5
Chrysene	0.5	mg/kg	0.6	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.9	< 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	0.9	< 0.5
Total PAH*	0.5	mg/kg	4.9	< 0.5
2-Fluorobiphenyl (surr.)	1	%	79	74
p-Terphenyl-d14 (surr.)	1	%	70	68
% Moisture	1	%	55	12
Heavy Metals				
Arsenic	2	mg/kg	26	3.3
Cadmium	0.4	mg/kg	6.5	< 0.4
Chromium	5	mg/kg	28	12
Copper	5	mg/kg	410	23
Lead	5	mg/kg	430	52
Mercury	0.1	mg/kg	0.2	0.3
Nickel	5	mg/kg	21	6.3
Zinc	5	mg/kg	2100	91

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.

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 - 2013 NEPM Fractions	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Sep 02, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 02, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Sep 03, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Volatile Organics	Melbourne	Sep 02, 2019	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices (USEPA 8260)			
pH (1:5 Aqueous extract at 25°C as rec.)	Melbourne	Sep 02, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Sep 02, 2019	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)			
Polychlorinated Biphenyls	Melbourne	Sep 02, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
NEPM Screen for Soil Classification			
% Clay	Brisbane	Aug 29, 2019	0 Days
- Method: LTM-GEN-7040			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Sep 02, 2019	7 Days
- Method: LTM-INO-4030 Conductivity			
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	Melbourne	Sep 02, 2019	7 Days
- Method: LTM-GEN-7090 pH in soil by ISE			
Total Organic Carbon	Melbourne	Sep 03, 2019	28 Days
- Method: LTM-INO-4060 Total Organic Carbon in water and soil			
Heavy Metals	Melbourne	Sep 02, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Cation Exchange Capacity	Melbourne	Sep 03, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Melbourne	Aug 28, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

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Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
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Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	SB1/MW4_0.2	Aug 26, 2019		Soil	S19-Au41167	X	X			X	X	X	X			X	
2	SB1/MW4_0.5	Aug 26, 2019		Soil	S19-Au41168								X	X	X		
3	SB2_0.1	Aug 26, 2019		Soil	S19-Au41169	X	X				X		X		X		
4	SB3_0.1	Aug 26, 2019		Soil	S19-Au41170	X							X		X		
5	SB3_0.2	Aug 26, 2019		Soil	S19-Au41171								X		X		
6	SB4_0.1	Aug 26, 2019		Soil	S19-Au41172	X					X	X	X		X		
7	SB5_0.1	Aug 26, 2019		Soil	S19-Au41173	X	X			X	X		X			X	
8	SB5_0.5	Aug 26, 2019		Soil	S19-Au41174								X		X		
9	SB6_0.1	Aug 27, 2019		Soil	S19-Au41175	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
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
10	SB7_0.1	Aug 27, 2019		Soil	S19-Au41176	X							X		X		
11	SB7_0.5	Aug 27, 2019		Soil	S19-Au41177								X		X		
12	SB8_0.1	Aug 27, 2019		Soil	S19-Au41178	X	X			X	X		X			X	
13	SB8_0.6	Aug 27, 2019		Soil	S19-Au41179								X		X		
14	SB9_0.1	Aug 27, 2019		Soil	S19-Au41180	X	X						X		X		
15	SB10_0.1	Aug 27, 2019		Soil	S19-Au41181	X	X			X	X		X			X	
16	SB10_0.5	Aug 27, 2019		Soil	S19-Au41182								X	X	X		
17	SB11_0.1	Aug 27, 2019		Soil	S19-Au41183	X					X		X		X		
18	SB11_0.6	Aug 27, 2019		Soil	S19-Au41184								X		X		
19	SB12_0.1	Aug 27, 2019		Soil	S19-Au41185	X					X		X		X		
20	SB12_0.4	Aug 27, 2019		Soil	S19-Au41186								X		X		
21	SB13_0.1	Aug 27, 2019		Soil	S19-Au41187	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
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
22	SB13_0.6	Aug 27, 2019		Soil	S19-Au41188								X		X		
23	SB14_0.1	Aug 27, 2019		Soil	S19-Au41189	X							X		X		
24	SB15_0.1	Aug 27, 2019		Soil	S19-Au41190	X	X			X	X		X			X	
25	SB15_0.4	Aug 27, 2019		Soil	S19-Au41191								X		X		
26	SB16_0.1	Aug 27, 2019		Soil	S19-Au41192	X							X	X	X		
27	SB16_0.3	Aug 27, 2019		Soil	S19-Au41193								X		X		
28	SB17_0.1	Aug 27, 2019		Soil	S19-Au41194	X	X			X	X	X	X			X	
29	SB18_0.1	Aug 27, 2019		Soil	S19-Au41195	X							X		X		
30	SB18_0.5	Aug 27, 2019		Soil	S19-Au41196								X		X		
31	SB19_0.1	Aug 27, 2019		Soil	S19-Au41197	X							X		X		
32	SB20_0.1	Aug 27, 2019		Soil	S19-Au41198	X				X	X		X	X		X	
33	SB21_0.05	Aug 27, 2019		Soil	S19-Au41199	X							X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
34	SB21_0.1	Aug 27, 2019		Soil	S19-Au41200								X		X		
35	SB22_0.05	Aug 27, 2019		Soil	S19-Au41201	X				X	X	X	X	X		X	
36	SB23_0.1	Aug 27, 2019		Soil	S19-Au41202	X						X	X		X		
37	SB23_0.5	Aug 27, 2019		Soil	S19-Au41203								X		X		
38	QS1	Aug 26, 2019		Soil	S19-Au41204	X							X			X	
39	QS2	Aug 27, 2019		Soil	S19-Au41205								X			X	
40	QS3	Aug 27, 2019		Soil	S19-Au41206								X		X		
41	RB1	Aug 26, 2019		Water	S19-Au41207											X	
42	RB2	Aug 27, 2019		Water	S19-Au41208											X	
43	RB3	Aug 28, 2019		Water	S19-Au41209											X	
44	TS1	Aug 28, 2019		Soil	S19-Au41210												X
45	TB1	Aug 28, 2019		Soil	S19-Au41211												X

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
46	LAB SPIKE	Aug 28, 2019		Soil	S19-Au41212												X
47	SB24_0.1	Aug 28, 2019		Soil	S19-Au41213	X					X		X		X		
48	SB24_0.5	Aug 28, 2019		Soil	S19-Au41214								X		X		
49	SB25_0.1	Aug 28, 2019		Soil	S19-Au41215	X							X		X		
50	SB26_0.1	Aug 28, 2019		Soil	S19-Au41216	X							X		X		
51	SB1/MW4_1.0	Aug 26, 2019		Soil	S19-Au41256				X								
52	SB1/MW4_2.0	Aug 26, 2019		Soil	S19-Au41257				X								
53	SB1/MW4_3.0	Aug 26, 2019		Soil	S19-Au41258				X								
54	SB1/MW4_4.0	Aug 26, 2019		Soil	S19-Au41259				X								
55	SB1/MW4_5.0	Aug 26, 2019		Soil	S19-Au41260				X								
56	SB8_1.0	Aug 27, 2019		Soil	S19-Au41261				X								
57	SB9_0.6	Aug 27, 2019		Soil	S19-Au41262				X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
58	SB18_1.0	Aug 27, 2019		Soil	S19-Au41263				X								
59	SB22_0.6	Aug 27, 2019		Soil	S19-Au41264				X								
60	SB24_0.8	Aug 28, 2019		Soil	S19-Au41265				X								
61	SB25_0.6	Aug 28, 2019		Soil	S19-Au41266				X								
62	SB3/0.1A	Aug 26, 2019		Soil	S19-Au41619			X									
Test Counts						27	9	12	12	10	15	5	44	6	32	15	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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 - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
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 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							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
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	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 10			10	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1.0	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
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	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							
Cation Exchange Capacity							
Cation Exchange Capacity	meq/100g	< 0.05			0.05	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
Naphthalene	%	97			70-130	Pass	
TRH C6-C10	%	98			70-130	Pass	
TRH C6-C10	%	84			70-130	Pass	
TRH >C10-C16	%	78			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	105			70-130	Pass	
TRH C10-C14	%	83			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	98			70-130	Pass	
Toluene	%	105			70-130	Pass	
Ethylbenzene	%	105			70-130	Pass	
m&p-Xylenes	%	105			70-130	Pass	
Xylenes - Total	%	106			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	87			70-130	Pass	
1.1.1-Trichloroethane	%	108			70-130	Pass	
1.2-Dichlorobenzene	%	120			70-130	Pass	
1.2-Dichloroethane	%	102			70-130	Pass	
Benzene	%	104			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
Toluene	%	107			70-130	Pass	
Trichloroethene	%	88			70-130	Pass	
Xylenes - Total	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	107			70-130	Pass	
Acenaphthylene	%	113			70-130	Pass	
Anthracene	%	90			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	111			70-130	Pass	
Benzo(b&j)fluoranthene	%	121			70-130	Pass	
Benzo(g.h.i)perylene	%	114			70-130	Pass	
Benzo(k)fluoranthene	%	87			70-130	Pass	
Chrysene	%	102			70-130	Pass	
Dibenz(a.h)anthracene	%	125			70-130	Pass	
Fluoranthene	%	96			70-130	Pass	
Fluorene	%	108			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	121			70-130	Pass	
Naphthalene	%	129			70-130	Pass	
Phenanthrene	%	107			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	91			70-130	Pass	
4.4'-DDD	%	88			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	76			70-130	Pass	
a-BHC	%	91			70-130	Pass	
Aldrin	%	94			70-130	Pass	
b-BHC	%	121			70-130	Pass	
d-BHC	%	87			70-130	Pass	
Dieldrin	%	85			70-130	Pass	
Endosulfan I	%	100			70-130	Pass	
Endosulfan II	%	92			70-130	Pass	
Endosulfan sulphate	%	80			70-130	Pass	
Endrin	%	84			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	%	88			70-130	Pass	
Endrin ketone	%	85			70-130	Pass	
g-BHC (Lindane)	%	106			70-130	Pass	
Heptachlor	%	80			70-130	Pass	
Heptachlor epoxide	%	91			70-130	Pass	
Hexachlorobenzene	%	94			70-130	Pass	
Methoxychlor	%	84			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	81			70-130	Pass	
Dimethoate	%	74			70-130	Pass	
Ethion	%	79			70-130	Pass	
Fenitrothion	%	105			70-130	Pass	
Methyl parathion	%	107			70-130	Pass	
Mevinphos	%	72			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	94			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	90			30-130	Pass	
2.4-Dichlorophenol	%	106			30-130	Pass	
2.4.5-Trichlorophenol	%	115			30-130	Pass	
2.4.6-Trichlorophenol	%	105			30-130	Pass	
2.6-Dichlorophenol	%	88			30-130	Pass	
4-Chloro-3-methylphenol	%	111			30-130	Pass	
Pentachlorophenol	%	97			30-130	Pass	
Tetrachlorophenols - Total	%	106			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	61			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	80			30-130	Pass	
2-Methylphenol (o-Cresol)	%	116			30-130	Pass	
2-Nitrophenol	%	119			30-130	Pass	
2.4-Dimethylphenol	%	110			30-130	Pass	
2.4-Dinitrophenol	%	56			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	93			30-130	Pass	
4-Nitrophenol	%	102			30-130	Pass	
Dinoseb	%	98			30-130	Pass	
Phenol	%	80			30-130	Pass	
LCS - % Recovery							
% Clay	%	118			70-130	Pass	
Total Organic Carbon	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	102			80-120	Pass	
Cadmium	%	84			80-120	Pass	
Chromium	%	98			80-120	Pass	
Copper	%	109			80-120	Pass	
Iron	%	116			80-120	Pass	
Lead	%	97			80-120	Pass	
Mercury	%	87			75-125	Pass	
Nickel	%	96			80-120	Pass	
Zinc	%	96			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Au43702	NCP	%	91			70-130	Pass	
4.4'-DDD	M19-Au43702	NCP	%	96			70-130	Pass	
4.4'-DDE	M19-Au43702	NCP	%	74			70-130	Pass	
a-BHC	M19-Au43702	NCP	%	102			70-130	Pass	
Aldrin	M19-Au43702	NCP	%	71			70-130	Pass	
b-BHC	M19-Au43702	NCP	%	123			70-130	Pass	
d-BHC	M19-Au43702	NCP	%	92			70-130	Pass	
Dieldrin	M19-Au43702	NCP	%	86			70-130	Pass	
Endosulfan I	M19-Au43702	NCP	%	79			70-130	Pass	
Endosulfan II	M19-Au43702	NCP	%	84			70-130	Pass	
Endosulfan sulphate	M19-Au43702	NCP	%	82			70-130	Pass	
Endrin	S19-Au41970	NCP	%	84			70-130	Pass	
Endrin aldehyde	M19-Au43702	NCP	%	73			70-130	Pass	
Endrin ketone	M19-Au43702	NCP	%	105			70-130	Pass	
g-BHC (Lindane)	M19-Au43702	NCP	%	106			70-130	Pass	
Heptachlor	M19-Au43702	NCP	%	88			70-130	Pass	
Heptachlor epoxide	M19-Au43702	NCP	%	72			70-130	Pass	
Hexachlorobenzene	M19-Au43702	NCP	%	77			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S19-Au41970	NCP	%	81			70-130	Pass	
Dimethoate	S19-Au41970	NCP	%	75			70-130	Pass	
Ethion	S19-Au41970	NCP	%	71			70-130	Pass	
Fenitrothion	S19-Au41970	NCP	%	79			70-130	Pass	
Methyl parathion	S19-Au41970	NCP	%	71			70-130	Pass	
Mevinphos	S19-Au41970	NCP	%	73			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	M19-Au41229	NCP	%	92			70-130	Pass	
Aroclor-1260	M19-Au41229	NCP	%	120			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Au41173	CP	%	95			75-125	Pass	
Cadmium	S19-Au41173	CP	%	79			75-125	Pass	
Chromium	S19-Au41173	CP	%	91			75-125	Pass	
Copper	S19-Au41173	CP	%	102			75-125	Pass	
Iron	S19-Au41173	CP	%	64			75-125	Fail	Q08
Mercury	S19-Au41173	CP	%	85			70-130	Pass	
Nickel	S19-Au41173	CP	%	90			75-125	Pass	
Zinc	S19-Au41173	CP	%	101			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Au41181	CP	%	104			70-130	Pass	
TRH C6-C10	S19-Au41181	CP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Au41181	CP	%	116			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Au41181	CP	%	91			70-130	Pass	
Toluene	S19-Au41181	CP	%	99			70-130	Pass	
Ethylbenzene	S19-Au41181	CP	%	98			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	S19-Au41181	CP	%	98			70-130	Pass	
o-Xylene	S19-Au41181	CP	%	99			70-130	Pass	
Xylenes - Total	S19-Au41181	CP	%	99			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	S19-Au37261	NCP	%	81			70-130	Pass	
Methoxychlor	S19-Au37261	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Au41183	CP	%	99			75-125	Pass	
Cadmium	S19-Au41183	CP	%	63			75-125	Fail	Q08
Chromium	S19-Au41183	CP	%	95			75-125	Pass	
Copper	S19-Au41183	CP	%	108			75-125	Pass	
Lead	S19-Au41183	CP	%	104			75-125	Pass	
Mercury	S19-Au41183	CP	%	89			70-130	Pass	
Nickel	S19-Au41183	CP	%	80			75-125	Pass	
Zinc	S19-Au41183	CP	%	91			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Au41191	CP	%	108			70-130	Pass	
TRH C6-C10	S19-Au41191	CP	%	104			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Au41191	CP	%	113			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Au41191	CP	%	97			70-130	Pass	
Toluene	S19-Au41191	CP	%	104			70-130	Pass	
Ethylbenzene	S19-Au41191	CP	%	104			70-130	Pass	
m&p-Xylenes	S19-Au41191	CP	%	106			70-130	Pass	
o-Xylene	S19-Au41191	CP	%	106			70-130	Pass	
Xylenes - Total	S19-Au41191	CP	%	106			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-Au41195	CP	%	99			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Au41195	CP	%	102			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Au41198	CP	%	93			70-130	Pass	
Acenaphthylene	S19-Au41198	CP	%	99			70-130	Pass	
Anthracene	S19-Au41198	CP	%	113			70-130	Pass	
Benz(a)anthracene	S19-Au41198	CP	%	86			70-130	Pass	
Benzo(a)pyrene	S19-Au41198	CP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Au41198	CP	%	82			70-130	Pass	
Benzo(g.h.i)perylene	S19-Au41198	CP	%	98			70-130	Pass	
Benzo(k)fluoranthene	S19-Au41198	CP	%	73			70-130	Pass	
Chrysene	S19-Au41198	CP	%	93			70-130	Pass	
Dibenz(a.h)anthracene	S19-Au41198	CP	%	99			70-130	Pass	
Fluoranthene	S19-Au41198	CP	%	108			70-130	Pass	
Fluorene	S19-Au41198	CP	%	102			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Au41198	CP	%	100			70-130	Pass	
Naphthalene	S19-Au41198	CP	%	97			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	S19-Au41198	CP	%	104			70-130	Pass	
Pyrene	S19-Au41198	CP	%	108			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S19-Au41198	CP	%	99			30-130	Pass	
2.4-Dichlorophenol	S19-Au41198	CP	%	97			30-130	Pass	
2.4.5-Trichlorophenol	S19-Au41198	CP	%	96			30-130	Pass	
2.4.6-Trichlorophenol	S19-Au41198	CP	%	97			30-130	Pass	
2.6-Dichlorophenol	S19-Au41198	CP	%	97			30-130	Pass	
4-Chloro-3-methylphenol	S19-Au41198	CP	%	107			30-130	Pass	
Pentachlorophenol	S19-Au41198	CP	%	99			30-130	Pass	
Tetrachlorophenols - Total	S19-Au41198	CP	%	104			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	S19-Au41198	CP	%	83			30-130	Pass	
2-Methyl-4.6-dinitrophenol	S19-Au41198	CP	%	76			30-130	Pass	
2-Methylphenol (o-Cresol)	S19-Au41198	CP	%	97			30-130	Pass	
2-Nitrophenol	S19-Au41198	CP	%	101			30-130	Pass	
2.4-Dimethylphenol	S19-Au41198	CP	%	118			30-130	Pass	
2.4-Dinitrophenol	S19-Au41198	CP	%	85			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Au41198	CP	%	110			30-130	Pass	
4-Nitrophenol	S19-Au41198	CP	%	101			30-130	Pass	
Dinoseb	S19-Au41198	CP	%	91			30-130	Pass	
Phenol	S19-Au41198	CP	%	98			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Au41201	CP	%	80			70-130	Pass	
TRH C6-C10	S19-Au41201	CP	%	117			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Au41201	CP	%	119			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Au41201	CP	%	109			70-130	Pass	
Toluene	S19-Au41201	CP	%	106			70-130	Pass	
Ethylbenzene	S19-Au41201	CP	%	101			70-130	Pass	
m&p-Xylenes	S19-Au41201	CP	%	105			70-130	Pass	
o-Xylene	S19-Au41201	CP	%	110			70-130	Pass	
Xylenes - Total	S19-Au41201	CP	%	107			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	S19-Au41201	CP	%	99			70-130	Pass	
1.1.1-Trichloroethane	S19-Au41201	CP	%	108			70-130	Pass	
1.2-Dichlorobenzene	S19-Au41201	CP	%	121			70-130	Pass	
1.2-Dichloroethane	S19-Au41201	CP	%	128			70-130	Pass	
Trichloroethene	S19-Au41201	CP	%	97			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Au41203	CP	%	124			70-130	Pass	
TRH C6-C10	S19-Au41203	CP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Au41203	CP	%	104			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX				Result 1					
Benzene	S19-Au41203	CP	%	107			70-130	Pass	
Toluene	S19-Au41203	CP	%	111			70-130	Pass	
Ethylbenzene	S19-Au41203	CP	%	122			70-130	Pass	
m&p-Xylenes	S19-Au41203	CP	%	127			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Au41203	CP	%	81			75-125	Pass	
Cadmium	S19-Au41203	CP	%	90			75-125	Pass	
Chromium	S19-Au41203	CP	%	78			75-125	Pass	
Copper	S19-Au41203	CP	%	85			75-125	Pass	
Lead	S19-Au41203	CP	%	71			75-125	Fail	Q08
Mercury	S19-Au41203	CP	%	93			70-130	Pass	
Nickel	S19-Au41203	CP	%	79			75-125	Pass	
Zinc	S19-Au41203	CP	%	49			75-125	Fail	Q08
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Au41214	CP	%	107			70-130	Pass	
Acenaphthylene	S19-Au41214	CP	%	116			70-130	Pass	
Anthracene	S19-Au41214	CP	%	90			70-130	Pass	
Benz(a)anthracene	S19-Au41214	CP	%	107			70-130	Pass	
Benzo(a)pyrene	S19-Au41214	CP	%	114			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Au41214	CP	%	117			70-130	Pass	
Benzo(g.h.i)perylene	S19-Au41214	CP	%	122			70-130	Pass	
Benzo(k)fluoranthene	S19-Au41214	CP	%	96			70-130	Pass	
Chrysene	S19-Au41214	CP	%	109			70-130	Pass	
Dibenz(a.h)anthracene	S19-Au41214	CP	%	130			70-130	Pass	
Fluoranthene	S19-Au41214	CP	%	100			70-130	Pass	
Fluorene	S19-Au41214	CP	%	114			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Au41214	CP	%	130			70-130	Pass	
Naphthalene	S19-Au41214	CP	%	125			70-130	Pass	
Phenanthrene	S19-Au41214	CP	%	110			70-130	Pass	
Pyrene	S19-Au41214	CP	%	99			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	S19-Au41214	CP	%	93			30-130	Pass	
2.4-Dichlorophenol	S19-Au41214	CP	%	108			30-130	Pass	
2.4.5-Trichlorophenol	S19-Au41214	CP	%	120			30-130	Pass	
2.4.6-Trichlorophenol	S19-Au41214	CP	%	105			30-130	Pass	
2.6-Dichlorophenol	S19-Au41214	CP	%	88			30-130	Pass	
4-Chloro-3-methylphenol	S19-Au41214	CP	%	117			30-130	Pass	
Pentachlorophenol	S19-Au41214	CP	%	120			30-130	Pass	
Tetrachlorophenols - Total	S19-Au41214	CP	%	115			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	S19-Au41214	CP	%	125			30-130	Pass	
2-Methyl-4.6-dinitrophenol	S19-Au41214	CP	%	118			30-130	Pass	
2-Methylphenol (o-Cresol)	S19-Au41214	CP	%	117			30-130	Pass	
2-Nitrophenol	S19-Au41214	CP	%	127			30-130	Pass	
2.4-Dimethylphenol	S19-Au41214	CP	%	112			30-130	Pass	
2.4-Dinitrophenol	S19-Au41214	CP	%	105			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Au41214	CP	%	93			30-130	Pass	
4-Nitrophenol	S19-Au41214	CP	%	118			30-130	Pass	
Dinoseb	S19-Au41214	CP	%	117			30-130	Pass	
Phenol	S19-Au41214	CP	%	82			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Toxaphene	M19-Au40573	NCP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S19-Au41167	CP	uS/cm	46	38	18	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	S19-Au41167	CP	pH Units	7.9	7.8	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M19-Jl22376	NCP	%	< 1	< 1	<1	30%	Pass	
Total Organic Carbon	S19-Au41168	CP	%	0.3	0.3	5.2	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Au41171	CP	%	6.3	6.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Au41172	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Au41172	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au41172	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Bromochloromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan I	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Au41172	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-Au41172	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-Au41172	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-Au41172	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-Au41172	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-Au41172	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
4-Chloro-3-methylphenol	S19-Au41172	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-Au41172	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-Au41172	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-Au41172	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-Au41172	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-Au41172	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-Au41172	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-Au41172	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Au41172	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-Au41172	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-Au41172	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-Au41172	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au41172	CP	mg/kg	2.2	2.1	5.0	30%	Pass	
Cadmium	S19-Au41172	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Au41172	CP	mg/kg	10	8.9	14	30%	Pass	
Copper	S19-Au41172	CP	mg/kg	15	15	2.0	30%	Pass	
Iron	S19-Au41172	CP	mg/kg	4200	3800	10	30%	Pass	
Lead	S19-Au41172	CP	mg/kg	110	120	5.0	30%	Pass	
Mercury	S19-Au41172	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Au41172	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-Au41172	CP	mg/kg	91	80	13	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au41173	CP	mg/kg	5.0	5.0	<1	30%	Pass	
Cadmium	S19-Au41173	CP	mg/kg	0.5	0.5	<1	30%	Pass	
Chromium	S19-Au41173	CP	mg/kg	9.5	9.7	2.0	30%	Pass	
Copper	S19-Au41173	CP	mg/kg	17	17	1.0	30%	Pass	
Iron	S19-Au41173	CP	mg/kg	9000	9100	<1	30%	Pass	
Lead	S19-Au41173	CP	mg/kg	500	500	1.0	30%	Pass	
Mercury	S19-Au41173	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Au41173	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-Au41173	CP	mg/kg	140	140	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Au41180	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Au41180	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Au41180	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au41180	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au41180	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au41180	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au41180	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au41180	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au41180	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Au41181	CP	%	14	14	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au41183	CP	mg/kg	5.3	5.2	2.0	30%	Pass	
Cadmium	S19-Au41183	CP	mg/kg	2.7	2.8	<1	30%	Pass	
Chromium	S19-Au41183	CP	mg/kg	11	11	1.0	30%	Pass	
Copper	S19-Au41183	CP	mg/kg	28	29	2.0	30%	Pass	
Iron	S19-Au41183	CP	mg/kg	9700	9800	1.0	30%	Pass	
Lead	S19-Au41183	CP	mg/kg	160	160	1.0	30%	Pass	
Mercury	S19-Au41183	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Au41183	CP	mg/kg	13	13	1.0	30%	Pass	
Zinc	S19-Au41183	CP	mg/kg	230	230	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-Au41184	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Au41184	CP	mg/kg	130	220	47	30%	Fail	Q15
TRH >C34-C40	S19-Au41184	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-Au41184	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Au41184	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Au41184	CP	mg/kg	130	210	49	30%	Fail	Q15
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Au41190	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Au41190	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Au41190	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au41190	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au41190	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au41190	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au41190	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au41190	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au41190	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Au41191	CP	%	12	12	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Au41197	CP	mg/kg	1.6	1.2	28	30%	Pass	
Benzo(a)pyrene	S19-Au41197	CP	mg/kg	2.4	1.7	32	30%	Fail	Q15
Benzo(b&j)fluoranthene	S19-Au41197	CP	mg/kg	1.4	1.1	31	30%	Fail	Q15
Benzo(g.h.i)perylene	S19-Au41197	CP	mg/kg	1.5	1.2	23	30%	Pass	
Benzo(k)fluoranthene	S19-Au41197	CP	mg/kg	1.6	1.1	34	30%	Fail	Q15
Chrysene	S19-Au41197	CP	mg/kg	1.6	1.2	30	30%	Pass	
Dibenz(a.h)anthracene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Au41197	CP	mg/kg	1.5	1.5	3.0	30%	Pass	
Fluorene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Au41197	CP	mg/kg	1.6	1.1	33	30%	Fail	Q15
Naphthalene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Au41197	CP	mg/kg	1.8	1.6	12	30%	Pass	

Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-Au41197	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-Au41197	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-Au41197	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-Au41197	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-Au41197	CP	mg/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-Au41197	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-Au41197	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-Au41197	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-Au41197	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-Au41197	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Au41197	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-Au41197	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-Au41197	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-Au41197	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	S19-Au41198	CP	uS/cm	28	46	47	30%	Fail	Q15
pH (1:5 Aqueous extract at 25°C as rec.)	S19-Au41198	CP	pH Units	6.1	5.9	pass	30%	Pass	
pH (units)(1:5 soil:CaCl2 extract at 25°C as rec.)	S19-Au41198	CP	pH Units	5.5	5.3	pass	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Au41200	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Au41200	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Au41200	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au41200	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au41200	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au41200	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au41200	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au41200	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au41200	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Au41201	CP	%	22	23	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au41202	CP	mg/kg	2.0	2.1	1.0	30%	Pass	
Cadmium	S19-Au41202	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Au41202	CP	mg/kg	7.8	7.2	8.0	30%	Pass	
Copper	S19-Au41202	CP	mg/kg	10	11	1.0	30%	Pass	
Iron	S19-Au41202	CP	mg/kg	7200	7400	4.0	30%	Pass	
Lead	S19-Au41202	CP	mg/kg	14	15	7.0	30%	Pass	
Mercury	S19-Au41202	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Nickel	S19-Au41202	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-Au41202	CP	mg/kg	35	42	19	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au41203	CP	mg/kg	4.8	4.9	3.0	30%	Pass	
Cadmium	S19-Au41203	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Au41203	CP	mg/kg	19	19	1.0	30%	Pass	
Copper	S19-Au41203	CP	mg/kg	16	16	2.0	30%	Pass	
Iron	S19-Au41203	CP	mg/kg	21000	21000	2.0	30%	Pass	
Lead	S19-Au41203	CP	mg/kg	35	35	2.0	30%	Pass	
Mercury	S19-Au41203	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S19-Au41203	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	S19-Au41203	CP	mg/kg	64	65	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S19-Au41204	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Au41204	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Au41204	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S19-Au41204	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S19-Au41204	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Au41204	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Au41213	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S19-Au41213	CP	mg/kg	0.06	< 0.05	47	30%	Fail	Q15
Endosulfan I	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endosulfan sulphate	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Au41213	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-Au41213	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-Au41213	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-Au41213	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-Au41213	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-Au41213	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-Au41213	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-Au41213	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-Au41213	CP	mg/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-Au41213	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-Au41213	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-Au41213	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-Au41213	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-Au41213	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Au41213	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-Au41213	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-Au41213	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-Au41213	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Au41216	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Au41216	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Au41216	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Au41216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Au41216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Au41216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Au41216	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Au41216	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Au41216	CP	mg/kg	< 0.3	< 0.3	<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
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Alena Bounkeua	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Joseph Edouard	Senior Analyst-Organic (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General 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.

Trace Environmental P/L
Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Attention: **Matthew Vanderheyden**

Report **673733-W**
Project name WILLOUGHBY DSI
Project ID 19.13
Received Date Aug 28, 2019

Client Sample ID			**RB1**	**RB2**	**RB3**
Sample Matrix			**Water**	**Water**	**Water**
Eurofins Sample No.			**S19-Au41207**	**S19-Au41208**	**S19-Au41209**
Date Sampled			**Aug 26, 2019**	**Aug 27, 2019**	**Aug 28, 2019**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	111	114
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001

Client Sample ID			RB1	RB2	RB3
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S19-Au41207	S19-Au41208	S19-Au41209
Date Sampled			Aug 26, 2019	Aug 27, 2019	Aug 28, 2019
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	64	60	63
p-Terphenyl-d14 (surr.)	1	%	66	63	70
Phenols (Halogenated)					
2-Chlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003
2.4-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	< 0.01	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	< 0.03	< 0.03
Total Halogenated Phenol*	0.01	mg/L	< 0.01	< 0.01	< 0.01
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1	< 0.1	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	< 0.003	< 0.003
2-Nitrophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01
2.4-Dimethylphenol	0.003	mg/L	< 0.003	< 0.003	< 0.003
2.4-Dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	< 0.006	< 0.006
4-Nitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03
Dinoseb	0.1	mg/L	< 0.1	< 0.1	< 0.1
Phenol	0.003	mg/L	< 0.003	< 0.003	< 0.003
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	< 0.1	< 0.1
Phenol-d6 (surr.)	1	%	40	37	38
Heavy Metals					
Arsenic	0.001	mg/L	< 0.001	< 0.001	< 0.001
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper	0.001	mg/L	< 0.001	< 0.001	< 0.001
Lead	0.001	mg/L	< 0.001	< 0.001	< 0.001
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001
Nickel	0.001	mg/L	< 0.001	< 0.001	< 0.001
Zinc	0.005	mg/L	< 0.005	< 0.005	< 0.005

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.

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	Melbourne	Aug 30, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Aug 30, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 30, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Aug 30, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Aug 30, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Aug 30, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Aug 30, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Aug 30, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	SB1/MW4_0.2	Aug 26, 2019		Soil	S19-Au41167	X	X			X	X	X	X			X	
2	SB1/MW4_0.5	Aug 26, 2019		Soil	S19-Au41168								X	X	X		
3	SB2_0.1	Aug 26, 2019		Soil	S19-Au41169	X	X				X		X		X		
4	SB3_0.1	Aug 26, 2019		Soil	S19-Au41170	X							X		X		
5	SB3_0.2	Aug 26, 2019		Soil	S19-Au41171								X		X		
6	SB4_0.1	Aug 26, 2019		Soil	S19-Au41172	X					X	X	X		X		
7	SB5_0.1	Aug 26, 2019		Soil	S19-Au41173	X	X			X	X		X			X	
8	SB5_0.5	Aug 26, 2019		Soil	S19-Au41174								X		X		
9	SB6_0.1	Aug 27, 2019		Soil	S19-Au41175	X				X	X		X	X		X	

eurofins | Environment Testing

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Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
10	SB7_0.1	Aug 27, 2019		Soil	S19-Au41176	X							X		X		
11	SB7_0.5	Aug 27, 2019		Soil	S19-Au41177								X		X		
12	SB8_0.1	Aug 27, 2019		Soil	S19-Au41178	X	X			X	X		X			X	
13	SB8_0.6	Aug 27, 2019		Soil	S19-Au41179								X		X		
14	SB9_0.1	Aug 27, 2019		Soil	S19-Au41180	X	X						X		X		
15	SB10_0.1	Aug 27, 2019		Soil	S19-Au41181	X	X			X	X		X			X	
16	SB10_0.5	Aug 27, 2019		Soil	S19-Au41182								X	X	X		
17	SB11_0.1	Aug 27, 2019		Soil	S19-Au41183	X					X		X		X		
18	SB11_0.6	Aug 27, 2019		Soil	S19-Au41184								X		X		
19	SB12_0.1	Aug 27, 2019		Soil	S19-Au41185	X					X		X		X		
20	SB12_0.4	Aug 27, 2019		Soil	S19-Au41186								X		X		
21	SB13_0.1	Aug 27, 2019		Soil	S19-Au41187	X	X			X	X		X			X	

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Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 673733
Phone: 02 8960 0555
Fax:

Received: Aug 28, 2019 12:10 PM
Due: Sep 4, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Asbestos - WA guidelines	Conductivity (1:5 aqueous extract at 25°C as rec.)	HOLD	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Volatile Organics	Moisture Set	NEPM Screen for Soil Classification	Eurofins | mgt Suite B7	Eurofins | mgt Suite B7A	BTEXN and Volatile TRH
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
22	SB13_0.6	Aug 27, 2019		Soil	S19-Au41188								X		X		
23	SB14_0.1	Aug 27, 2019		Soil	S19-Au41189	X							X		X		
24	SB15_0.1	Aug 27, 2019		Soil	S19-Au41190	X	X			X	X		X			X	
25	SB15_0.4	Aug 27, 2019		Soil	S19-Au41191								X		X		
26	SB16_0.1	Aug 27, 2019		Soil	S19-Au41192	X							X	X	X		
27	SB16_0.3	Aug 27, 2019		Soil	S19-Au41193								X		X		
28	SB17_0.1	Aug 27, 2019		Soil	S19-Au41194	X	X			X	X	X	X			X	
29	SB18_0.1	Aug 27, 2019		Soil	S19-Au41195	X							X		X		
30	SB18_0.5	Aug 27, 2019		Soil	S19-Au41196								X		X		
31	SB19_0.1	Aug 27, 2019		Soil	S19-Au41197	X							X		X		
32	SB20_0.1	Aug 27, 2019		Soil	S19-Au41198	X				X	X		X	X		X	
33	SB21_0.05	Aug 27, 2019		Soil	S19-Au41199	X							X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
34	SB21_0.1	Aug 27, 2019		Soil	S19-Au41200								X		X		
35	SB22_0.05	Aug 27, 2019		Soil	S19-Au41201	X				X	X	X	X	X		X	
36	SB23_0.1	Aug 27, 2019		Soil	S19-Au41202	X						X	X		X		
37	SB23_0.5	Aug 27, 2019		Soil	S19-Au41203								X		X		
38	QS1	Aug 26, 2019		Soil	S19-Au41204	X							X			X	
39	QS2	Aug 27, 2019		Soil	S19-Au41205								X			X	
40	QS3	Aug 27, 2019		Soil	S19-Au41206								X		X		
41	RB1	Aug 26, 2019		Water	S19-Au41207											X	
42	RB2	Aug 27, 2019		Water	S19-Au41208											X	
43	RB3	Aug 28, 2019		Water	S19-Au41209											X	
44	TS1	Aug 28, 2019		Soil	S19-Au41210												X
45	TB1	Aug 28, 2019		Soil	S19-Au41211												X

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
46	LAB SPIKE	Aug 28, 2019		Soil	S19-Au41212												X
47	SB24_0.1	Aug 28, 2019		Soil	S19-Au41213	X					X		X		X		
48	SB24_0.5	Aug 28, 2019		Soil	S19-Au41214								X		X		
49	SB25_0.1	Aug 28, 2019		Soil	S19-Au41215	X							X		X		
50	SB26_0.1	Aug 28, 2019		Soil	S19-Au41216	X							X		X		
51	SB1/MW4_1.0	Aug 26, 2019		Soil	S19-Au41256				X								
52	SB1/MW4_2.0	Aug 26, 2019		Soil	S19-Au41257				X								
53	SB1/MW4_3.0	Aug 26, 2019		Soil	S19-Au41258				X								
54	SB1/MW4_4.0	Aug 26, 2019		Soil	S19-Au41259				X								
55	SB1/MW4_5.0	Aug 26, 2019		Soil	S19-Au41260				X								
56	SB8_1.0	Aug 27, 2019		Soil	S19-Au41261				X								
57	SB9_0.6	Aug 27, 2019		Soil	S19-Au41262				X								

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Melbourne Laboratory - NATA Site # 1254 & 14271							X	X		X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217						X			X						X	X	X
Brisbane Laboratory - NATA Site # 20794														X			
Perth Laboratory - NATA Site # 23736																	
58	SB18_1.0	Aug 27, 2019		Soil	S19-Au41263				X								
59	SB22_0.6	Aug 27, 2019		Soil	S19-Au41264				X								
60	SB24_0.8	Aug 28, 2019		Soil	S19-Au41265				X								
61	SB25_0.6	Aug 28, 2019		Soil	S19-Au41266				X								
62	SB3/0.1A	Aug 26, 2019		Soil	S19-Au41619			X									
Test Counts						27	9	12	12	10	15	5	44	6	32	15	3

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
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							
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	122			70-130	Pass	
TRH C10-C14	%	81			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	122			70-130	Pass	
Toluene	%	108			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	97			70-130	Pass	
Xylenes - Total	%	103			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	95			70-130	Pass	
TRH C6-C10	%	127			70-130	Pass	
TRH >C10-C16	%	75			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	96			70-130	Pass	
Acenaphthylene	%	95			70-130	Pass	
Anthracene	%	76			70-130	Pass	
Benz(a)anthracene	%	86			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	82			70-130	Pass	
Benzo(g.h.i)perylene	%	116			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	114			70-130	Pass	
Dibenz(a.h)anthracene	%	111			70-130	Pass	
Fluoranthene	%	77			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	81			70-130	Pass	
Naphthalene	%	100			70-130	Pass	
Phenanthrene	%	86			70-130	Pass	
Pyrene	%	83			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenols (Halogenated)							
2-Chlorophenol	%	93			30-130	Pass	
2.4-Dichlorophenol	%	76			30-130	Pass	
2.4.5-Trichlorophenol	%	84			30-130	Pass	
2.4.6-Trichlorophenol	%	83			30-130	Pass	
2.6-Dichlorophenol	%	88			30-130	Pass	
4-Chloro-3-methylphenol	%	84			30-130	Pass	
Pentachlorophenol	%	51			30-130	Pass	
Tetrachlorophenols - Total	%	73			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	37			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	48			30-130	Pass	
2-Methylphenol (o-Cresol)	%	82			30-130	Pass	
2-Nitrophenol	%	86			30-130	Pass	
2.4-Dimethylphenol	%	91			30-130	Pass	
2.4-Dinitrophenol	%	41			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	90			30-130	Pass	
4-Nitrophenol	%	75			30-130	Pass	
Dinoseb	%	60			30-130	Pass	
Phenol	%	60			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	99			80-120	Pass	
Cadmium	%	96			80-120	Pass	
Chromium	%	100			80-120	Pass	
Copper	%	97			80-120	Pass	
Lead	%	103			80-120	Pass	
Mercury	%	104			75-125	Pass	
Nickel	%	98			80-120	Pass	
Zinc	%	94			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	M19-Au42940	NCP	%	108			70-130	Pass	
TRH C10-C14	B19-Au42733	NCP	%	80			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Au42940	NCP	%	98			70-130	Pass	
Toluene	M19-Au42940	NCP	%	102			70-130	Pass	
Ethylbenzene	M19-Au42940	NCP	%	103			70-130	Pass	
m&p-Xylenes	M19-Au42940	NCP	%	108			70-130	Pass	
o-Xylene	M19-Au42940	NCP	%	109			70-130	Pass	
Xylenes - Total	M19-Au42940	NCP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Au42940	NCP	%	112			70-130	Pass	
TRH C6-C10	M19-Au42940	NCP	%	110			70-130	Pass	
TRH >C10-C16	B19-Au42733	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M19-Au33282	NCP	%	95			70-130	Pass	
Acenaphthylene	M19-Au33282	NCP	%	99			70-130	Pass	
Anthracene	M19-Au33282	NCP	%	93			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene	M19-Au33282	NCP	%	95			70-130	Pass	
Benzo(a)pyrene	M19-Au33282	NCP	%	103			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Au33282	NCP	%	94			70-130	Pass	
Benzo(g.h.i)perylene	M19-Au33282	NCP	%	106			70-130	Pass	
Benzo(k)fluoranthene	M19-Au33282	NCP	%	114			70-130	Pass	
Chrysene	M19-Au33282	NCP	%	112			70-130	Pass	
Dibenz(a.h)anthracene	M19-Au33282	NCP	%	100			70-130	Pass	
Fluoranthene	M19-Au33282	NCP	%	90			70-130	Pass	
Fluorene	M19-Au33282	NCP	%	99			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M19-Au33282	NCP	%	86			70-130	Pass	
Naphthalene	M19-Au33282	NCP	%	102			70-130	Pass	
Phenanthrene	M19-Au33282	NCP	%	99			70-130	Pass	
Pyrene	M19-Au33282	NCP	%	90			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M19-Au33282	NCP	%	102			30-130	Pass	
2.4-Dichlorophenol	M19-Au33282	NCP	%	95			30-130	Pass	
2.4.5-Trichlorophenol	M19-Au33282	NCP	%	111			30-130	Pass	
2.4.6-Trichlorophenol	M19-Au33282	NCP	%	102			30-130	Pass	
2.6-Dichlorophenol	M19-Au33282	NCP	%	104			30-130	Pass	
4-Chloro-3-methylphenol	M19-Au33282	NCP	%	103			30-130	Pass	
Pentachlorophenol	M19-Au33282	NCP	%	91			30-130	Pass	
Tetrachlorophenols - Total	M19-Au33282	NCP	%	103			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M19-Au33282	NCP	%	94			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M19-Au33282	NCP	%	97			30-130	Pass	
2-Methylphenol (o-Cresol)	M19-Au33282	NCP	%	92			30-130	Pass	
2-Nitrophenol	M19-Au33282	NCP	%	104			30-130	Pass	
2.4-Dimethylphenol	M19-Au33282	NCP	%	95			30-130	Pass	
2.4-Dinitrophenol	M19-Au33282	NCP	%	80			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Au33282	NCP	%	83			30-130	Pass	
4-Nitrophenol	M19-Au33282	NCP	%	58			30-130	Pass	
Dinoseb	M19-Au33282	NCP	%	104			30-130	Pass	
Phenol	M19-Au33282	NCP	%	50			30-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B19-Au40782	NCP	%	96			75-125	Pass	
Cadmium	B19-Au40782	NCP	%	98			75-125	Pass	
Chromium	B19-Au40782	NCP	%	99			75-125	Pass	
Copper	B19-Au40782	NCP	%	99			75-125	Pass	
Lead	B19-Au40782	NCP	%	101			75-125	Pass	
Mercury	B19-Au40782	NCP	%	100			70-130	Pass	
Nickel	B19-Au40782	NCP	%	93			75-125	Pass	
Zinc	B19-Au40782	NCP	%	71			75-125	Fail	
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	M19-Au42336	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	M19-Au42940	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M19-Au42940	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M19-Au42940	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Au42336	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Au42336	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Au42336	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Au42336	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Au42336	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Au42336	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Au42336	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M19-Au42336	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	M19-Au42940	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M19-Au42940	NCP	mg/L	< 0.1		<1	30%	Pass	
TRH >C34-C40	M19-Au42940	NCP	mg/L	< 0.1		<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Au42093	NCP	mg/L	0.049	0.048	2.0	30%	Pass	
Acenaphthylene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M19-Au42093	NCP	mg/L	0.005	0.006	5.0	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M19-Au42093	NCP	mg/L	0.001	0.002	5.0	30%	Pass	
Phenanthrene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M19-Au42093	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Au42093	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Au42093	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Au42093	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	M19-Au42093	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Au42093	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Au42093	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Au42093	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Nitrophenol	M19-Au42093	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	M19-Au42093	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Au42093	NCP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	M19-Au42093	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	M19-Au42093	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	M19-Au42093	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B19-Au40782	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	B19-Au40782	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	B19-Au40782	NCP	mg/L	0.004	0.002	65	30%	Fail	Q15
Copper	B19-Au40782	NCP	mg/L	0.010	0.010	4.0	30%	Pass	
Lead	B19-Au40782	NCP	mg/L	0.001	< 0.001	9.0	30%	Pass	
Mercury	B19-Au40782	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	B19-Au40782	NCP	mg/L	0.042	0.039	8.0	30%	Pass	
Zinc	B19-Au40782	NCP	mg/L	0.23	0.22	7.0	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
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Alena Bounkeua	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

General 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1927524**	Page	: 1 of 6
Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019 17:30
Order number	: ----	Date Analysis Commenced	: 30-Aug-2019
C-O-C number	: ----	Issue Date	: 04-Sep-2019 15:02
Sampler	: JACK ELLIS		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EG005: Poor precision was obtained for Chromium on sample ES1927565-3. Results have been confirmed by re-extraction and re-analysis.
- EA200N: Asbestos weights and percentages are not covered under the Scope of NATA Accreditation.
  Weights of Asbestos are based on extracted bulk asbestos, fibre bundles, and/or ACM and do not include respirable fibres (if present)
  The Asbestos (Fines and Fibrous) weight is calculated from the extracted Fibrous Asbestos and Asbestos Fines as an equivalent weight of 100% Asbestos
  Percentages for Asbestos content in ACM are based on the 2013 NEPM default values.
  All calculations of percentage Asbestos under this method are approximate and should be used as a guide only.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200N: ALS laboratory procedures and methods used for the identification and quantitation of asbestos are consistent with AS4964-2004 and the requirements of the 2013 NEPM for Assessment of Site Contamination
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QS1A	QS2A	QS3A	----	----
			Client sampling date / time	26-Aug-2019 00:00	27-Aug-2019 00:00	27-Aug-2019 00:00	----	----
Compound	CAS Number	LOR	Unit	ES1927524-001	ES1927524-002	ES1927524-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**10.2**	**15.2**	**25.4**	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	----	----	----	----
Asbestos (Trace)	1332-21-4	5	Fibres	**No**	----	----	----	----
Asbestos Type	1332-21-4	-	--	**-**	----	----	----	----
Sample weight (dry)	----	0.01	g	**645**	----	----	----	----
Synthetic Mineral Fibre	----	0.1	g/kg	**No**	----	----	----	----
Organic Fibre	----	0.1	g/kg	**No**	----	----	----	----
APPROVED IDENTIFIER:	----	-	--	**A. SMYLIE**	----	----	----	----
EA200N: Asbestos Quantification (non-NATA)								
ø Asbestos (Fines and Fibrous <7mm)	1332-21-4	0.0004	g	<0.0004	----	----	----	----
ø Asbestos (Fines and Fibrous FA+AF)	----	0.001	% (w/w)	<0.001	----	----	----	----
ø Asbestos Containing Material	1332-21-4	0.1	g	<0.1	----	----	----	----
ø Asbestos Containing Material (as 15% Asbestos in ACM >7mm)	1332-21-4	0.01	% (w/w)	<0.01	----	----	----	----
ø Weight Used for % Calculation	----	0.0001	kg	**0.645**	----	----	----	----
ø Fibrous Asbestos >7mm	----	0.0004	g	<0.0004	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	**15**	**10**	----	----
Cadmium	7440-43-9	1	mg/kg	<1	**1**	<1	----	----
Chromium	7440-47-3	2	mg/kg	**9**	**22**	**41**	----	----
Copper	7440-50-8	5	mg/kg	**7**	**70**	**44**	----	----
Lead	7439-92-1	5	mg/kg	**21**	**308**	**105**	----	----
Nickel	7440-02-0	2	mg/kg	<2	**9**	**47**	----	----
Zinc	7440-66-6	5	mg/kg	**35**	**583**	**209**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	**0.2**	**0.2**	----	----
EP035SF: Total Phenol by Segmented Flow Analyser								
Phenols (Total)	----	1	mg/kg	<1	<1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QS1A	QS2A	QS3A	----	----
				Client sampling date / time	26-Aug-2019 00:00	27-Aug-2019 00:00	27-Aug-2019 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1927524-001	ES1927524-002	ES1927524-003	--------	--------
					Result	Result	Result	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	**0.5**	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	**0.7**	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	**0.7**	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	<0.5	**1.9**	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	<10	<10	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QS1A	QS2A	QS3A	----	----
				Client sampling date / time	26-Aug-2019 00:00	27-Aug-2019 00:00	27-Aug-2019 00:00	----	----
Compound	CAS Number	LOR	Unit		ES1927524-001	ES1927524-002	ES1927524-003	--------	--------
					Result	Result	Result	----	----
EP080: BTEXN - Continued									
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	----	----
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**86.1**	**84.0**	**83.3**	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**96.0**	**94.9**	**93.1**	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**75.6**	**80.5**	**80.6**	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**111**	**111**	**108**	----	----
Anthracene-d10	1719-06-8	0.5	%		**94.2**	**92.8**	**90.7**	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**102**	**101**	**98.1**	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**109**	**112**	**113**	----	----
Toluene-D8	2037-26-5	0.2	%		**109**	**113**	**117**	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**102**	**107**	**109**	----	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	QS1A - 26-Aug-2019 00:00	Mid brown soil.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1927524**	Page	: 1 of 7
Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019
Order number	: ----	Date Analysis Commenced	: 30-Aug-2019
C-O-C number	: ----	Issue Date	: 04-Sep-2019
Sampler	: JACK ELLIS		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 3		
No. of samples analysed	: 3		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alana Smylie	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2558321)									
ES1927040-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	44	43	2.67	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	12	12	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	17	15	11.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	9	8	16.4	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	27	26	4.14	No Limit
ES1927565-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	65	# 45	35.4	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	63	53	16.3	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	9	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	34	21	48.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	11	14	25.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	53	67	22.3	0% - 50%
EP035SF: Total Phenol by Segmented Flow Analyser (QC Lot: 2559319)									
ES1927524-001	QS1A	EP035SF: Phenols (Total)	----	1	mg/kg	<1	<1	0.00	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2558324)									
ES1927040-003	Anonymous	EA055: Moisture Content	----	0.1	%	69.0	67.8	1.79	0% - 20%
ES1927565-005	Anonymous	EA055: Moisture Content	----	0.1	%	15.2	15.3	0.896	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2558320)									
ES1927040-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.00	No Limit
ES1927565-003	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2555600)									
ES1927524-001	QS1A	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2555600) - continued									
ES1927524-001	QS1A	EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2555601)									
ES1927524-001	QS1A	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2555884)									
ES1927361-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1927530-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2555601)									
ES1927524-001	QS1A	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2555884)									
ES1927361-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1927530-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 2555884)									
ES1927361-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2555884) - continued									
ES1927361-001	Anonymous	EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1927530-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2558321)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	108	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	103	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	98.7	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	104	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	103	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	106	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	115	80	122
EP035SF: Total Phenol by Segmented Flow Analyser (QCLot: 2559319)								
EP035SF: Phenols (Total)	----	1	mg/kg	<1	20 mg/kg	87.8	60	102
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2558320)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	102	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2555600)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	108	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	115	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	107	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	114	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	106	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	91.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	117	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	111	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	101	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	96.6	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	102	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	100	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	104	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	95.9	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.3	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	91.0	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2555601)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	93.1	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	96.4	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	89.7	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2555884)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2555884) - continued								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	84.7	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2555601)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	92.3	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	95.2	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	77.5	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2555884)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	82.9	68	128
EP080: BTEXN (QCLot: 2555884)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.1	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.4	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.6	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.0	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	90.8	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	88.7	63	119

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2558321)							
ES1927040-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	90.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	91.5	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	78.8	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	92.8	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	91.2	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	88.4	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	91.0	70	130
EP035SF: Total Phenol by Segmented Flow Analyser (QCLot: 2559319)							
ES1927524-001	QS1A	EP035SF: Phenols (Total)	----	20 mg/kg	110	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2558320)							
ES1927040-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	84.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2555600)							
ES1927524-001	QS1A	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	102	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2555600) - continued							
ES1927524-001	QS1A	EP075(SIM): Pyrene	129-00-0	10 mg/kg	113	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2555601)							
ES1927524-001	QS1A	EP071: C10 - C14 Fraction	----	523 mg/kg	91.2	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	103	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	105	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2555884)							
ES1927361-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	81.0	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2555601)							
ES1927524-001	QS1A	EP071: >C10 - C16 Fraction	----	860 mg/kg	86.8	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	104	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	107	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2555884)							
ES1927361-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	76.0	70	130
EP080: BTEXN (QCLot: 2555884)							
ES1927361-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	83.6	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	85.6	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	89.4	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	89.4	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.2	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	88.2	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1927524**	Page	: 1 of 6
Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019
Site	: ----	Issue Date	: 04-Sep-2019
Sampler	: JACK ELLIS	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EG005(ED093)T: Total Metals by ICP-AES	ES1927565--003	Anonymous	**Chromium**	7440-47-3	35.4 %	0% - 20%	**RPD exceeds LOR based limits**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

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

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

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

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QS1A	**26-Aug-2019**	**----**	----	----	**02-Sep-2019**	09-Sep-2019	✓
Soil Glass Jar - Unpreserved (EA055) QS2A, QS3A	**27-Aug-2019**	**----**	----	----	**02-Sep-2019**	10-Sep-2019	✓
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200) QS1A	**26-Aug-2019**	**----**	----	----	**30-Aug-2019**	22-Feb-2020	✓
EA200N: Asbestos Quantification (non-NATA)							
Snap Lock Bag: Separate bag received (EA200N) QS1A	**26-Aug-2019**	**----**	----	----	**30-Aug-2019**	22-Feb-2020	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QS1A	**26-Aug-2019**	**02-Sep-2019**	22-Feb-2020	✓	**02-Sep-2019**	22-Feb-2020	✓
Soil Glass Jar - Unpreserved (EG005T) QS2A, QS3A	**27-Aug-2019**	**02-Sep-2019**	23-Feb-2020	✓	**02-Sep-2019**	23-Feb-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QS1A	**26-Aug-2019**	**02-Sep-2019**	23-Sep-2019	✓	**03-Sep-2019**	23-Sep-2019	✓
Soil Glass Jar - Unpreserved (EG035T) QS2A, QS3A	**27-Aug-2019**	**02-Sep-2019**	24-Sep-2019	✓	**03-Sep-2019**	24-Sep-2019	✓
EP035SF: Total Phenol by Segmented Flow Analyser							
Soil Glass Jar - Unpreserved (EP035SF) QS1A	**26-Aug-2019**	**02-Sep-2019**	09-Sep-2019	✓	**04-Sep-2019**	09-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP035SF) QS2A	**27-Aug-2019**	**02-Sep-2019**	10-Sep-2019	✓	**04-Sep-2019**	10-Sep-2019	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QS1A	**26-Aug-2019**	**02-Sep-2019**	09-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP075(SIM)) QS2A, QS3A	**27-Aug-2019**	**02-Sep-2019**	10-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) QS1A	**26-Aug-2019**	**02-Sep-2019**	09-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) QS1A	**26-Aug-2019**	**30-Aug-2019**	09-Sep-2019	✓	**02-Sep-2019**	09-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP071) QS2A, QS3A	**27-Aug-2019**	**02-Sep-2019**	10-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) QS2A, QS3A	**27-Aug-2019**	**30-Aug-2019**	10-Sep-2019	✓	**02-Sep-2019**	10-Sep-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071) QS1A	**26-Aug-2019**	**02-Sep-2019**	09-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) QS1A	**26-Aug-2019**	**30-Aug-2019**	09-Sep-2019	✓	**02-Sep-2019**	09-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP071) QS2A, QS3A	**27-Aug-2019**	**02-Sep-2019**	10-Sep-2019	✓	**03-Sep-2019**	12-Oct-2019	✓
Soil Glass Jar - Unpreserved (EP080) QS2A, QS3A	**27-Aug-2019**	**30-Aug-2019**	10-Sep-2019	✓	**02-Sep-2019**	10-Sep-2019	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QS1A	**26-Aug-2019**	**30-Aug-2019**	09-Sep-2019	✓	**02-Sep-2019**	09-Sep-2019	✓
Soil Glass Jar - Unpreserved (EP080) QS2A, QS3A	**27-Aug-2019**	**30-Aug-2019**	10-Sep-2019	✓	**02-Sep-2019**	10-Sep-2019	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phenol By Discrete Analyser	EP035SF	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phenol By Discrete Analyser	EP035SF	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phenol By Discrete Analyser	EP035SF	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phenol By Discrete Analyser	EP035SF	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Asbestos Classification and Quantitation per NEPM 2013	* EA200N	SOIL	Asbestos Classification and Quantitation per NEPM 2013 with Confirmation of Identification by AS 4964 - 2004 Gravimetric determination of Asbestos Containing Material, Fibrous Asbestos, Asbestos Fines and sample weight and calculation of percentage concentrations per NEPM protocols. Asbestos (Fines and Fibrous FA+AF) is reported as the equivalent weight in the sample received after accounting for sub-sampling (where applicable for the <7mm and/or <2mm fractions).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Total Phenol By Discrete Analyser	EP035SF	SOIL	In house: Referenced to ISO 14402. Phenols are extracted in 1M NaOH. The extract is diluted by 10 and then in-line-distilled at pH 1- 4. The distillate, containing steam-volatile phenolic compounds is then oxidised by hexacyanoferrate(III). The resulting quinones react with 4-aminoantipyrine forming red condensation products, which are measured spectrometrically in a flow spectrometer at 505 nm.. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)

Preparation Methods	Method	Matrix	Method Descriptions
Extraction for Total Phenols in soil	EP035-PR	SOIL	In house: Soil sub-sample is extracted in 1M NaOH by tumbling for between 6 and 16 hours. The resulting extract is diluted 10 times with reagent grade water prior to analysis.
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1927524**

Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mvanderheyden@traceenviro.com	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 19.13	Page	: 1 of 2
Order number	: ----	Quote number	: ----
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JACK ELLIS		

Dates

Date Samples Received	: 28-Aug-2019 17:30	Issue Date	: 30-Aug-2019
Client Requested Due Date	: 04-Sep-2019	Scheduled Reporting Date	: **04-Sep-2019**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 1.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- 30/8/19: This is an updated SRN which indicates the addition of total phenols as confirmed with Mat.
- **Phenols analysis has not been added as it is not clear if Speciated phenols or total phenols analysis is required.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EA055-103 Moisture Content	SOIL - EA200N Asbestos in Soils - (<1kg samples ONLY)	SOIL - EP035SF (solids) Total Phenol by Segmented Flow Analyser	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES1927524-001	26-Aug-2019 00:00	QS1A	✓	✓	✓	✓
ES1927524-002	27-Aug-2019 00:00	QS2A	✓		✓	✓
ES1927524-003	27-Aug-2019 00:00	QS3A	✓			✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	accounts@traceenviro.com

MATT VANDERHEYDEN

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

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 / ☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 / ☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 / ☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 / ☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: TRACE Environmental	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	☑ Standard TAT (List due date):Standard	FOR LABORATORY USE ONLY (Circle)
OFFICE: Sydney			Custody Seal Intact? Yes No (N/A)
PROJECT: 19.13	ALS QUOTE NO.:	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER:		COC: (1) 2 3 4 5 6 7	Random Sample Temperature on Receipt: 1-2 °C
PROJECT MANAGER: Matt Vanderheyden	CONTACT: 0401457535	OF: (1) 2 3 4 5 6 7	Other comment:

SAMPLER: Jack Ellis	SAMPLER MOBILE: 0452020300	RELINQUISHED BY: Jack Ellis	RECEIVED BY: [signature]	RELINQUISHED BY:	RECEIVED BY:
COC emailed to ALS? (YES / NO) Yes	EDD FORMAT (or default): default				
Email Reports to (will default to PM if no other addresses are listed):		DATE/TIME: 28/8/19	DATE/TIME: 28/8/19 1730	DATE/TIME:	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed):					

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S21	Metals	Phenols	Asbestos (quantification WA)				HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	QS1A	26/08/2019	Soil	Bag+Jar	2	X	X	X	X					
2	QS2A	27/08/2019	Soil	Bag+Jar	2	X	X	X						
3	QS3A	27/08/2019	Soil	Bag+Jar	2	X	X							
				TOTAL	6	3	3	2	1					

Sub Out / Forward Lab / Split WO
Lab / Analysis: Asbestos → Newcastle
Organised By / Date: ______________
Relinquished By / Date: ____________
Connote / Courier: ________________
WO No: ______________________
Attach By PO / Internal Sheet: ______

Environmental Division
Sydney
Work Order Reference
ES1927524
Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

eurofins | mgt

☑ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
Phone: +612 9900 8400
Email: EnviroSampleNSW@eurofins.com.au

☐ **Brisbane**
Unit 1-21 Smallwood Place, Murrarie
Phone: +617 3902 4600
Email: EnviroSampleQLD@eurofins.com.au

☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: EnviroSampleVic@eurofins.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name: TRACE Environmental	**Contact Name:** Matt Vanderhevden	**Purchase Order :** -	**COC Number :**
Office Address: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW	**Project Manager:** Matt Vanderhevden	**PROJECT Number :** 19.13	**Eurofins | mgt quote ID :**
	Email for results: mvanderhevden@traceenviro.com	**PROJECT Name :** Willoughby DSI	**Data output format:**

Special Directions & Comments :

Please email invoice to accounts@traceenviro.com & Proj Manager

Eurofins | mgt Of water batch number:

Analytes

	Sample ID	Date	Matrix	B7 - TPH/TRH, BTEXN, PAH, 8 metals	B7A - TPH/TRH, STEXN, PAH, 8 metals, phenol	B15 - OCP, OPP, PCB	VOCs	PFAS	sTPH/BTEXN	Electrical Conductivity	B21 - NEPM Screen	HOLD	Containers: 1LP	250P	Metals	PFAS	40mL vial	125mL A	Jar	Bag	Sample comments:
	MW1	2-09-2019	W		X	X	X	X							1	1	2	1			Metals Filtered
	MW2	2-09-2019	W		X	X	X	X							1	1	2	1			Metals Filtered
	MW3	2-09-2019	W		X	X	X	X							1	1	2	1			Metals Filtered
	MW4	2-09-2019	W		X	X	X	X							1	1	2	1			Metals Filtered
	QW1	2-09-2019	W		X										1	1	2	1			Metals Filtered
	RWB1	2-09-2019	W											X	1	1	2	1			Metals Total
	TS2	2-09-2019	W						X								2				
	TB2	2-09-2019	W						X								2				

Some common holding times (with correct preservation):
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Asbestos	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Laboratory Staff	Turn around time	Method Of Shipment	Temperature on arrival:
Relinquished By: AC	**Received By:**	☐ Courier ☑ Hand Delivered ☐ Postal	8.86°C
Date & Time: 2/9/19 15:15	**Date & Time:**	**Courier Consignment # :**	**Report number:** 614639
Signature:	**Signature:**		

Turn around time: 1 DAY ☐ 2 DAY ☐ 3 DAY ☐ 5 DAY ☑ 10 DAY ☐ Other:

Date/Time: 2/9/19 5:47PM

Chilled: (Yes) No

Temp: 9.5 9.0 9.6

Correction: -0.2

Final Temp: 9.3

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

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

Sample Receipt Advice

Company name:	**Trace Environmental P/L**
Contact name:	Matthew Vanderheyden
Project name:	WILLOUGHBY DSI
Project ID:	19.13
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 2, 2019 5:47 PM
Eurofins reference:	**674639**

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 Sample Receipt : 8.9 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.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ 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:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Matthew Vanderheyden - mvanderheyden@traceenviro.com.

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
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2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 674639
Phone: 02 8960 0555
Fax:

Received: Sep 2, 2019 5:47 PM
Due: Sep 9, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Eurofins | mgt Suite B15	Volatile Organics	Eurofins | mgt Suite B7A (filtered metals)	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	MW1	Sep 02, 2019		Water	S19-Se02374		X	X	X		X
2	MW2	Sep 02, 2019		Water	S19-Se02375		X	X	X		X
3	MW3	Sep 02, 2019		Water	S19-Se02376		X	X	X		X
4	MW4	Sep 02, 2019		Water	S19-Se02377		X	X	X		X
5	QW1	Sep 02, 2019		Water	S19-Se02378				X		
6	TS2	Sep 02, 2019		Water	S19-Se02379					X	
7	TB2	Sep 02, 2019		Water	S19-Se02380					X	
8	RBW1	Sep 02, 2019		Water	S19-Se02381	X					
Test Counts						1	4	4	5	2	4

Trace Environmental P/L
Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

NATA Accredited
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: **Matthew Vanderheyden**

Report **674639-W-V2**
Project name WILLOUGHBY DSI
Project ID 19.13
Received Date Sep 02, 2019

Client Sample ID			**MW1**	**MW2**	**MW3**	**MW4**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S19-Se02374**	**S19-Se02375**	**S19-Se02376**	**S19-Se02377**
Date Sampled			**Sep 02, 2019**	**Sep 02, 2019**	**Sep 02, 2019**	**Sep 02, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	113	98	109	105
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
Volatile Organics						
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	0.001	< 0.005	< 0.001	< 0.005
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
4-Bromofluorobenzene (surr.)	1	%	113	98	109	105
Toluene-d8 (surr.)	1	%	113	95	103	97

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	55	50	76	62
p-Terphenyl-d14 (surr.)	1	%	67	55	82	56
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Toxaphene	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Aldrin and Dieldrin (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
DDT + DDE + DDD (Total)*	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Vic EPA IWRG 621 OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vic EPA IWRG 621 Other OCP (Total)*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	86	66	101	52
Tetrachloro-m-xylene (surr.)	1	%	58	97	70	56

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Bolstar	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Chlorfenvinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Chlorpyrifos	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chlorpyrifos-methyl	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Coumaphos	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-S	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Demeton-O	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Diazinon	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dichlorvos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Dimethoate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Disulfoton	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
EPN	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethoprop	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ethyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fenitrothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fensulfothion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Fenthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Malathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Merphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methyl parathion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Mevinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Monocrotophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Naled	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Omethoate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Phorate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Pirimiphos-methyl	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Pyrazophos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Ronnel	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Terbufos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Tetrachlorvinphos	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Tokuthion	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Trichloronate	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Triphenylphosphate (surr.)	1	%	73	56	91	51
Polychlorinated Biphenyls						
Aroclor-1016	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1232	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1242	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1248	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1254	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Aroclor-1260	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PCB*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibutylchlorendate (surr.)	1	%	86	66	101	52
Tetrachloro-m-xylene (surr.)	1	%	58	97	70	56

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.6-Dichlorophenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Pentachlorophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
Total Halogenated Phenol*	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2-Nitrophenol	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2.4-Dimethylphenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
2.4-Dinitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	< 0.006	< 0.006	< 0.006
4-Nitrophenol	0.03	mg/L	< 0.03	< 0.03	< 0.03	< 0.03
Dinoseb	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Phenol-d6 (surr.)	1	%	41	29	60	34
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.004
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	0.0003	0.0048
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	0.033	0.026	0.017
Lead (filtered)	0.001	mg/L	< 0.001	0.007	0.002	0.019
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.003	0.014	0.037	0.072
Zinc (filtered)	0.005	mg/L	0.011	0.10	0.19	0.70
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	95	68	98	65
13C5-PFPeA (surr.)	1	%	148	109	149	103
13C5-PFHxA (surr.)	1	%	166	114	154	112
13C4-PFHpA (surr.)	1	%	125	102	139	110
13C8-PFOA (surr.)	1	%	129	109	141	104
13C5-PFNA (surr.)	1	%	130	108	149	88

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C6-PFDA (surr.)	1	%	121	95	117	54
13C2-PFUnDA (surr.)	1	%	134	127	120	62
13C2-PFDoDA (surr.)	1	%	72	78	68	41
13C2-PFTeDA (surr.)	1	%	40	85	45	48
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	96	66	86	60
D3-N-MeFOSA (surr.)	1	%	27	38	33	39
D5-N-EtFOSA (surr.)	1	%	17	30	24	29
D7-N-MeFOSE (surr.)	1	%	33	46	38	50
D9-N-EtFOSE (surr.)	1	%	26	37	38	30
D5-N-EtFOSAA (surr.)	1	%	46	37	30	17
D3-N-MeFOSAA (surr.)	1	%	42	41	29	14
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	0.01	0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	104	97	100	93
18O2-PFHxS (surr.)	1	%	117	95	112	98
13C8-PFOS (surr.)	1	%	114	103	109	76
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	103	114	181	80
13C2-6:2 FTSA (surr.)	1	%	113	112	194	136
13C2-8:2 FTSA (surr.)	1	%	92	77	INT	115

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S19-Se02374	S19-Se02375	S19-Se02376	S19-Se02377
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.01	0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.01	0.01	0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Client Sample ID			QW1	R20TS2	TB2
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S19-Se02378	S19-Se02379	S19-Se02380
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene[N02]	0.01	mg/L	< 0.01	88	< 0.01
TRH C6-C10	0.02	mg/L	< 0.02	94	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	-	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions					
TRH C6-C9	0.02	mg/L	< 0.02	88	< 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-C36 (Total)	0.1	mg/L	< 0.1	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	95	< 0.001
Toluene	0.001	mg/L	< 0.001	91	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	89	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	86	< 0.002
o-Xylene	0.001	mg/L	< 0.001	91	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	88	< 0.003
4-Bromofluorobenzene (surr.)	1	%	110	98	88
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	-	-
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	-	-

Client Sample ID			QW1	R20TS2	TB2
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S19-Se02378	S19-Se02379	S19-Se02380
Date Sampled			Sep 02, 2019	Sep 02, 2019	Sep 02, 2019
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
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	%	50	-	-
p-Terphenyl-d14 (surr.)	1	%	88	-	-
Phenols (Halogenated)					
2-Chlorophenol	0.003	mg/L	< 0.003	-	-
2.4-Dichlorophenol	0.003	mg/L	< 0.003	-	-
2.4.5-Trichlorophenol	0.01	mg/L	< 0.01	-	-
2.4.6-Trichlorophenol	0.01	mg/L	< 0.01	-	-
2.6-Dichlorophenol	0.003	mg/L	< 0.003	-	-
4-Chloro-3-methylphenol	0.01	mg/L	< 0.01	-	-
Pentachlorophenol	0.01	mg/L	< 0.01	-	-
Tetrachlorophenols - Total	0.03	mg/L	< 0.03	-	-
Total Halogenated Phenol*	0.01	mg/L	< 0.01	-	-
Phenols (non-Halogenated)					
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	< 0.1	-	-
2-Methyl-4.6-dinitrophenol	0.03	mg/L	< 0.03	-	-
2-Methylphenol (o-Cresol)	0.003	mg/L	< 0.003	-	-
2-Nitrophenol	0.01	mg/L	< 0.01	-	-
2.4-Dimethylphenol	0.003	mg/L	< 0.003	-	-
2.4-Dinitrophenol	0.03	mg/L	< 0.03	-	-
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	< 0.006	-	-
4-Nitrophenol	0.03	mg/L	< 0.03	-	-
Dinoseb	0.1	mg/L	< 0.1	-	-
Phenol	0.003	mg/L	< 0.003	-	-
Total Non-Halogenated Phenol*	0.1	mg/L	< 0.1	-	-
Phenol-d6 (surr.)	1	%	28	-	-
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	0.018	-	-
Lead (filtered)	0.001	mg/L	0.001	-	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	-	-
Nickel (filtered)	0.001	mg/L	0.014	-	-
Zinc (filtered)	0.005	mg/L	0.070	-	-

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.

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 - 2013 NEPM Fractions	Melbourne	Sep 05, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Melbourne	Sep 05, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 11, 2019	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Sep 11, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Eurofins | mgt Suite B7A (filtered metals)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 09, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8 filtered	Melbourne	Sep 05, 2019	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Volatile Organics	Melbourne	Sep 05, 2019	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices (USEPA 8260)			
Eurofins | mgt Suite B15			
Organochlorine Pesticides	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)			
Polychlorinated Biphenyls	Melbourne	Sep 09, 2019	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Brisbane	Sep 04, 2019	14 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Brisbane	Sep 04, 2019	14 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Brisbane	Sep 04, 2019	14 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Brisbane	Sep 04, 2019	14 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins | Environment Testing

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Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 674639
Phone: 02 8960 0555
Fax:

Received: Sep 2, 2019 5:47 PM
Due: Sep 9, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						HOLD	Eurofins | mgt Suite B15	Volatile Organics	Eurofins | mgt Suite B7A (filtered metals)	BTEXN and Volatile TRH	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											X
Perth Laboratory - NATA Site # 23736											
External Laboratory											
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**						
1	MW1	Sep 02, 2019		Water	S19-Se02374		X	X	X		X
2	MW2	Sep 02, 2019		Water	S19-Se02375		X	X	X		X
3	MW3	Sep 02, 2019		Water	S19-Se02376		X	X	X		X
4	MW4	Sep 02, 2019		Water	S19-Se02377		X	X	X		X
5	QW1	Sep 02, 2019		Water	S19-Se02378				X		
6	TS2	Sep 02, 2019		Water	S19-Se02379					X	
7	TB2	Sep 02, 2019		Water	S19-Se02380					X	
8	RBW1	Sep 02, 2019		Water	S19-Se02381	X					
Test Counts						1	4	4	5	2	4

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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 - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
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							
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							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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	
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							
Organophosphorus Pesticides							
Azinphos-methyl	mg/L	< 0.002			0.002	Pass	
Bolstar	mg/L	< 0.002			0.002	Pass	
Chlorfenvinphos	mg/L	< 0.002			0.002	Pass	
Chlorpyrifos	mg/L	< 0.02			0.02	Pass	
Chlorpyrifos-methyl	mg/L	< 0.002			0.002	Pass	
Coumaphos	mg/L	< 0.02			0.02	Pass	
Demeton-S	mg/L	< 0.02			0.02	Pass	
Demeton-O	mg/L	< 0.002			0.002	Pass	
Diazinon	mg/L	< 0.002			0.002	Pass	
Dichlorvos	mg/L	< 0.002			0.002	Pass	
Dimethoate	mg/L	< 0.002			0.002	Pass	
Disulfoton	mg/L	< 0.002			0.002	Pass	
EPN	mg/L	< 0.002			0.002	Pass	
Ethion	mg/L	< 0.002			0.002	Pass	
Ethoprop	mg/L	< 0.002			0.002	Pass	
Ethyl parathion	mg/L	< 0.002			0.002	Pass	
Fenitrothion	mg/L	< 0.002			0.002	Pass	
Fensulfothion	mg/L	< 0.002			0.002	Pass	
Fenthion	mg/L	< 0.002			0.002	Pass	
Malathion	mg/L	< 0.002			0.002	Pass	
Merphos	mg/L	< 0.002			0.002	Pass	
Methyl parathion	mg/L	< 0.002			0.002	Pass	
Mevinphos	mg/L	< 0.002			0.002	Pass	
Monocrotophos	mg/L	< 0.002			0.002	Pass	
Naled	mg/L	< 0.002			0.002	Pass	
Omethoate	mg/L	< 0.002			0.002	Pass	
Phorate	mg/L	< 0.002			0.002	Pass	
Pirimiphos-methyl	mg/L	< 0.02			0.02	Pass	
Pyrazophos	mg/L	< 0.002			0.002	Pass	
Ronnel	mg/L	< 0.002			0.002	Pass	
Terbufos	mg/L	< 0.002			0.002	Pass	
Tetrachlorvinphos	mg/L	< 0.002			0.002	Pass	
Tokuthion	mg/L	< 0.002			0.002	Pass	
Trichloronate	mg/L	< 0.002			0.002	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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.03			0.03	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.01			0.01	Pass	
2.4-Dimethylphenol	mg/L	< 0.003			0.003	Pass	
2.4-Dinitrophenol	mg/L	< 0.03			0.03	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	< 0.03			0.03	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	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	< 0.005			0.005	Pass	
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	103			70-130	Pass	
Naphthalene	%	101			70-130	Pass	
TRH C6-C10	%	114			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	75			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	113			70-130	Pass	
TRH C10-C14	%	81			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	96			70-130	Pass	
Toluene	%	99			70-130	Pass	
Ethylbenzene	%	95			70-130	Pass	
m&p-Xylenes	%	95			70-130	Pass	
Xylenes - Total	%	95			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	93			70-130	Pass	
1.1.1-Trichloroethane	%	75			70-130	Pass	
1.2-Dichlorobenzene	%	90			70-130	Pass	
1.2-Dichloroethane	%	79			70-130	Pass	
Benzene	%	100			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	107			70-130	Pass	
Toluene	%	100			70-130	Pass	
Trichloroethene	%	79			70-130	Pass	
Xylenes - Total	%	107			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	98			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthylene	%	91			70-130	Pass	
Anthracene	%	82			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	89			70-130	Pass	
Benzo(b&j)fluoranthene	%	87			70-130	Pass	
Benzo(g.h.i)perylene	%	83			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	109			70-130	Pass	
Dibenz(a.h)anthracene	%	80			70-130	Pass	
Fluoranthene	%	91			70-130	Pass	
Fluorene	%	96			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	93			70-130	Pass	
Phenanthrene	%	99			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	87			70-130	Pass	
4.4'-DDD	%	103			70-130	Pass	
4.4'-DDE	%	106			70-130	Pass	
4.4'-DDT	%	82			70-130	Pass	
a-BHC	%	116			70-130	Pass	
Aldrin	%	106			70-130	Pass	
b-BHC	%	105			70-130	Pass	
d-BHC	%	108			70-130	Pass	
Dieldrin	%	98			70-130	Pass	
Endosulfan I	%	105			70-130	Pass	
Endosulfan II	%	97			70-130	Pass	
Endosulfan sulphate	%	76			70-130	Pass	
Endrin	%	83			70-130	Pass	
Endrin aldehyde	%	101			70-130	Pass	
Endrin ketone	%	75			70-130	Pass	
g-BHC (Lindane)	%	122			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Heptachlor epoxide	%	83			70-130	Pass	
Hexachlorobenzene	%	113			70-130	Pass	
Methoxychlor	%	96			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	98			70-130	Pass	
Dimethoate	%	74			70-130	Pass	
Ethion	%	82			70-130	Pass	
Fenitrothion	%	86			70-130	Pass	
Methyl parathion	%	85			70-130	Pass	
Mevinphos	%	86			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	115			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	81			30-130	Pass	
2.4-Dichlorophenol	%	79			30-130	Pass	
2.4.5-Trichlorophenol	%	71			30-130	Pass	
2.4.6-Trichlorophenol	%	70			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.6-Dichlorophenol	%	88			30-130	Pass	
4-Chloro-3-methylphenol	%	73			30-130	Pass	
Pentachlorophenol	%	49			30-130	Pass	
Tetrachlorophenols - Total	%	106			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	70			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	50			30-130	Pass	
2-Methylphenol (o-Cresol)	%	63			30-130	Pass	
2-Nitrophenol	%	88			30-130	Pass	
2.4-Dimethylphenol	%	76			30-130	Pass	
2.4-Dinitrophenol	%	43			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	57			30-130	Pass	
4-Nitrophenol	%	101			30-130	Pass	
Dinoseb	%	59			30-130	Pass	
Phenol	%	43			30-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	98			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	122			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	99			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	96			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	91			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	95			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	81			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	79			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	69			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	%	104			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	92			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	105			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	66			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	102			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	98			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	90			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	80			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	%	106			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M19-Se06799	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M19-Se06799	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	M19-Se06799	NCP	%	93			70-130	Pass	
Cadmium (filtered)	M19-Se06799	NCP	%	93			70-130	Pass	
Chromium (filtered)	M19-Se06799	NCP	%	95			70-130	Pass	
Copper (filtered)	M19-Se06799	NCP	%	92			70-130	Pass	
Lead (filtered)	M19-Se06799	NCP	%	91			70-130	Pass	
Mercury (filtered)	M19-Se06799	NCP	%	91			70-130	Pass	
Nickel (filtered)	M19-Se06799	NCP	%	92			70-130	Pass	
Zinc (filtered)	M19-Se06799	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	B19-Se06508	NCP	%	89			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	B19-Se06508	NCP	%	102			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	B19-Se06508	NCP	%	90			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	B19-Se06508	NCP	%	83			50-150	Pass	
Perfluorooctanoic acid (PFOA)	B19-Se06508	NCP	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	B19-Se06508	NCP	%	92			50-150	Pass	
Perfluorodecanoic acid (PFDA)	B19-Se06508	NCP	%	102			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	B19-Se06508	NCP	%	88			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	B19-Se06508	NCP	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	B19-Se06508	NCP	%	91			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	B19-Se06508	NCP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	B19-Se06508	NCP	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	B19-Se06508	NCP	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	B19-Se06508	NCP	%	76			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	B19-Se06508	NCP	%	104			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	B19-Se06508	NCP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	B19-Se06508	NCP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	B19-Se06508	NCP	%	90			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	B19-Se06508	NCP	%	96			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	B19-Se06508	NCP	%	110			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	B19-Se06508	NCP	%	86			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorohexanesulfonic acid (PFHxS)	B19-Se06508	NCP	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	B19-Se06508	NCP	%	87			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	B19-Se06508	NCP	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	B19-Se06508	NCP	%	75			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	B19-Se06508	NCP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	B19-Se06508	NCP	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	B19-Se06508	NCP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	B19-Se06508	NCP	%	116			50-150	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M19-Se05393	NCP	%	114			70-130	Pass	
Acenaphthylene	M19-Se05393	NCP	%	117			70-130	Pass	
Anthracene	M19-Se05393	NCP	%	116			70-130	Pass	
Benz(a)anthracene	M19-Se05393	NCP	%	113			70-130	Pass	
Benzo(a)pyrene	M19-Se05393	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Se05393	NCP	%	109			70-130	Pass	
Benzo(g.h.i)perylene	M19-Se05393	NCP	%	100			70-130	Pass	
Benzo(k)fluoranthene	M19-Se05393	NCP	%	116			70-130	Pass	
Chrysene	M19-Se05393	NCP	%	122			70-130	Pass	
Dibenz(a.h)anthracene	M19-Se05393	NCP	%	93			70-130	Pass	
Fluoranthene	M19-Se05393	NCP	%	113			70-130	Pass	
Fluorene	M19-Se05393	NCP	%	118			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se05393	NCP	%	96			70-130	Pass	
Naphthalene	M19-Se05393	NCP	%	117			70-130	Pass	
Phenanthrene	M19-Se05393	NCP	%	117			70-130	Pass	
Pyrene	M19-Se05393	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Phenols (Halogenated)				Result 1					
2-Chlorophenol	M19-Se05393	NCP	%	89			30-130	Pass	
2.4-Dichlorophenol	M19-Se05393	NCP	%	86			30-130	Pass	
2.4.5-Trichlorophenol	M19-Se05393	NCP	%	128			30-130	Pass	
2.4.6-Trichlorophenol	M19-Se05393	NCP	%	121			30-130	Pass	
2.6-Dichlorophenol	M19-Se05393	NCP	%	88			30-130	Pass	
4-Chloro-3-methylphenol	M19-Se05393	NCP	%	90			30-130	Pass	
Pentachlorophenol	M19-Se05393	NCP	%	106			30-130	Pass	
Tetrachlorophenols - Total	M19-Se05393	NCP	%	123			30-130	Pass	
Spike - % Recovery									
Phenols (non-Halogenated)				Result 1					
2-Cyclohexyl-4.6-dinitrophenol	M19-Se05393	NCP	%	75			30-130	Pass	
2-Methyl-4.6-dinitrophenol	M19-Se05393	NCP	%	120			30-130	Pass	
2-Methylphenol (o-Cresol)	M19-Se05393	NCP	%	87			30-130	Pass	
2-Nitrophenol	M19-Se05393	NCP	%	93			30-130	Pass	
2.4-Dimethylphenol	M19-Se05393	NCP	%	91			30-130	Pass	
2.4-Dinitrophenol	M19-Se05393	NCP	%	111			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
3&4-Methylphenol (m&p-Cresol)	M19-Se05393	NCP	%	85			30-130	Pass	
4-Nitrophenol	M19-Se05393	NCP	%	108			30-130	Pass	
Dinoseb	M19-Se05393	NCP	%	102			30-130	Pass	
Phenol	M19-Se05393	NCP	%	80			30-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Se04105	NCP	%	105			70-130	Pass	
TRH C6-C10	M19-Se04105	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Se04105	NCP	%	105			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Se04105	NCP	%	107			70-130	Pass	
Toluene	M19-Se04105	NCP	%	113			70-130	Pass	
Ethylbenzene	M19-Se04105	NCP	%	108			70-130	Pass	
m&p-Xylenes	M19-Se04105	NCP	%	107			70-130	Pass	
o-Xylene	M19-Se04105	NCP	%	109			70-130	Pass	
Xylenes - Total	M19-Se04105	NCP	%	108			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M19-Se07854	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	M19-Se07854	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	M19-Se07854	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	M19-Se07854	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	M19-Se07854	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	M19-Se07854	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	M19-Se06799	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
Cadmium (filtered)	M19-Se06799	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M19-Se06799	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M19-Se06799	NCP	mg/L	0.013	0.014	2.0	30%	Pass	
Lead (filtered)	M19-Se06799	NCP	mg/L	0.001	< 0.001	11	30%	Pass	
Mercury (filtered)	M19-Se06799	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	M19-Se06799	NCP	mg/L	0.018	0.018	<1	30%	Pass	
Zinc (filtered)	M19-Se06799	NCP	mg/L	0.081	0.083	2.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Au44469	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4.4'-DDD	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDE	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
4.4'-DDT	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
a-BHC	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Aldrin	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
b-BHC	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
d-BHC	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dieldrin	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan I	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan II	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endosulfan sulphate	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin aldehyde	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Endrin ketone	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
g-BHC (Lindane)	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Heptachlor epoxide	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Hexachlorobenzene	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Methoxychlor	M19-Au44469	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Bolstar	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorfenvinphos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Chlorpyrifos	M19-Au44469	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chlorpyrifos-methyl	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Coumaphos	M19-Au44469	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-S	M19-Au44469	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Demeton-O	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Diazinon	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dichlorvos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Dimethoate	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Disulfoton	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
EPN	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethoprop	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ethyl parathion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenitrothion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fensulfothion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Fenthion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Malathion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Merphos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Methyl parathion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Mevinphos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Monocrotophos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Naled	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Omethoate	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Phorate	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Pirimiphos-methyl	M19-Au44469	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Pyrazophos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Ronnel	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Terbufos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tetrachlorvinphos	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Tokuthion	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Trichloronate	M19-Au44469	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dichlorophenol	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4.5-Trichlorophenol	M19-Au44469	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4.6-Trichlorophenol	M19-Au44469	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.6-Dichlorophenol	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
4-Chloro-3-methylphenol	M19-Au44469	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Pentachlorophenol	M19-Au44469	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Tetrachlorophenols - Total	M19-Au44469	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	M19-Au44469	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	M19-Au44469	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
2-Methylphenol (o-Cresol)	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2-Nitrophenol	M19-Au44469	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2.4-Dimethylphenol	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
2.4-Dinitrophenol	M19-Au44469	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Au44469	NCP	mg/L	< 0.006	< 0.006	<1	30%	Pass	
4-Nitrophenol	M19-Au44469	NCP	mg/L	< 0.03	< 0.03	<1	30%	Pass	
Dinoseb	M19-Au44469	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Phenol	M19-Au44469	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol (N-MeFOSE)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol (N-EtFOSE)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid (6:2 FTSA)	S19-Se02377	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S19-Se02377	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Se07083	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	M19-Se07083	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M19-Se07083	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Se07083	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M19-Se07083	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M19-Se07083	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M19-Se07083	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M19-Se07083	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M19-Se07083	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

This report has been revised (V2) to report repeat results for sample 19-Se02374.

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
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Alena Bounkeua	Analytical Services Manager
Bryan Wilson	Senior Analyst-PFAS (QLD)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

General 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1928089**	Page	: 1 of 6
Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 03-Sep-2019 12:45
Order number	:	Date Analysis Commenced	: 04-Sep-2019
C-O-C number	: ----	Issue Date	: 10-Sep-2019 13:16
Sampler	: ANDREW CARRAS		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QW1A	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928089-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.002**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**0.006**	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QW1A	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928089-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**30.0**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	QW1A	----	----	----	----
				Client sampling date / time	02-Sep-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928089-001	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
2-Chlorophenol-D4	93951-73-6	1.0	%		69.1	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		58.3	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		82.5	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		82.5	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		66.6	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		101	----	----	----	----
Toluene-D8	2037-26-5	2	%		100	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		101	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES1928089**	Page	: 1 of 6
Client	: TRACE ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 03-Sep-2019
Order number	:	Date Analysis Commenced	: 04-Sep-2019
C-O-C number	: ----	Issue Date	: 10-Sep-2019
Sampler	: ANDREW CARRAS		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2569876)									
ES1928542-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2569877)									
ES1928369-007	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2563311)									
EB1922804-003	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EW1903806-021	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2563311)									
EB1922804-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EW1903806-021	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 2563311)									
EB1922804-003	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
EW1903806-021	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 2563311) - continued									
EW1903806-021	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2569876)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	92.8	85	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	91.7	84	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.7	85	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.5	81	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.0	83	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	87.9	82	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.6	81	117
EG035F: Dissolved Mercury by FIMS (QCLot: 2569877)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	89.9	83	105
EP075(SIM)A: Phenolic Compounds (QCLot: 2561818)								
EP075(SIM): Phenol	108-95-2	1	µg/L	<1.0	5 µg/L	33.5	25	62
EP075(SIM): 2-Chlorophenol	95-57-8	1	µg/L	<1.0	5 µg/L	67.7	52	90
EP075(SIM): 2-Methylphenol	95-48-7	1	µg/L	<1.0	5 µg/L	77.1	51	91
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	10 µg/L	66.5	44	88
EP075(SIM): 2-Nitrophenol	88-75-5	1	µg/L	<1.0	5 µg/L	74.6	48	100
EP075(SIM): 2.4-Dimethylphenol	105-67-9	1	µg/L	<1.0	5 µg/L	75.1	49	99
EP075(SIM): 2.4-Dichlorophenol	120-83-2	1	µg/L	<1.0	5 µg/L	66.9	53	105
EP075(SIM): 2.6-Dichlorophenol	87-65-0	1	µg/L	<1.0	5 µg/L	74.0	57	105
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	5 µg/L	75.3	53	99
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	1	µg/L	<1.0	5 µg/L	71.4	50	106
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	1	µg/L	<1.0	5 µg/L	81.4	51	105
EP075(SIM): Pentachlorophenol	87-86-5	2	µg/L	<2.0	10 µg/L	45.8	10	95
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2561818)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	74.4	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	69.0	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	69.9	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	70.9	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	70.7	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	67.3	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	81.5	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	82.5	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	67.7	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	68.0	63	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2561818) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	72.2	62	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	69.4	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	75.8	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	76.1	60	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	78.0	61	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	75.0	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2561816)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	63.2	56	112
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	75.6	72	113
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	76.5	56	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2563311)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	98.4	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2561816)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	66.7	58	119
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	77.0	63	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	67.5	62	121
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2563311)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	97.5	75	127
EP080: BTEXN (QCLot: 2563311)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	92.2	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	98.8	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	100	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	96.9	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	98.8	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	94.4	70	120

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2569876)							
ES1928542-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	91.5	70	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	93.5	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2569876) - continued							
ES1928542-002	Anonymous	EG020A-F: Chromium	7440-47-3	1 mg/L	93.2	70	130
		EG020A-F: Copper	7440-50-8	1 mg/L	88.2	70	130
		EG020A-F: Lead	7439-92-1	1 mg/L	85.6	70	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	90.2	70	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	92.8	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2569877)							
ES1928089-001	QW1A	EG035F: Mercury	7439-97-6	0.01 mg/L	78.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2563311)							
EB1922804-003	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	91.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2563311)							
EB1922804-003	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	91.6	70	130
EP080: BTEXN (QCLot: 2563311)							
EB1922804-003	Anonymous	EP080: Benzene	71-43-2	25 µg/L	82.9	70	130
		EP080: Toluene	108-88-3	25 µg/L	90.5	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	94.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	92.5	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	94.1	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	96.8	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1928089**	Page	: 1 of 5
Client	: TRACE ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 03-Sep-2019
Site	: ----	Issue Date	: 10-Sep-2019
Sampler	: ANDREW CARRAS	No. of samples received	: 1
Order number	:	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

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

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

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

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / *Container / Client Sample ID(s)*	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F)							
QW1A	**02-Sep-2019**	**----**	----	----	**06-Sep-2019**	29-Feb-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F)							
QW1A	**02-Sep-2019**	**----**	----	----	**09-Sep-2019**	30-Sep-2019	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QW1A	**02-Sep-2019**	**04-Sep-2019**	09-Sep-2019	✓	**05-Sep-2019**	14-Oct-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
QW1A	**02-Sep-2019**	**04-Sep-2019**	09-Sep-2019	✓	**05-Sep-2019**	14-Oct-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
QW1A	**02-Sep-2019**	**04-Sep-2019**	09-Sep-2019	✓	**05-Sep-2019**	14-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QW1A	**02-Sep-2019**	**05-Sep-2019**	16-Sep-2019	✓	**05-Sep-2019**	16-Sep-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071)							
QW1A	**02-Sep-2019**	**04-Sep-2019**	09-Sep-2019	✓	**05-Sep-2019**	14-Oct-2019	✓
Amber VOC Vial - Sulfuric Acid (EP080)							
QW1A	**02-Sep-2019**	**05-Sep-2019**	16-Sep-2019	✓	**05-Sep-2019**	16-Sep-2019	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
QW1A	**02-Sep-2019**	**05-Sep-2019**	16-Sep-2019	✓	**05-Sep-2019**	16-Sep-2019	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1928089**

Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mvanderheyden@traceenviro.com	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 19.13	Page	: 1 of 2
Order number	:	Quote number	: ES2018TRAENV0003 (EN/222 (Sydney Batches))
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: ANDREW CARRAS		

Dates

Date Samples Received	: 03-Sep-2019 12:45	Issue Date	: 03-Sep-2019
Client Requested Due Date	: 10-Sep-2019	Scheduled Reporting Date	: **10-Sep-2019**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-27 TRH/BTEXN/PAH/Phenols/8 Metals
ES1928089-001	02-Sep-2019 00:00	QW1A	✓

Proactive Holding Time Report

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

Requested Deliverables

ANDREW KITA

- A4 - AU Tax Invoice (INV)	Email	andrew@traceenviro.com

MATT VANDERHEYDEN

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

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: TRACE Environmental

OFFICE: Sydney

PROJECT: 19.13

ORDER NUMBER:

PROJECT MANAGER: Matt Vanderheyden — CONTACT: 0401457535

SAMPLER: Andrew Carras — SAMPLER MOBILE: 0430276466

COC emailed to ALS? (YES / NO) Yes — EDD FORMAT (or default): default

Email Reports to (will default to PM if no other addresses are listed):

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics) ☐ Standard TAT (List due date):Standard

ALS QUOTE NO.:

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

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
AC	MASI		
DATE/TIME: 2/9/19 15:15	DATE/TIME: 3/9/19 12:45	DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).									Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	W-27	Metals	Phenols	Asbestos (quantification WA)					HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	QW1A	02-09-19	W	2x 40mL vials, 1x glass amber, 1x metals, 1x PFAS Bottle	5	X									metals filtered
				TOTAL	5										

Environmental Division
Sydney
Work Order Reference
ES1928089
Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic

Enviro Sample Vic

From: Alena Bounkeua
Sent: Thursday, 5 September 2019 2:35 PM
To: Enviro Sample Vic
Subject: FW: TCLP request - 673733
Attachments: 673733_summary.pdf

Additional analysis please – standard TAT

Kind Regards,

Alena Bounkeua
Eurofins|Environment Testing
Phone: +61 2 9900 8414
Mobile: +61 429 365 410
Email: AlenaBounkeua@eurofins.com

From: Matt Vanderheyden [mailto:mvanderheyden@traceenviro.com]
Sent: Thursday, 5 September 2019 2:25 PM
To: Alena Bounkeua
Cc: Dilmi Herath
Subject: TCLP request - 673733

EXTERNAL EMAIL*

Hi Alena,

Could I please request the following TCLP analysis for samples from this batch:

- SB18_0.1 – benzo(a)pyrene
- SB18_0.5 – benzo(a)pyrene
- SB5_0.1 – Pb
- SB8_0.1 – Pb
- SB13_0.1 – Pb

D.S 27/08
Au41195 - 41177 - 79
Au41196 -
Au41173 -
Au41178 -
Au41187 -

Regards,

TRACE ENVIRONMENTAL

Matthew Vanderheyden
Senior Environmental Scientist
TRACE Environmental
02 8960 0555 ■ 0401 457 535
Shop 2, 793-799 New Canterbury Road
Dulwich Hill NSW 2203
www.traceenviro.com ✉ mvanderheyden@traceenviro.com

675404
Adlin BP
5/9/19, 2:25pm

eurofins | Environment Testing

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

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

Sample Receipt Advice

Company name:	**Trace Environmental P/L**
Contact name:	Matthew Vanderheyden
Project name:	WILLOUGHBY DSI
Project ID:	19.13
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 5, 2019 2:25 PM
Eurofins reference:	**675404**

Sample information

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

☑ 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.

☒ Split sample sent to requested external lab.

☒ 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:

Alena Bounkeua on Phone : or by e.mail: AlenaBounkeua@eurofins.com

Results will be delivered electronically via e.mail to Matthew Vanderheyden - mvanderheyden@traceenviro.com.

eurofins | Environment Testing

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

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 675404
Phone: 02 8960 0555
Fax:

Received: Sep 5, 2019 2:25 PM
Due: Sep 12, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Benzo(a)pyrene	Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SB18_0.1	Aug 27, 2019		US Leachate	M19-Se07877	X		X
2	SB18_0.5	Aug 27, 2019		US Leachate	M19-Se07878	X		X
3	SB5_0.1	Aug 27, 2019		US Leachate	M19-Se07879		X	X
4	SB8_0.1	Aug 27, 2019		US Leachate	M19-Se07880		X	X
5	SB13_0.1	Aug 27, 2019		US Leachate	M19-Se07881		X	X
Test Counts						2	3	5

Trace Environmental P/L
Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

NATA Accredited
Accreditation Number 1261
Site Number 1254

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: **Matthew Vanderheyden**

Report **675404-L**
Project name WILLOUGHBY DSI
Project ID 19.13
Received Date Sep 05, 2019

Client Sample ID			**SB18_0.1**	**SB18_0.5**	**SB5_0.1**	**SB8_0.1**
Sample Matrix			**US Leachate**	**US Leachate**	**US Leachate**	**US Leachate**
Eurofins Sample No.			**M19-Se07877**	**M19-Se07878**	**M19-Se07879**	**M19-Se07880**
Date Sampled			**Aug 27, 2019**	**Aug 27, 2019**	**Aug 27, 2019**	**Aug 27, 2019**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Heavy Metals						
Lead	0.01	mg/L	-	-	0.10	0.11
USA Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.3	6.3	6.4	6.1
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	4.9	5.0	5.0	5.0
pH (USA HCl addition)	0.1	pH Units	1.6	1.6	1.7	1.6

Client Sample ID			**SB13_0.1**
Sample Matrix			**US Leachate**
Eurofins Sample No.			**M19-Se07881**
Date Sampled			**Aug 27, 2019**
Test/Reference	LOR	Unit	
Heavy Metals			
Lead	0.01	mg/L	0.62
USA Leaching Procedure			
Leachate Fluid[C01]		comment	1.0
pH (initial)	0.1	pH Units	5.9
pH (Leachate fluid)	0.1	pH Units	5.1
pH (off)	0.1	pH Units	5.0
pH (USA HCl addition)	0.1	pH Units	1.5

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.

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
Polycyclic Aromatic Hydrocarbons	Melbourne	Sep 06, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Heavy Metals	Melbourne	Sep 05, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Trace Environmental P/L
Address: Shop 2, 793-799 New Canterbury Road
Dulwich Hill
NSW 2203

Project Name: WILLOUGHBY DSI
Project ID: 19.13

Order No.:
Report #: 675404
Phone: 02 8960 0555
Fax:

Received: Sep 5, 2019 2:25 PM
Due: Sep 12, 2019
Priority: 5 Day
Contact Name: Matthew Vanderheyden

Eurofins Analytical Services Manager : Alena Bounkeua

Sample Detail						Benzo(a)pyrene	Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SB18_0.1	Aug 27, 2019		US Leachate	M19-Se07877	X		X
2	SB18_0.5	Aug 27, 2019		US Leachate	M19-Se07878	X		X
3	SB5_0.1	Aug 27, 2019		US Leachate	M19-Se07879		X	X
4	SB8_0.1	Aug 27, 2019		US Leachate	M19-Se07880		X	X
5	SB13_0.1	Aug 27, 2019		US Leachate	M19-Se07881		X	X
Test Counts						2	3	5

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. 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 SRA.

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.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****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 and 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.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
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 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

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	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Benzo(a)pyrene	M19-Au44656	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M19-Se08058	NCP	%	129			75-125	Fail	Q08
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(a)pyrene	M19-Au44655	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M19-Se08058	NCP	mg/L	0.04	0.04	1.0	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
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Authorised By

Alena Bounkeua	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1928640**	Page	: 1 of 4
Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019 17:30
Order number	: ----	Date Analysis Commenced	: 11-Sep-2019
C-O-C number	: ----	Issue Date	: 12-Sep-2019 17:49
Sampler	: Jack Ellis		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QS3A	----	----	----	----
				Client sampling date / time	27-Aug-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1928640-001	--------	--------	--------	--------
					Result	----	----	----	----
EN33: TCLP Leach									
Initial pH	----	0.1	pH Unit		**7.5**	----	----	----	----
After HCl pH	----	0.1	pH Unit		**1.6**	----	----	----	----
Extraction Fluid Number	----	1	-		**1**	----	----	----	----
Final pH	----	0.1	pH Unit		**5.2**	----	----	----	----

Analytical Results

Sub-Matrix: **TCLP LEACHATE** (Matrix: **WATER**)				Client sample ID	**QS3A**	**----**	**----**	**----**	**----**
				Client sampling date / time	27-Aug-2019 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1928640-001**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EG005(ED093)C: Leachable Metals by ICPAES									
Nickel	7440-02-0	0.1	mg/L		<0.1	**----**	**----**	**----**	**----**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1928640**	Page	: 1 of 3
Client	: TRACE ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019
Order number	: ----	Date Analysis Commenced	: 11-Sep-2019
C-O-C number	: ----	Issue Date	: 12-Sep-2019
Sampler	: Jack Ellis		
Site	: ----		
Quote number	: EN/222 (Sydney Batches)		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)C: Leachable Metals by ICPAES (QC Lot: 2580508)									
ES1928494-001	Anonymous	EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	<0.1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EN33: TCLP Leach (QCLot: 2576483)								
EN33a: Initial pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: After HCl pH	----	0.1	pH Unit	1.0	----	----	----	----
EN33a: Final pH	----	0.1	pH Unit	1.0	----	----	----	----

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 2580508)								
EG005C: Nickel	7440-02-0	0.1	mg/L	<0.1	0.1 mg/L	99.6	83	115

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)C: Leachable Metals by ICPAES (QCLot: 2580508)							
ES1928640-001	QS3A	EG005C: Nickel	7440-02-0	1 mg/L	106	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1928640**	Page	: 1 of 4
Client	: TRACE ENVIRONMENTAL PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Telephone	: +61-2-8784 8555
Project	: 19.13	Date Samples Received	: 28-Aug-2019
Site	: ----	Issue Date	: 12-Sep-2019
Sampler	: Jack Ellis	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

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

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

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

Matrix: **SOIL** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EN33: TCLP Leach							
Non-Volatile Leach: 180 day HT (e.g. PFAS, metals ex.Hg) (EN33a)							
QS3A	**27-Aug-2019**	**11-Sep-2019**	23-Feb-2020	✓	**----**	----	----

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005(ED093)C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG005C)							
QS3A	**11-Sep-2019**	**12-Sep-2019**	09-Mar-2020	✓	**12-Sep-2019**	09-Mar-2020	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Method Blanks (MB)							
TCLP for Non & Semivolatile Analytes	EN33a	1	11	**9.09**	**9.09**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Leachable Metals by ICPAES	EG005C	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Leachable Metals by ICPAES	EG005C	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Leachable Metals by ICPAES	EG005C	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Leachable Metals by ICPAES	EG005C	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Leachable Metals by ICPAES	EG005C	SOIL	In house: referenced to APHA 3120; USEPA SW 846 - 6010: The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals in TCLP Leachate	EN25C	SOIL	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
TCLP for Non & Semivolatile Analytes	EN33a	SOIL	In house QWI-EN/33 referenced to USEPA SW846-1311: The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1928640**

Client	: **TRACE ENVIRONMENTAL PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Mr MATT VANDERHEYDEN	Contact	: Customer Services ES
Address	: Shop 2, 793-799 New Canterbury Road, Dulwich Hill, NSW 2203	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: mvanderheyden@traceenviro.com	E-mail	: ALSEnviro.Sydney@ALSGlobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 19.13	Page	: 1 of 2
Order number	: ----	Quote number	: ES2018TRAENV0003 (EN/222 (Sydney Batches))
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Jack Ellis		

Dates

Date Samples Received	: 28-Aug-2019 17:30	Issue Date	: 06-Sep-2019
Client Requested Due Date	: 12-Sep-2019	Scheduled Reporting Date	: **12-Sep-2019**

Delivery Details

Mode of Delivery	: Samples On Hand	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 4.1
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **This is a rebatch of ES1927524.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	SOIL - EG005C Leachable Metals by ICPAES	SOIL - EN33a TCLP Leachate
ES1928640-001	27-Aug-2019 00:00	QS3A	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

ANDREW KITA

- A4 - AU Tax Invoice (INV)	Email	andrew@traceenviro.com

MATT VANDERHEYDEN

- *AU Certificate of Analysis - NATA (COA)	Email	mvanderheyden@traceenviro.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	mvanderheyden@traceenviro.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	mvanderheyden@traceenviro.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	mvanderheyden@traceenviro.com
- Chain of Custody (CoC) (COC)	Email	mvanderheyden@traceenviro.com
- EDI Format - XTab (XTAB)	Email	mvanderheyden@traceenviro.com

Vishal
05/09/2019
1440

Vishal Patel

From: Alice Carney
Sent: Thursday, 5 September 2019 2:38 PM
To: Vishal Patel
Subject: TCLP analysis request - ES1927524

Hey Vishal,

Could you please arrange this re-batch for me? The client would like sample #3 analysed for Ni on a TCLP.

Workorder # ES1927524

Standard TAT.

Environmental Division
Sydney
Work Order Reference
ES1928640

Telephone : +61-2-8784 8555

Best regards,

Alice Carney

Client Services Officer, Environmental
Sydney

T +61 2 8784 8555
D +61 2 8784 8504
F +61 2 8784 8500
Alice.carney@alsglobal.com
277-289 Woodpark Road
Smithfield NSW 2164 AUSTRALIA

See how ALS is making sampling easier! Register your interest here.

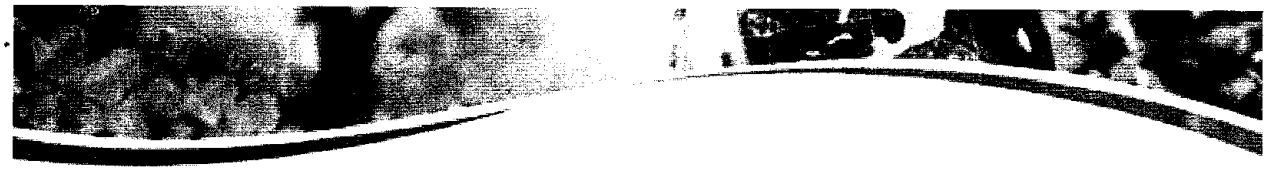
Right Solutions · Right Partner
www.alsglobal.com

From: Matt Vanderheyden [mailto:mvanderheyden@traceenviro.com]
Sent: Thursday, 5 September 2019 2:27 PM
To: ALSEnviro Sydney <ALSEnviro.Sydney@ALSGlobal.com>
Subject: [EXTERNAL] - TCLP analysis request - ES1927524

Good afternoon,

Could I please request TCLP analysis for Ni on sample QS3A from batch ES1927524?

Regards,



TRACE ENVIRONMENTAL

Matthew Vanderheyden
Senior Environmental Scientist

TRACE Environmental
02 8960 0555 0401 457 535
Shop 2, 793-799 New Canterbury Road
Dulwich Hill NSW 2203
www.traceenviro.com mvanderheyden@traceenviro.com

Appendix F

Field Documents

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13
Project Manager: Matt Vanderheyden
Location: Walter Street and Willoughby Road
Client: Walter Projects Pty Ltd

Borehole No: SB1/MW4
Date: 26/08/2019
Drilled by: Epoca Environmental

EXCAVATION DATA				MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	WELL CONSTRUCTION	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0					Concrete - 0.125m thick			
		0.2 QS1 QS1A		0.0		FILL: Clayey gravelly SAND, brown	M		No odour, no staining
		0.5		0.0		Clayey gravelly SAND, light brown	M		No odour, no staining
	1	1.0	Grout	0.0		Poor returns			
	2	2.0		0.0		Sandy CLAY, dark brown/grey	D		No odour, no staining
						Clayey SAND, light brown	D		Natural - No odour, no staining
	3	3.0		0.0					
	4	4.0		0.0		SANDSTONE, weathered	D		
							M		
	5	5.0		0.0					
	6								
	7						W		
	8								
	9								
						Borehole terminated at 9.3m - target depth attained			

NOTES:
Hand auger to 1.1m
Rotating auger to 5.0m
Air hammer to 9.3m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB2

Project Manager: Matt Vanderheyden **Date:** 26/08/2019

Location: Walter Street and Willoughby Road **Drilled by:** Epoca Environmental

Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1	0.0		FILL - Gravelly SAND, brown, trace sandstone fragments	D		No odour, no staining, brick and concrete fragments, roots
					Borehole terminated at 0.15m - refusal on sandstone bedrock			

NOTES:

Hand auger to 0.15m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB3

Project Manager: Matt Vanderheyden **Date:** 26/08/2019

Location: Walter Street and Willoughby Road **Drilled by:** Epoca Environmental

Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1	0.0		FILL - Gravelly SAND, brown, trace sandstone fragments	D		No odour, no staining, concrete fragments, roots
		0.2	0.0		Gravelly SAND, some clay, light brown, trace sandstone fragments	D		No odour, no staining
					Borehole terminated at 0.2m - refusal on sandstone bedrock			

NOTES:

Hand auger to 0.2m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB4
Project Manager: Matt Vanderheyden **Date:** 26/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** Epoca Environmental
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
	0.1	0.1	0.0		FILL - Gravelly SAND, brown, trace sandstone fragments	D		No odour, no staining, concrete fragments, roots
					Borehole terminated at 0.2m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.2m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB5
Project Manager: Matt Vanderheyden **Date:** 26/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** Epoca Environmental
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
	0.1	0.1	0.0		FILL - Clayey SAND, brown, trace sandstone fragments	H		No odour, no staining, roots
	0.5	0.5	0.0		Sandy CLAY, light brown/orange, some sandstone and ironstone	H-M		No odour, no staining
					Borehole terminated at 0.55m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.55m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB6
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
	0.1	0.1	0.0		FILL - Gravelly SAND, brown/grey	D		No odour, no staining, organics
					Borehole terminated at 0.2m - refusal			

NOTES:
Hand auger to 0.2m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB7
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
	0.1	0.1	0.0		FILL - TOPSOIL: Gravelly SAND, some clay, brown/grey	D		No odour, no staining
	0.25							
	0.5	0.5	0.0					
					Borehole terminated at 0.5m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.5m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB8
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1 QS2 QS2A	0.0		FILL - Gravelly SAND, brown/grey and some white, trace sandstone cobbles	D		No odour, no staining, brick fragments
	0.5	0.6	0.0		Becoming light brown			No odour, no staining
	1.0	1.0	0.0		CLAY, grey with some mottling	D		No odour, no staining
					Borehole terminated at 1.05m - required depth attained			

NOTES:
Hand auger to 1.05m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB9
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1	0.0		FILL - Gravelly SAND, some clay	H		No odour, no staining, brick fragments
	0.5	0.6	0.0		Sandy CLAY, light brown	H		No odour, no staining
					Borehole terminated at 0.7m - required depth attained			

NOTES:
Hand auger to 0.7m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB10
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1	0.0		FILL - Clayey gravelly SAND, brown	H		No odour, no staining, brick fragments
	0.25							
	0.5	0.5	0.0		CLAY, brown/orange mottling	D-H		No odour, no staining
					Borehole terminated at 0.5m - required depth attained			

NOTES:
Hand auger to 0.5m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB11
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Gravelly SAND, some clay, grey	H		
	0.25							
	0.5							
		0.6	0.0		Sandy CLAY, medium plasticity	H		
					Borehole terminated at 0.6m - required depth attained			

NOTES:
Hand auger to 0.6m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB12
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, some gravels and clay, dark brown	H		Brick fragments
		0.4	0.0			D		
					Borehole terminated at 0.4m - refusal			

NOTES:
Hand auger to 0.4m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB13
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.1	0.0		FILL - Sandy gravelly CLAY, dark grey	W		Organic material, organic odour
	0.5							
		0.6	0.0		Sandy CLAY, grey with orange mottling, some sandstone	W		
					Borehole terminated at 0.7m - required depth attained			

NOTES:
Hand auger to 0.7m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB14
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Sandy CLAY, some gravels, dark brown	H		
					Borehole terminated at 0.1m - refusal on red sandstone			

NOTES:
Hand auger to 0.1m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB15
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty CLAY, some sand, light brown	H		
	0.25							
		0.4	0.0		SAND, some clay, light brown	H		
	0.5							
					Borehole terminated at 0.6m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.6m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

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PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB16
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, medium grained, some gravels, dark brown/red	H		
		0.3	0.0		SAND, medium grained, light brown	H		
					Borehole terminated at 0.4m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.4m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB17
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Gravelly clayey SAND, medium grained	M		
					Borehole terminated at 0.2m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.2m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB18
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, fine to medium grained, dark brown/grey	D		
	0.25							
					SAND, trace silt, light brown	D		
	0.5	0.5	0.0					
	0.75							
	1.0	1.0	0.0		White sandstone fragments			
					Borehole terminated at 1.0m - required depth attained			

NOTES:
Hand auger to 1.0m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB19
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, trace clay, dark brown	H		Organic material
					Borehole terminated at 0.6m - refusal on sandstone bedrock			

NOTES:
Hand auger to 0.2m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

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Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB20
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, trace gravels	H		
					Borehole terminated at 0.25m - refusal on grey/brown sandstone bedrock			

NOTES:
Hand auger to 0.25m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

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PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB21
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.05 *	0.0		FILL - Sandy CLAY, trace silt and gravel, dark grey	W		No staining, no odour
		0.1	0.0		CLAY, moderate to high plasticity, grey mottled brown	H		No staining, no odour
					Borehole terminated at 0.2m - required depth attained			

NOTES:
Hand auger to 0.2m
* Duplicate/Triplicate samples QS3/QS3A associated with primary sample SB21_0.05

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB22
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.05	0.0		FILL - Silty SAND, some gravels, dark brown/black	M		
	0.25				Sandy CLAY, medium plasticity, grey with light brown mottle	M		
	0.5				Becoming light grey, friable sandstone			
		0.6	0.0		Borehole terminated at 0.6m - required depth attained			

NOTES:
Hand auger to 0.6m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB23
Project Manager: Matt Vanderheyden **Date:** 27/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Silty SAND, fine grained, brown	D		
	0.5	0.5	0.0		FILL(?) - Sandy CLAY, light brown mottled grey	D		
	0.8				Borehole terminated in natural clay at 0.8m			

NOTES:
Hand auger to 0.5m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

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PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB24
Project Manager: Matt Vanderheyden **Date:** 28/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0							
		0.1	0.0		FILL - Gravelly SAND, some clay, brown	H		No odour, no staining, brick fragments
	0.25							
	0.5	0.5	0.0		FILL - Clayey SAND, grey/brown	W		No odour, no staining
	0.75							
		0.8	0.0		CLAY, some sand, brown	H		No odour, no staining
					Borehole terminated at 0.8m - required depth attained			

NOTES:
Hand auger to 0.8m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE ENVIRONMENTAL

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB25
Project Manager: Matt Vanderheyden **Date:** 28/08/2019
Location: Walter Street and Willoughby Road **Drilled by:** JE
Client: Walter Projects Pty Ltd

EXCAVATION DATA					MATERIAL DATA			
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
		0.05	0.0		FILL - Sandy gravelly CLAY, blackSilty SAND, some gravels, dark brown/black	W		No odour, no staining, brick fragment, possible leaking pipe
	0.25							
	0.5				Sandy CLAY, grey/brown	W		No odour, no staining, possible leaking pipe
		0.6	0.0					
					Borehole terminated at 0.6m - required depth attained			

NOTES:
Hand auger to 0.6m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

BOREHOLE LOG

TRACE Environmental Pty Ltd
PO Box 422
Camperdown NSW 1450

Project No: 19.13 **Borehole No:** SB26

Project Manager: Matt Vanderheyden **Date:** 28/08/2019

Location: Walter Street and Willoughby Road **Drilled by:** JE

Client: Walter Projects Pty Ltd

EXCAVATION DATA			MATERIAL DATA					
WATER (Stabilised)	DEPTH (mm)	SAMPLE ID	PID (ppm)	GRAPHIC LOG	DESCRIPTION Soil division: sand / gravel / clay, grading, weathering, plasticity, colour, other.	MOISTURE	CONSISTENCY DENSITY INDEX	STRUCTURE AND ADDITIONAL OBSERVATIONS
	0				Grass			
	0.1	0.1	0.0		FILL - Gravelly SAND, black/brown	D		No odour, no staining
					Borehole terminated at 0.15m - refusal on sandstone bedrock			

NOTES:

Hand auger to 0.15m

Moisture
D: Dry H: Humid
M: Moist W: Wet

Consistency Index
VS: Very Soft S: Soft St: Stiff
V St: Very Stiff
F: Firm H: Hard Fb: Friable
MD: Medium Dense

Density Index
VL: Very Loose D: Dense
L: Loose VD: Very Dense

* Description based on Unified Soil Classification System
* Photo Ionisation Detector (PID)
* Parts per million (ppm)

Well Gauging Sheet - 1-31 Walter Street and 450-462 Willoughby Road, Willoughby NSW

Monitoring Well ID	Well Diameter (mm)	Date	Total Well Depth* (mBTOC)	Depth to Water (mBTOC)	Purged Volume (L)	Colour	Electrical Conductivity EC (µS/cm)	Total Dissolved Solids TDS (mg/L)	Dissolved Oxygen DO (ppm)	pH (pH unit)	Redox ORP (mV)	Comments
MW1	50	2/09/2019	6.69	2.369	2.5	Grey brown	195.5	131	2.16	6.80	172.3	No odour, no sheen, medium turbidity
MW2	50	2/09/2019	8.28	3.359	2.5	Clear	224.8	151	0.49	4.22	380.4	No odour, no sheen, low tubridity
MW3	50	2/09/2019	10.58	4.226	2.5	Clear	530	355	0.15	5.76	168.5	No odour, no sheen, low tubridity
MW4	50	2/09/2019	-	2.876	2.5	Clear	593	397	0.82	4.62	148.2	No odour, no sheen, low turbidity

Notes: "MW-##" Groundwater Monitoring Well
mBTOC - metres below top of casing
ORP - Oxidation Reduction Potential
WT - Water Table (metres relative to temporary benchmark)
HC - Hydrocarbon
* Total well depth gauged 22/08/19

QWI/QWIA

MONITORING WELL SAMPLING LOG - LOW-FLOW

TRACE ENVIRONMENTAL

Date: 2/9/19 **Project No:** 19.13

Site Address: WALTER ST, WILLOUGHBY

Start Time: 1008 **Finish Time:** 1024

Monitor Well No: MW1 **Sampling Method:** LF

Well Head Condition: Good **Recorded by:** AC

H = High M = Medium L = Low

X = Not present Y = Yes N = No

Note: Do not smell for HC odour, however, inadvertent observations should be noted.

All ACT sites must be tested for ethanol.

Field Observations

Well ID	Well Diameter (mm)	Depth to LNAPL (mbtoc)	Depth to Water (mbtoc)	LNAPL Thickness (m)	Total Well Depth (mbtoc)	Sample Filtered	HC Odour	Sheen	Turbidity	Physical Observations Colour, LNAPL colour, other odours, etc.
MW1	50	—	2.369	—	N/A	✓	—	—	~~Lo~~ Mod.	milky ~~white/light orange~~ brown grey brown

Field Parameter Measurements

Time	Volume Purged (L)	Temp (°C)	Electrical Cond (EC) (µS/cm)	Dissolved Oxygen (DO) (mg/L)	pH	Redox Potential (ORP) (mV)	Depth to Water (mbtoc)	Comments
1010	0.5	17.5	230.9	1.60	8.45	140.9	2.701	
1013	1.0	17.3	224.2	1.98	7.89	135.3	2.753	
1016	1.5	17.3	220.8	1.79	7.32	145.3	2.841	
1020	2.0	17.3	205.8	1.85	6.96	156.1	2.931	
1024	2.5	17.2	195.5	2.16	6.80	172.3	2.996	

MONITORING WELL SAMPLING LOG - LOW-FLOW

TRACE ENVIRONMENTAL

Date: 2/9/19 **Project No:** 19.13

Site Address: WALTER ST, WILLOUGHBY

Start Time: 1103 **Finish Time:**

Monitor Well No: MW2 **Sampling Method:** LF

Well Head Condition: Good **Recorded by:** AC

H = High M = Medium L = Low

X = Not present Y = Yes N = No

Note: Do not smell for HC odour, however, inadvertent observations should be noted.

All ACT sites must be tested for ethanol.

Field Observations

Well ID	Well Diameter (mm)	Depth to LNAPL (mbtoc)	Depth to Water (mbtoc)	LNAPL Thickness (m)	Total Well Depth (mbtoc)	Sample Filtered	HC Odour	Sheen	Turbidity	Physical Observations Colour, LNAPL colour, other odours, etc.
MW2	50	–	3.559	–	–	✓	–	–	Low	clear.

Field Parameter Measurements

Time	Volume Purged (L)	Temp (°C)	Electrical Cond (EC) (µS/cm)	Dissolved Oxygen (DO) (mg/L)	pH	Redox Potential (ORP) (mV)	Depth to Water (mbtoc)	Comments
1107	0.5	17.9	221.1	0.72	5.01	340.8	3.561	
1109	1.0	17.9	223.0	0.58	4.67	360.2	3.681	
1112	1.5	17.9	223.6	0.54	4.47	371.0	3.789	
1116	2.0	18.0	224.4	0.54	4.29	375.7	3.899	
1121	2.5	18.0	224.8	0.49	4.22	380.4	3.904	

MONITORING WELL SAMPLING LOG - LOW-FLOW

TRACE ENVIRONMENTAL

Date: 2/9/19 **Project No:** 19.13

Site Address: WALTER ST, WILLOUGHBY

Start Time: 1250 **Finish Time:**

Monitor Well No: MW3 **Sampling Method:** LF

Well Head Condition: Good **Recorded by:** AL

H = High M = Medium L = Low

X = Not present Y = Yes N = No

Note: Do not smell for HC odour, however, inadvertent observations should be noted.

All ACT sites must be tested for ethanol.

Field Observations

Well ID	Well Diameter (mm)	Depth to LNAPL (mbtoc)	Depth to Water (mbtoc)	LNAPL Thickness (m)	Total Well Depth (mbtoc)	Sample Filtered	HC Odour	Sheen	Turbidity	Physical Observations Colour, LNAPL colour, other odours, etc.
MW3	50	—	4.226	—	—	✓	—	—	LOW	CLEAR / SLIGHTLY MILKY

Field Parameter Measurements

Time	Volume Purged (L)	Temp (°C)	Electrical Cond (EC) (µS/cm)	Dissolved Oxygen (DO) (mg/L)	pH	Redox Potential (ORP) (mV)	Depth to Water (mbtoc)	Comments
1253	0.5	17.5	530	0.34	5.63	187.9	4.541	
1256	1.0	17.5	530	0.27	5.70	179.1	4.683	
1300	1.5	17.4	529	0.19	5.73	173.8	4.841	
1304	2.0	17.4	529	0.16	5.75	169.3	4.910	
1309	2.5	17.4	530	0.15	5.76	168.5	5.061	

MONITORING WELL SAMPLING LOG - LOW-FLOW

TRACE ENVIRONMENTAL

Date: 2/9/19 **Project No:** 19.13

Site Address: WALTER ST WILLOUGHBY

Start Time: 1149 **Finish Time:**

Monitor Well No: Good **Sampling Method:** LF

Well Head Condition: MW-~~3~~4 **Recorded by:** AC

H = High M = Medium L = Low

X = Not present Y = Yes N = No

Note: Do not smell for HC odour, however, inadvertent observations should be noted.

All ACT sites must be tested for ethanol.

Field Observations

Well ID	Well Diameter (mm)	Depth to LNAPL (mbtoc)	Depth to Water (mbtoc)	LNAPL Thickness (m)	Total Well Depth (mbtoc)	Sample Filtered	HC Odour	Sheen	Turbidity	Physical Observations Colour, LNAPL colour, other odours, etc.
MW4	50	—	2.876	—	——	✓	—	—	low	Clear

Field Parameter Measurements

Time	Volume Purged (L)	Temp (°C)	Electrical Cond (EC) (µS/cm)	Dissolved Oxygen (DO) (mg/L)	pH	Redox Potential (ORP) (mV)	Depth to Water (mbtoc)	Comments
1152	0.5	17.7	588	1.27	4.88	224.1	3.035	
1156	1.0	17.6	587	1.07	4.84	208.4	3.096	
1200	1.5	17.5	587	0.95	4.77	194.3	3.138	
1204	2.0	17.7	591	0.86	4.67	177.2	3.162	
1208	2.5	17.6	593	0.82	4.62	148.2	3.201	