Remedial Action Plan

170 Reservoir Road

Arndell Park, New South Wales

Paynter Dixon Constructions Pty Ltd

5 September 2019

TRACE Environmental
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Remedial Action Plan

170 Reservoir Road
Arndell Park, NSW

Prepared for:
Paynter Dixon Constructions Pty Ltd

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Table of Contents

Figures

Appendices

Executive Summary

TRACE Environmental was engaged by Paynter Dixon Constructions Pty Ltd (Paynter Dixon) to prepare a Remedial Action Plan (RAP) for the property located at 170 Reservoir Road, Arndell Park, NSW (the site). The site covers an area of approximately 5.5 Ha and is described part of Lot 201 DP880404. Based on development plans provided by Paynter Dixon, the site is proposed for redevelopment for medium to high-density residential land use, and will also include an aged care facility, communal/open space areas, and single-level basement car parking.

This RAP has been prepared by TRACE Environmental to document an appropriate and cost-effective remedial strategy and validation program to render the site suitable for the proposed medium to high-density residential and communal/open space land uses.

Environmental investigations undertaken at the site have identified asbestos impacted fill material across portions of the site. These require remediation and/or management to make the site suitable for the proposed medium to high-density residential, aged care and open space land uses. These impacts are considered to be associated with the site's historical import of fill material, and potential asbestos-containing building materials associated with demolition of historical site structures.

The proposed remediation strategy for the site comprises retaining of asbestos impacted materials on site (i.e. beneath basement hardstand within on-site building footprints and roads/hardstand areas). Should asbestos impacted material be contained on site, a long-term Environmental Management Plan (EMP) may be required.

The remediation strategy will be supervised by a suitably qualified and experienced environmental consultant and will include the following:

- Implementation of management practices during the remedial works to minimise the potential risks to on-site workers, vicinity third parties and the environment;
- Validation of material to be retained in deep soil zones (if any) on site to confirm that these exposed soil areas are suitable for the proposed land uses;
- Validation of soils to be retained on site following excavation of overlying fill material (if any) to confirm that these soil areas are suitable for the proposed land uses;
- In the event of the discovery of previously unidentified soil impacts (i.e. unexpected finds) during site redevelopment works, additional validation and/or remediation of the soil may be necessary. If required, the validation soil sample results will be compared to the guideline criteria applicable to the proposed land use within that stage;
- If significant unexpected soil impacts are encountered during soil remedial works, validation of the groundwater beneath the site may become necessary. However, based on the data collected to date, remediation of groundwater at the site is not considered to be necessary;
- In the event that imported fill material is needed to backfill any excavations (i.e., for service trenches), only material certified as comprising Virgin Excavated Natural Material (VENM) should be imported onto the site; and
- Following completion of the proposed remedial/management strategy, Validation Report/s will be prepared for the site.

It is noted that this RAP has been prepared based on current proposed development plans (provided in **Appendix A**). Should the design plans be modified to include more sensitive land uses than outlined in this

report (such as childcare centres, preschools), this RAP should be revised to include appropriate validation sampling requirements and criteria for these areas of the site.

It is considered that the site will be made suitable for the proposed medium to high-density residential and communal/recreational open space land uses following successful implementation of the above remediation/management strategy for the site. The Validation Report will detail the methods and results of the site remedial activities and demonstrate that the site was remediated to a condition suitable for the proposed land uses.

1 Introduction

TRACE Environmental was engaged by Paynter Dixon Constructions Pty Ltd (Paynter Dixon) to prepare a Remedial Action Plan (RAP) for the property located at 170 Reservoir Road, Arndell Park, NSW (the site). The site covers an area of approximately 5.5 Ha and is described part of Lot 201 DP880404. Based on development plans provided by Paynter Dixon, the site is proposed for redevelopment for medium to high-density residential land use and will also include an aged care facility and communal/open space areas.

A Locality Plan is presented in **Figure 1** and a Site Plan is presented in **Figure 2.** Development plans for the site provided by Paynter Dixon are presented in **Appendix A**.

A Detailed Site Investigation (DSI) was undertaken at the site by TRACE Environmental in 2018[1], which identified asbestos in fill material at concentrations exceeding high-density residential and/or recreational open space assessment criteria at seven locations across the site. Based on the findings of the DSI, TRACE Environmental recommended that a RAP be prepared for the management and/or remediation of the identified asbestos impacted fill material to render the site suitable for the proposed land uses. The DSI is further summarised in **Section 3** below.

This document has been prepared by TRACE Environmental to document an appropriate and cost-effective remedial strategy and validation program to render the site suitable for the proposed medium to high-density residential and communal/open space land uses.

This document has been prepared in accordance with guidelines made or endorsed by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997* (CLM Act), and in consideration of the principles of ecologically sustainable development (ESD) consistent with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.1 Details of Proposed Development

Based on development plans provided by Paynter Dixon (refer to **Appendix A**), the site is proposed for redevelopment for medium to high-density residential land use and will also include an aged care facility (south-eastern portion of the site), communal/open space areas, community facilities and associated internal road infrastructure. The redevelopment will also include a number of single-level basement car parks across the site.

It is understood that the site redevelopment is proposed to be undertaken in stages, and that the Development Application (DA) process for the works will include submission of an initial DA for the first stage of development, followed by submission of a DA for the subsequent development areas. This RAP has been prepared to address the remediation requirements for the entire site development. Additionally, it is understood that there is currently no statutory requirement for completion of a site audit by a NSW EPA accredited auditor.

Based on the indicative design plans, the site development will comprise a total of 17 buildings (six three-storied, six four storied, four five-storied and one seven-storied buildings), single-level basement carpark land uses beneath building footprints across the site, communal/open space areas and associated internal road infrastructure. The land uses within the development area include a community centre (two buildings in the central-northern portion of the site), residential apartments, an aged care facility (one building in the south-western portion of the site) and communal/open space areas.

[1] TRACE Environmental (2018) *Detailed Site Investigation, 170 Reservoir Road, Arndell Park, NSW,* Dated 10 December 2018.

The site is zoned within RE2 – Private Recreation, IN2 – Light Industrial, IN1 – General Industrial, W1 – Natural Waterway, SP2 – Infrastructure, as stated within the Blacktown Council Local Environmental Plan (LEP) 2015.

1.2 Objective

The objective of this RAP is to outline the preferred remedial strategy for the site, both in the extent of remediation works required and validation sampling to be undertaken, to address identified asbestos in soil impacts at the site, and to make these areas of the site suitable for the proposed land use (as shown on the plans included in **Appendix A**).

1.3 Scope of Works

The following scope of works were undertaken in order to meet the objective described above:

- Conducting a limited desktop study including available online database searches and review of historical information from the following sources:
  - Previous environmental investigations conducted at the site;
  - NSW EPA administered environment management and contaminated land registers; and
  - Geological, hydrogeological and hydrological information and identification of nearby sensitive receptors.
- Identify potential sources of contamination, assess surrounding sensitive land uses, evaluate the general condition of the site in relation to potential contamination and identify known or suspected areas of potential concern (if any);
- Update the conceptual site model (CSM) for the site, outlining potential contamination sources, and exposure pathways and receptors which may be impacted, and undertake a preliminary environmental risk assessment (**Section 5**);
- Undertake an evaluation of potential remedial strategies to address contamination impacts identified at the site, based on criteria such as feasibility, reliability, long term risk mitigation and cost, among others;
- Prepare a Validation Plan to address validation sampling requirements following the completion of the proposed remediation works, and to ensure that the residual soils at the site are suitable for the proposed land use;
- Establishment of site and environmental management strategies to minimise adverse effects to site workers, vicinity third parties and the local environment during the remediation works;
- Development of contingency plans including unexpected finds protocols; and
- Occupational health and safety planning.

1.4 Statutory and Regulatory Framework

The following NSW Acts are considered relevant to this assessment:

- Contaminated Land Management Act 1997;
- Dangerous Goods (Road and Rail Transport) Act 2008;
- Environmentally Hazardous Chemicals Act 1985;

- Environmental Planning and Assessment Act 1979;
- Local Government Act 1993;
- National Environment Protection Council (New South Wales) Act 1995;
- Protection of the Environment Administration Act 1991;
- Protection of the Environment Operations Act 1997;
- Waste Avoidance and Resource Recovery Act 2001; and
- Work Health and Safety Act 2011.

Field activities and reporting will be carried out in accordance with the following guidelines and regulations:

- NEPC (2013), National Environment Protection (*Assessment of Site Contamination*) Measure (NEPM). National Environment Protection Council (NEPC) 1999, Amendment 2013;
- National Health and Medical Research Council (2018) *Australian Drinking Water Guidelines* (ADWG), Updated August 2018;
- 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;
- NSW Department of Urban Affairs and Planning (1998), *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land,* 1998;
- NSW EPA (1995), *Contaminated Sites Sampling Design Guidelines*. NSW EPA, September 1995*;*
- NSW EPA (2012), *Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases,* NSW EPA, November 2012;
- NSW EPA (2014), *Waste Classification Guidelines. Part 1: Classifying Waste*. NSW EPA, November 2014;
- NSW EPA (2015), *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act*. NSW EPA, September 2015;
- NSW EPA (2017), *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3rd Edition).* NSW EPA, 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 (2005), Australian Standard AS 4482.1-2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*. Standards Australia, Homebush, NSW;
- Standards Australia (1999), Australian Standard AS 4482.2-1999 - *Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia, Homebush, NSW;
- NSW Work Health and Safety Regulation 2017;
- SafeWork NSW *Code of Practice: How to Manage and Control Asbestos in the Workplace* (2016); and

- SafeWork NSW *Code of Practice: How to Safely Remove Asbestos* (2016).

2 Site Description and Setting

2.1 Site Identification

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

Table 2-1: Summary of Site Identification Details

ID Element	Description
Site Address	170 Reservoir Road, Arndell Park, NSW
Lot/DP (entire VRS site)	Part Lot 201 DP880404
Site Owners	Blacktown Workers Club
Local Council	Blacktown City Council
Site Coordinates (GDA 94 MGA 56)	-33.795621o and 150.895315o (approximate centre of site)
Approximate Site Elevation	59 – 64 m AHD
Site Area (approx.)	5.5 Ha
Zoning	RE2 – Private Recreation, IN2 – Light Industrial, IN1 – General Industrial, W1 – Natural Waterway and SP2 – Infrastructure

2.2 Site Description

A site inspection was completed by TRACE Environmental during fieldworks undertaken as part of the DSI in 2018. Details of the site, as observed during the inspection, are outlined in **Table 2-2** below.

Table 2-2: Site Description

Category	Observation
Current Use and Users/Occupiers	The site currently comprises two grassed playing fields. Current site users are employees of Blacktown Workers Club (e.g. landscaper/gardener/etc.), third parties and visitors that will utilise the playing fields. Intrusive maintenance workers may also be expected to undertake works periodically at the site.
Future Use and Users/Occupiers	The proposed future site land use will comprise medium to high-density residential land use and will also include an aged care facility, community facilities, communal/open space areas and associated internal road infrastructure. The redevelopment will also include a number of single-level basement car parks across the site. The future users of the site will be construction workers completing the development, residents who will occupy the apartments and aged care facility, and users of the communal/open space and community facilities. Intrusive maintenance workers would also be expected to undertake works periodically at the site.
Current Zoning and Permitted Uses	According to the Blacktown Council LEP 2015, the site is zoned as RE2 – Private Recreation, IN2 – Light Industrial, IN1 – General Industrial, W1 – Natural Waterway, SP2 – Infrastructure
Site features	The site currently comprises two grassed playing fields, with the upper (eastern) playing field being at an elevation approximately 1.5 m higher than the lower (western) field. A small structure, understood to be a canteen facility, is also located in the north-east of the site.
Chemicals, raw materials and intermediate products storage and use	No significant quantities of chemicals, raw materials or intermediate products were being used or stored in areas on site at the time of the January 2018 site inspection. There were no apparent underground storage tanks (USTs) or above ground storage tanks (ASTs) observed at the site.
Waste Management	No hazardous waste is currently, or is expected to be, generated and/or stored on site. Typical construction waste is likely to be generated and temporarily stored on site during construction activities. Once the development is complete, typical residential waste is expected to be temporarily stored on site before being transported off-site for disposal.
Reported spills, chemical losses, discharges to	No reported spills, chemical losses, discharges to land/water and/or incidents/accidents are known to have occurred on the site. No visual or olfactory evidence of chemically impacted surface soils were identified during field activities undertaken by TRACE Environmental. A

Category	Observation
land/water and/or incidents/accidents	review of available EPA databases on 23 November 2018 indicates the site has not been listed by the NSW EPA
Surface covering/ Vegetation	At the time of the site inspection, the site comprised a predominantly grassed surface, with a pavement at the central northern site area.
Topography and infilling	The site is generally flat, with the exception of grading in the centre of the two fields which slopes toward the west, and a steep batter along the western site boundary. EIS (2015) states that the playing fields have been formed by cut and fill, however prior import of fill from an unknown source may have historically been undertaken.
Surface drainage	Surface water currently drains across the site surface into a municipal storm water conveyance system. A local water drainage system is also located at the base of the central graded area, between the upper and lower playing fields. Following site redevelopment, surface water is expected to drain from the roof and via gutters and pipes to a municipal storm water conveyance system.

2.3 Surrounding Land Use

The site is located within a predominantly commercial/industrial and residential area. The surrounding land uses comprise the following:

- The current adjoining properties of the site comprise:
- North: Blacktown Workers Club;
- South: Penny Place with commercial/industrial uses beyond;
- East: Reservoir Road with low-density residential uses beyond; and
- West: Commercial/industrial uses.

2.4 Geology

Review of the Penrith *Geological Series Sheet 9030 (Edition 1)* (1991) indicates that the site is underlain by the Middle Triassic aged Bringelly Shale of the Wianamatta Group, comprising shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff.

The soil profile encountered during the DSI (TRACE Environmental 2018) following drilling of boreholes and excavation of test pits at the site is summarised below:

- Topsoil fill to between 0.05 and 0.4 mbgs; overlying
- Fill material comprising varying combinations of clay, silt, sand and gravel to between 0.1 and 3.2 mbgs; overlying
- Natural clay/silty clay, typically containing ironstone and/or shale gravels; overlying
- Weathered shale, pale brown to dark brown and grey to dark grey.

No staining or odours were observed during borehole drilling or test pit excavation. Field measured PID readings ranged between 0.0 and 3.8 ppm, indicating a low likelihood for the presence of volatile organic compounds (VOCs) in the soil samples collected at the site.

2.5 Hydrogeology / Hydrology

The nearest surface water body to the site is Bungarribee Creek located approximately 150 m west of the site. Based on the measured depth to groundwater and monitoring well survey data obtained by TRACE Environmental (2018), the calculated groundwater flow direction was to the west-northwest. Further details of the hydrogeology of the site is within **Table 2-3** below.

Table 2-3: Site Hydrogeology

Component	Description
Depth to Groundwater	Gauged between 3.055 mbtoc (MW3) and 3.962 mbtoc (MW2)
Non-aqueous phase liquid (NAPL)	No measurable NAPL was detected at the site
Inferred Flow Direction	Based on the measured depth to groundwater and monitoring well survey data, the inferred groundwater flow direction is to the west-northwest.
Water Bearing Unit	Shale/silty clay
Lateral Hydraulic Gradient	0.013 m/m
Hydraulic Conductivity	Approximately 2.3 x 10-6 m/s based on rising head test data
Effective Porosity	Estimated 0.1 (weathered shale)
Estimated Groundwater Velocity	Approximately 1.2 x 10-7 m/s
Total Dissolved Solids	Between approximately 5,467 mg/L (MW2) and 15,202 mg/L (MW1)
Potential Groundwater Discharge Zones	Bungarribee Creek located approximately 150 m west of the site

A search of the NSW Department of Primary Industries Office of Water/Water Administration Ministerial Corporation database was conducted on 31 January 2018 and identified three registered groundwater bores within 500 m of the site. The bores are registered for monitoring purposes and are located on the 7-Eleven service station located south-east of the site, beyond Penny Place.

2.6 Acid Sulfate Soils

A review of the maps provided online by the Australian Soil Resource Information System (ASRIS) (http://www.asris.csiro.au/) shows the site to have an extremely low probability for occurrence for Acid Sulfate Soils (ASS).

3 Previous Environmental Investigations

Previous environmental investigations conducted at the site include the following;

- Environmental Investigation Service (EIS) (2015), *Report to Blacktown Workers Sports Club C/- Paynter Dixon Constructions Pty Ltd on Stage 1 Environmental Site Assessment for Site A: Proposed Out Door Sports Facilities – 221 Walters Road, Arndell Park. Site B: Residential Age Care Facility and Childcare Centre – 170 Reservoir Road, Arndell Park, at Blacktown Workers Sports Club, Off Reservoir Road, Arndell Park, NSW,* Dated 19 February 2015; and
- TRACE Environmental (2018), *Detailed Site Investigation, 170 Reservoir Road, Arndell Park, NSW,* Dated 15 February 2018.

EIS (2015) Stage 1 Environmental Site Assessment

A Stage 1 Environmental Site Assessment (ESA) was completed for the site by EIS in 2015 to assess the potential for site contamination, assess associated risks posed to site receptors (if any), and to provide comment on the suitability of the site for the proposed high-density residential redevelopment. It is noted that the EIS investigation also included the assessment of areas outside the current site boundary, however the summary and conclusions of the EIS report below pertain to the findings of the investigation works conducted within the current site boundary only. The current site area is referred to by EIS (2015) as 'Site B'.

A review of historical documents indicated that the site appeared to have been used for historical agricultural/farming land uses. A small creek/gully historically ran through the approximate centre and northern half of the site, with the site apparently developed to the current layout sometime between 1970 and 1982. Based on the historical farming/agricultural land uses at the site, the potential risk of site contamination included potential herbicide use, historical import of fill material, and potential hazardous building materials associated with demolition of site structures.

Limited intrusive sampling was conducted by EIS across the site which comprised eight boreholes (212 to 219) and three test pits (220, 228 and 229). Subsurface conditions encountered during borehole drilling and excavation works generally comprised silty sand/silty clay fill material with some ash material (up to 3 m below ground surface (bgs)), overlying natural silty clay, overlying shale or sandstone. Soil samples collected from the boreholes and test pits across the site were analysed for contaminants of potential concern (COPCs) including heavy metals (arsenic, cadmium, chromium, copper lead, mercury, nickel and zinc), total recoverable hydrocarbons (TRH)/total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylenes & naphthalene (BTEXN), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphorous pesticides (OPPs), polychlorinated biphenyls (PCBs) and/or asbestos. Laboratory results for the analysed COPCs did not exceed the adopted human health or ecological criteria for high-density residential land use.

Based on the results of the Stage 1 ESA, EIS considered that the site can be made suitable for the proposed development subject to the following:

- Completion of a Preliminary Stage 2 ESA to address data gaps identified during the Stage 1 ESA at the site, including:
  - Assessment of areas of the site not investigated;
  - Assessment of groundwater conditions at the site; and
  - Additional waste classification for off-site disposal of fill material.

- Preparation of a salinity management plan for the proposed development; and
- Preparation of a RAP for the proposed development (including an unexpected-finds protocol (UFP)).

The borehole and test pit logs, figures and tables associated with the current site area investigated by EIS (2015) are included in **Appendix B**.

TRACE Environmental (2018) DSI

Following the initial Stage 1 ESA conducted by EIS in 2015, a DSI was conducted by TRACE Environmental in 2018 to assess the contamination status of soil and groundwater at the site in the context of the proposed high-density residential redevelopment, which included:

- Collection of 175 primary fill and natural soil samples from 30 boreholes and 20 test pits advanced across the site. It was noted that fill material was encountered across the site to depths of up to 3.2 mbgs. A total of 124 selected soil samples were analysed for a variety of COPCs to determine if historical site uses and/or potential import of fill material had impacted the subsurface at the site.
- Three of the soil bores were completed as permanent groundwater monitoring wells and were developed, gauged, purged and sampled. Groundwater was encountered in shale/silty clay at depths between approximately 6.5 and 10.0 mbgs at the site. Groundwater flow was inferred toward the north-northwest;
- The soil assessment did not identify COPCs at levels exceeding human health or ecological assessment criteria for the proposed high-density residential land use, with the exception of six locations in the upper (i.e. eastern) playing field and one location at the northern boundary of the lower (i.e. western) playing field, which reported asbestos in fill material above the human health criteria for high-density residential and public open space land uses; and
- Low levels of zinc reported in groundwater beneath the site exceeded adopted ecological assessment criteria, however were likely associated with an off-site source and were not considered to present a risk to future high-density residential site users. Therefore, further investigation of zinc in groundwater at the site was not considered to be required.

Based on the findings of the DSI, it was considered that the site can be made suitable for the proposed high-density residential land use following implementation of a RAP for management and/or remediation of asbestos impacted fill material at the site. Furthermore, prior to any disturbance of the subsurface being undertaken at the site as part of the proposed site redevelopment, TRACE Environmental (2018) also recommended that an Asbestos Management Plan (AMP) be prepared in accordance with SafeWork NSW Codes of Practice, which identifies the locations of the asbestos materials identified during the DSI and outlines how the asbestos risks will be controlled during work (including any air monitoring procedures that may be required).

The borehole and test pit logs, figures and tables associated with the DSI are included in **Appendix C**.

4 Summary of Data Gaps

4.1 Summary of Known Contamination and Data Gaps

As referenced in the TRACE Environmental DSI (2018), remediation of fill material containing asbestos at concentrations exceeding human-health criteria for high-density residential and recreational open space land uses is required before the site can be made suitable for the proposed land use. These exceedances were reported in soil samples BH4-1.0, BH9-2.6, BH23-2.3, TP2-0.4, TP4-0.3, TP5-0.2 and TP6-1.0 (refer to **Figure 3** and **Appendix C** for a full summary of the TRACE Environmental DSI results).

As summarised in the TRACE Environmental DSI (2018), the total number of investigation locations assessed at the site during the EIS (2015) and TRACE Environmental (2018) assessments (i.e. 61 locations) is considered sufficient to assess the subsurface conditions of material at the site. Additionally, the COPCs analysed during the EIS (2015) and TRACE Environmental (2018) investigations are considered adequate to assess the potential for contamination to be present on site based on the former and current site uses. Therefore, it is considered that the data obtained for the site is sufficient to inform the remediation requirements to make the site suitable for the proposed land use. It is also noted that this RAP incorporates an unexpected finds protocol (refer to **Section 7.2**) in the event that previously unidentified soil impacts are discovered during site redevelopment works.

4.2 Summary of Areas Requiring Remediation

Based on the review of historical data for the site in the context of the proposed site development, it is considered that asbestos impacted fill material in the vicinity of TRACE Environmental (2018) investigation locations BH4, BH9, BH23, TP2 and TP4 to TP6 require remediation to render the site suitable for the proposed site redevelopment. Therefore, the proposed strategy for remediation of asbestos impacted soil hot-spots outlined in this RAP has been prepared based on the human-health criteria exceedances identified at these locations on site.

The location of identified asbestos hot-spots requiring remediation at the site are shown in **Figure 3**.

5 Conceptual Site Model and Remedial Strategy Overview

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 5-1**, below. Additional details are included in the sections that follow as necessary.

Table 5-1: Preliminary Conceptual Site Model

Conceptual Site Model Element	Description
Site History/Contaminant Sources	Based on the findings of the Stage 1 ESA completed by EIS (2015), the site appears to have been used for historical agricultural/farming land uses. A small creek/gully historically ran through the approximate centre and northern half of the site and appears to have been infilled. Based on the results of the TRACE Environmental 2018 DSI, asbestos was identified in fill material at concentrations exceeding the adopted human health assessment criteria at six locations in the upper (i.e. eastern) playing field, and at one location at the northern boundary of the lower (i.e. western) playing field.
Site Current and Future Use	The site currently comprises two grassed playing fields and is proposed for redevelopment as medium to high-density residential land use and will also include an aged care facility, community facilities, communal/open space areas and associated internal road infrastructure. The redevelopment will also include a number of single level basement car parks across the site.
Site Geology	The soil profile encountered by TRACE Environmental during drilling of boreholes at the site comprised the following: • Topsoil fill to between 0.05 and 0.4 mbgs; overlying • Fill material comprising varying combinations of clay, silt, sand and gravel to between 0.1 and 3.2 mbgs; overlying • Natural clay/silty clay, typically containing ironstone and/or shale gravels; overlying • Weathered shale, pale brown to dark brown and grey to dark grey.

Conceptual Site Model Element	Description
Site Hydrogeology	During the groundwater investigation undertaken during the DSI, groundwater was gauged between 3.055 mbtoc (MW3) and 3.962 mbtoc (MW2) in the three monitoring wells at the site. Groundwater was encountered in weathered shale/silty clay at depths between 6.5 mbgs (MW2) and 10 mbgs (MW3) during well installation. Based on the gauging data obtained during the DSI, the inferred groundwater flow direction at the site is toward the west-northwest. Based on topography and the location of surrounding surface water bodies, groundwater beneath the site would be expected to flow toward Bungarribee Creek, located approximately 150 m west of the site.
COPCs – Soil	Based on the results reported in the DSI, no COPCs were detected at concentrations above applicable site assessment criteria for human health, with the exception of asbestos identified in fill material at select locations on site. No COPCs were detected at concentrations above applicable ecological assessment criteria in fill material at the site. No COPCs were detected at concentrations above the applicable human health or ecological site assessment criteria in natural soil samples collected at the site.
COPCs – Groundwater	With the exception of zinc reported above the NEPM (2013) Freshwater Groundwater Investigation Levels (GILs) in monitoring wells MW1 and MW2, no groundwater COPCs exceeded the site assessment criteria during the DSI (TRACE Environmental 2018). It is noted however that elevated levels of zinc were identified and were considered likely to be associated with an off-site source and were not considered to present a risk to future medium to high-density residential site users.
COPCs – Soil Vapour	While a vapour assessment has not been undertaken at the site, concentrations of analysed volatile compounds reported during the DSI were below the respective laboratory LORs in all soil and groundwater samples analysed at the site. Therefore, it is considered that a vapour intrusion (VI) risk is unlikely to be present to current and future site users.
Extent of Impacts – Soil	Based on the laboratory analytical results for soil samples collected at the site by EIS (2015) and TRACE Environmental (2018), fill material does not appear to be impacted by the COPCs at levels exceeding human health assessment criteria for the proposed site redevelopment, with the exception of asbestos identified in fill material in the vicinity of TRACE Environmental (2018) DSI locations BH4, BH9, BH23, TP2 and TP4 to TP6 (refer to **Figure 3**). Based on the laboratory analytical results for soil samples collected at the site by EIS (2015) and TRACE Environmental (2018), natural material does not appear to be impacted by the COPCs at levels exceeding human health or ecological criteria for the proposed medium to high-density residential and aged-care land use.
Extent of Impacts - Groundwater	With the exception of zinc reported above the NEPM (2013) Freshwater GILs in monitoring wells MW1 and MW2 during the DSI (TRACE Environmental 2018), no groundwater COPCs exceeded the site assessment criteria. Given the inferred groundwater flow direction (i.e. north-northwest), the identified zinc exceedance of NEPM (2013) Freshwater GILs in MW1 and MW2 has not been delineated off site in this direction. However, the elevated levels of zinc were reported to likely be associated with an off-site source and are not considered to present a risk to future site users.
Extent of Impacts – Soil Vapour	Given the general absence of volatile contaminants, it is unlikely that soil vapour beneath the site poses a potential VI risk to current and future site users.
Potential Human Receptors	Future users of the site will be construction workers completing the development, residents who will occupy the apartments, and users of the aged care facility, communal/open space and community facilities. Intrusive maintenance workers would also be expected to undertake works periodically at the site.

Conceptual Site Model Element	Description
Potential Environmental Receptors	With the exception of the planted trees at the site and central playing field boundaries, there are currently no sensitive ecological receptors on site and none in close proximity to the site. It is considered unlikely that the proposed medium to high-density redevelopment will comprise sensitive ecological receptors, however some garden/landscaped areas are to be constructed as part the site redevelopment. The nearest surface water body to the site is Bungarribee Creek, located approximately 150 m west of the site. Given the distance, this surface water body is considered a potential ecological receptor.

5.1 Preliminary CSM Summary and Risk Assessment

Based on the Stage 1 ESA completed by EIS (2015), the site appears to have been used for historical agricultural/farming land uses. A small creek/gully historically ran through the approximate centre and northern half of the site, with the site apparently developed to the current layout sometime between 1970 and 1982.

Based on the results of the DSI conducted at the site (TRACE Environmental 2018), asbestos is present in fill material at concentrations exceeding human health criteria for the proposed medium to high-density residential, aged care facility and/or communal/open space land uses at six locations in the upper (i.e. eastern) playing field, and at one location at the northern boundary of the lower (i.e. western) playing field (refer to **Figure 3**). The reported concentrations of asbestos may present a health risk to future site users associated with the future medium to high-density residential, aged care and communal/open space land uses in the vicinity of these locations, and the asbestos impacted fill material is considered unsuitable to remain on site without implementation of appropriate management procedures and/or remediation.

Based on the findings of the DSI (TRACE Environmental 2018) and Stage 1 ESA undertaken by EIS (2015), soil asbestos impacts exceeding human health criteria appear to be vertically delineated to fill material in the vicinity of investigation locations BH4, BH9, BH23, TP2 and TP4 to TP6 (refer to **Figure 3**), and are considered to be laterally delineated by surrounding investigation locations at the site.

Fill material does not appear to be impacted by the remaining COPCs at levels exceeding human health or ecological assessment criteria for the proposed medium to high-density residential, aged care and communal/open space land uses.

COPCs were not detected at concentrations above the applicable human health or ecological site assessment criteria in natural soil samples collected at the site.

Groundwater beneath the site was measured to be generally free of measurable COPC concentrations, with the exception of low concentrations of zinc reported in samples collected from monitoring wells MW1 and MW2 which was reported above the NEPM (2013) GIL for Freshwater. Given that the reported exceedance of groundwater criteria for zinc was reported in both upgradient (MW1) and downgradient (MW2) monitoring wells at the site, it is considered that the source of zinc in groundwater at the site is likely to be from off-site

The reported concentrations of zinc in groundwater samples collected at monitoring wells MW1 and MW2 does not appear to pose a health risk to future residential site users (based on assumed absence of groundwater extraction bores from the future site development) and current site users (based on the absence of beneficial reuse groundwater extraction bores on site, and in the vicinity of the site).

5.2 Remedial Strategy Overview

In consideration of the current CSM, and the requirement to provide an appropriate remedial/management strategy to render the site suitable for the proposed development, TRACE Environmental considers remediation of the site is necessary, which would adopt appropriate validation sampling frequencies following remediation to ensure that the site will suitable for the proposed land-use (refer to **Section 8** below).

6 Data Quality

6.1 Data Quality Objectives for Remediation and Validation

NSW EPA under s105 of the *Contaminated Land Management Act 1997* requires that DQOs are 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 site remediation, as detailed within NSW EPA (2017), are summarised below in **Table 6-1**.

Table 6-1: Data Quality Objectives for Remediation

DQO	Description
Step 1 State the Problem	Based on the results of the DSI conducted at the site (TRACE Environmental 2018), asbestos was identified in fill material at concentrations exceeding human health criteria for high-density residential and public open space land uses at six locations in the upper (i.e. eastern) playing field, and at one location at the northern boundary of the lower (i.e. western) playing field (refer to **Figure 3**).
Step 2 Identify the Decisions	The decisions that must be made are: • What is the extent of the soil impacts identified during the previous investigations conducted at the site? • Is the site soil suitable for the intended land use from a land contamination perspective? • What remedial/management strategy is required to address soil impacts that are not suitable for the intended land uses? • What is the potential current and future (i.e., building occupants) risk posed to potential on-site (and off-site) receptors from the soil impacts identified at the site? • What is the waste classification (per NSW EPA (2014) *Waste Classification Guidelines*) of any materials that are deemed unsuitable to remain on-site?
Step 3 Identify Inputs to the Decision	The primary inputs to the decisions described above are: • Soil validation samples collected from locations across the site, ensuring a sufficient number of samples are collected, in accordance with regulatory guidelines, to validate the previously identified impacts; • Collection of additional soil characterisation samples as necessary to classify materials not suitable to remain on-site for waste classification purposes (per NSW EPA (2014) *Waste Classification Guidelines*); • If soil aesthetic issues (including asbestos containing material (ACM)) are observed during the investigation/remedial works, soil samples will also be collected to characterise the observed impacts; • Laboratory analysis of soil samples (and/or groundwater/soil vapour samples, if necessary) for relevant COPCs, based on historical land use and environmental assessments conducted at the site; • Assessment of the analytical results against applicable guideline criteria, based on the current and future anticipated land uses; • Assessment of the suitability of the analytical data obtained against the DQIs; and • Aesthetic observations of soils, including odours, staining and waste inclusions during additional site remedial works.
Step 4 Define the Study Boundaries	The site is located at 170 Reservoir Road, Arndell Park, NSW, and for the purposed of this RAP, the lateral extent of the study comprises the entire site as shown on **Figure 2**. The vertical extent of the study will extend to the depth of the basement car park excavations at the site, which is anticipated to be approximately 3.5m below the current ground surface.

DQO	Description
Step 5 Develop a Decision Rule	The decision rules for the validation at the site include: • The number of soil validation sampling locations will be adequate to validate the soil (both laterally and vertically) following remediation/hotspot removal, and the number of soil validation sampling locations at the site will be adequate to validate residual soil in any 'deep soil zones' for deep planting zones (both laterally and vertically); • The number of soil stockpile characterisation samples will be adequate to classify materials for off-site disposal (as necessary); • If soil aesthetic issues (including ACM) are observed during the investigation, soil samples will be collected to characterise the observed impacts. Any soil aesthetic issues will be evaluated including areas of discolouration, odour and hazardous waste inclusions; • Primary, duplicate and triplicate soil samples will be analysed at NATA accredited laboratories; • Field and laboratory QA/QC results will indicate reliability and representativeness of the data set; • Laboratory LORs will be below the applicable guideline criteria for the analysed COPCs, where possible; • Applicable guideline criteria will be sourced from NEPM (2013) guidelines and other NSW EPA endorsed guidelines (as necessary); • If COPCs exceed the applicable guideline criteria in any collected soil samples, the site will be deemed to potentially contain 'hot spots' of contamination. If the concentration of a soil COPCs in a sample is below the applicable guideline criteria, then no further assessment/ remediation will be required with respect to that COPC; • 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 COPC in a sample exceeds the applicable guideline criteria, additional works (e.g. additional remediation or quantitative risk assessment) may be required to minimise the risk.
Step 6 Specify Limits on Decision Errors	To ensure the results obtained are reproducible and accurate, a QA/QC plan is incorporated into the sampling and analytical program. DQIs are used to assess the reliability of field procedures and analytical results. In particular, the DQIs within NSW EPA (2017) are used to document and quantify compliance. DQIs are described as follows, and are presented in **Table 6-2**, below: • Completeness – A measure of the amount of useable data (expressed as %) from a data collection activity; • Comparability – The confidence (expressed qualitatively) that data may be considered to 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 value. 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.

DQO	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: • Soil validation samples will be collected following remediation of asbestos hotspots within the fill material at frequencies outlined below in **Section 8.5**. Additional validation sampling will also be collected in any 'deep soil zones' (i.e. outside of building perimeters) to validate any residual fill material at these areas as suitable for the proposed land uses per procedures and frequencies outlined below in **Section 8.5**; • COPCs will be selected based on a review of historic activities at the site, and the results of the previous environmental assessments. COPCs are currently considered to comprise asbestos impacted fill material at select locations on site (refer to **Section 8.6.1** below for additional detail); • Samples will be collected by suitably qualified and experienced environmental consultants/scientists/engineers; • Soil samples will be collected and preserved in accordance with relevant standards/ guidelines; • NATA accredited laboratories will be engaged for all laboratory analyses; • Soil observations including odours, staining and PID readings will assist with selection of soil samples (if required) for laboratory analysis; and • Field and laboratory QA/QC procedures will be adopted and reviewed to indicate the reliability of the results obtained.

6.2 Data Quality Indicators

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

Table 6-2: 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 limits of reporting (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

Data Quality Indicator	Frequency	Data Acceptance Criteria
Samples homogenous	All samples	All Samples
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 Samples (if reusable sampling equipment is used)**	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.

**Trip blanks, trip spikes and rinsate samples will only collected if COPCs other than asbestos are analysed.

7 Remediation Acceptance Criteria

7.1 Soil Criteria

Previous investigations undertaken at the site (EIS 2015 and TRACE Environmental 2018) identified asbestos in fill material at concentrations that may present a risk to site users based on the proposed site redevelopment. Therefore, the remediation acceptance criteria for validation of asbestos in soil at the site are as follows:

- Asbestos:
  - NEPM (2013) HSLs for asbestos contamination in soil for residential with minimal opportunities for soil access (HSL B)[2] and open space/recreational areas (HSL C). This includes no visible asbestos for surface soil.

It is understood that the proposed development will also include garden areas or 'deep soil zones'[3]. Further sampling of exposed soil for asbestos/ACM is required in these areas to assess the suitability of this material to remain on-site. Further assessment of the proposed deep soil zones is outlined in **Section 8.5** and the results of soil samples collected from these areas will be compared to the asbestos criteria listed above.

The proposed remedial strategy (outlined below in **Section 8**) includes on-site re-use of site-sourced materials (as appropriate) at areas beneath basement hardstand within the on-site building footprints and beneath roads/hardstand areas. For on-site re-use material in these areas the following criteria will apply:

- Asbestos:
  - NEPM (2013) HSLs for asbestos contamination in soil for commercial/industrial land use (HSL D). This includes no visible asbestos for surface soil.

Additional considerations relating to validation of the site to the above criteria (including ecological considerations) are outlined below in **Section 8.5**.

7.2 Unexpected Finds

Should unexpected finds be identified during site remedial and/or redevelopment works (refer to **Section 9.5** below for more detail), soil samples collected from these areas will be assessed against the following criteria. The criteria adopted for a specific soil sample will be determined based on the surrounding site land use, and the COPCs that require assessment will be determined based on the nature of the find. However, the COPCs that may be encountered, and the applicable guideline criteria for each COPC, is outlined as follows:

- TRH and BTEXN:
  - NEPM (2013) Soil HSLs for VI for low to high density residential (HSL A/B), recreational open space (HSL C) and/or commercial/industrial (HSL D) land uses for sand, silt and clay;
  - CRC CARE (2011) Soil HSLs for VI for Intrusive Maintenance Worker (Shallow Trench). As a conservative measure, the sand HSLs have been adopted. This criteria is relevant for workers involved in shallow trenches to a maximum trench depth of 1m; and

[2] Includes the proposed aged care facility land use.

[3] The location of the garden areas and 'deep soil zones' are to be confirmed once details of the site development are finalised.

  - CRC CARE (2011) Soil HSLs for Direct Contact for Intrusive Maintenance Workers.

- 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/or commercial/industrial land uses (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/or commercial/industrial land uses (HSL D). This includes no visible asbestos for surface soil.

Ecological Screening Levels (ESLs) and Ecological Investigation Levels (EILs) outlined in Schedule B1 of NEPM (2013) will also be considered at the deep soil zone areas. It is noted that site-specific EILs for some metals have been calculated using parameters collected from natural soil samples across the site as outlined TRACE Environmental (2018).

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).

7.3 Waste Classification Samples

Fill and natural soil samples collected from the site for waste classification purposes are to be compared to the General Solid Waste (CT1) and Restricted Solid Waste (CT2) criteria presented in Table 1 of the NSW EPA (2014) *Waste Classification Guidelines: Part 1: Classifying Waste*, and leachable concentration (TCLP 1 & TCLP 2) and specific contaminant concentration (SCC1 & SCC2) criteria presented in Table 2 of NSW EPA (2014).

8 Remedial Action Plan

8.1 Remediation Objectives

The objective of the recommended remedial strategy is to address asbestos impacted fill material at the site that may be unsuitable to remain on site for the proposed medium to high-density residential, aged care and communal/open space land uses (refer to proposed development plans in **Attachment A**). Remedial and/or management works relating to the hotspots of asbestos impacted fill material are required to ensure that the site is suitable for the proposed land use. Based on the analytical data collected from the site by EIS (2015) and TRACE Environmental (2018), the following remediation objectives have been determined:

- Remediation of the identified hotspots of asbestos impacted fill material present on the site;
- Validation of material to be retained on site in deep soil zones (if any) or following excavation of overlying fill material (if any);
- Removal and validation of any additional materials that may be encountered during site development works deemed not suitable for the proposed development and/or materials excess to current site requirements;
- On-site containment of the asbestos impacted fill material and associated management; and
- Documentation of the validation process.

8.2 Soil Remedial Options Hierarchy

The *Guidelines for the NSW Auditor Scheme (3rd Edition)* (EPA 2017) outlines the preferred order of options for site remediation and management (noting this relates to soil impacts):

1. On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2. Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;
3. Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; and
4. Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

8.3 Remedial Options Evaluation

TRACE Environmental has evaluated potential remedial options listed in the hierarchy above to provide a recommended remedial strategy to address the asbestos impacted fill material at the site. The evaluation process is summarised in **Table 8-1**, below.

Table 8-1: Remedial Option Evaluation

DQO	Description
Option 1 On-site treatment of soil	This option includes on-site treatment of soil through land farming to stimulate biological degradation and volatilisation of COPCs. Periodic soil sampling is undertaken during the land farming process to determine if COPCs concentrations have been reduced to levels below the applicable guideline criteria. The COPC identified at the site is asbestos. Asbestos is not volatile or readily biodegradable and therefore cannot be reduced through on-site land farming in a reliable or timely manner. This option is eliminated as a potential remedial strategy.
Option 2 Off-site treatment of excavated soil	This option includes off-site treatment of soil through land farming to stimulate biological degradation and volatilisation of COPCs. Periodic soil sampling is undertaken during the land farming process to determine if COPCs concentrations have been reduced to levels below the applicable guideline criteria. This option is considered when there is not sufficient space on-site to remediate site soils. As described above, asbestos is not volatile or readily biodegradable and therefore cannot be reduced through off-site land farming in a reliable or timely manner. This option is eliminated as a potential remedial strategy.
Option 3 Excavation and off-site disposal of impacted soil	This option includes the excavation and transportation of soil to an off-site facility licensed to accept the waste. The volume of material is tracked through waste dockets and weight tickets at the receiving facility. This remedial strategy is appropriate to address the identified asbestos impacted fill material at the site in a timely manner, is reliable at removing asbestos from the site at concentrations above the applicable guideline criteria and can be completed in conjunction with the site redevelopment works. However, it is understood that Paynter Dixon has requested to limit the amount of off-site disposal of asbestos impacted fill material. This option is therefore not the preferred remedial strategy to address the asbestos impacted fill material at the site (but has been considered as a contingency).
Option 4 Consolidation and isolation of the soil on-site by containment	This option includes the encapsulation and/or capping of impacted soils with a properly designed cap, such as concrete. This remedial strategy relies on removing the completed receptor pathways to soil with the asbestos impacted fill material at concentrations above the applicable guideline criteria. The strategy is appropriate to address the asbestos impacts at the site in a timely manner, is reliable at reducing potential exposure to asbestos impacts at the site at concentrations above the applicable guideline criteria and can be completed in conjunction with the site redevelopment works. This strategy would necessitate leaving impacted soil at the site. It is noted that, should asbestos impacted material be retained on site, a long-term Environmental Management Plan (EMP) may be required. This option is the preferred remedial strategy to address the asbestos impacted fill material at the site. Additional information is provided below.

Based on the evaluation detailed above, encapsulation and/or capping of asbestos impacted fill material beneath basement hardstand within on-site building footprints and/or roads/hardstand areas is the preferred remedial strategy. This strategy will efficiently and reliably remove the completed receptor pathways to the asbestos impacted fill material at the site, minimise waste and render the site suitable for the proposed medium to high-density residential, aged care and communal/recreational open space land uses. It is noted that, should asbestos impacted material be retained on site, a long-term Environmental Management Plan (EMP) may be required depending on where the materials are placed.

It is proposed that remediation works generally follow the proposed staging of the site redevelopment. The asbestos impacted fill material within each stage will be excavated and stockpiled on site and each stage is to be 'cleared' and validated separately. The stockpiled asbestos impacted fill material will be buried on site and capped with concrete. The works are to be managed at each stage per requirements of **Section 9** below.

It is considered that this staging process is a suitable approach with respect to the amenity and wellbeing of adjoining residents and occupants of the site and adjoining land and will not adversely impact on the new

residents or commercial uses of the completed stage. This remedial strategy is further detailed in the following sections and outlined in the Asbestos Management Plan (AMP) for the site.

8.4 Management Strategy Details

Details of the excavation/on-site re-use strategy and the off-site disposal strategy (where appropriate), with details of any unexpected finds investigation (if required), the validation plan, further delineation within the deep soil zones, analytical requirements and QA/QC measures, are included in the following sections.

The number of soil validation sampling locations at the site will be adequate to validate the soil (both laterally and vertically) following remediation/hotspot removal.

8.4.1 Excavation Hotspots

For the purposes of this RAP, the excavation strategy for hotspots of at the site includes:

- Establish a remediation grid (10m intervals) across each stage and mark-out the hotspot areas previously identified during the recent DSI (TRACE Environmental 2018). The indicative boundaries and approximate area of each remediation hotspot area are shown on **Figure 4**. A remediation grid should be established in each development stage to facilitate remediation and validation of each hotspot and facilitate materials tracking. Validation of each of the hotspot grid areas will be conducted at a frequency outlined below in **Section 8.5**; and
- Tracking of the hotspot material excavated from each grid into temporary stockpiles, as well as stockpiling of excavated material for on-site re-use (such as on-site re-use beneath roads/hardstand areas) or for disposal (depending on the results).

The indicative boundaries and approximate area of each remediation hotspot area is shown on **Figure 4**.

Reference should be made to the borehole logs and laboratory results presented in the DSI (TRACE Environmental 2018 and **Appendix C**) when determining the required depth of remediation at the asbestos hotspot locations. The borehole logs and/or laboratory analytical data include the depth of the asbestos impacted material, the delineated depth and/or the depth to the fill/natural boundary layer. The final remediation depth will also be determined by the validation sampling following initial excavation of the asbestos hotspots on site.

Following removal and successful validation of the hotspots, the remaining fill/natural materials will be excavated progressively during the construction phase of the site (the soil validation sampling plan is detailed below in **Section 8.5**). Careful inspection of excavated materials will need to be conducted as per the unexpected finds protocol detailed in **Section 9.5** below.

Excess materials that cannot be incorporated into the development, including materials that are unsuitable for the proposed development (i.e. aesthetically unsuitable materials and/or exceedances of the remediation criteria outlined above in **Section 7**), and/or should unexpected finds be encountered that contain materials unsuitable for remaining on-site, these materials will be excavated with a mechanical excavator and may be temporarily stockpiled on site and appropriate sampling will be conducted for waste classification (as detailed below in **Section 8.4.2**). Ideally, the excavated soil will be loaded immediately into transport trucks or skip bins for disposal at the chosen facility. If stockpiled, the soil will be loaded onto trucks from the stockpile for transport and disposal at a facility licensed to accept the soil waste. Additional requirements for removal of asbestos impacted waste are detailed below in **Section 8.4**.

8.4.2 Soil Waste Classification

Additional sampling will be required for materials requiring removal from the site (such as materials surplus to the proposed development and for unexpected finds). Excess materials that will need to be classified separately will be sampled according to a proposed sampling density of 1 sample per 100m^3 for the waste classification assessment. Additional waste classification samples will be required to be analysed for the COPCs including BTEXN, TPH/TRH, PAHs, metals, phenols, OCPs, OPPs, PCBs and asbestos. Analysis for VOCs will be included if PID measurements indicate elevated readings, however, it is noted that VOCs have not been identified as a COPC at the site. Refer to **Section 8.5.3** below for additional detail of sampling of stockpiles.

8.4.3 Waste Tracking

Soil removed from the site will be tracked through weighbridge tickets and/or waste dockets provided by the receiving facility. The amount of material documented on the waste dockets will be compared to estimates of volume of material based on the excavation dimensions. This includes tracking of material excavated for off-site disposal, such as from unexpected finds or as required for site development (i.e., footing and/or trench excavations). If significant discrepancies are found between the waste dockets and volume estimates, then the discrepancy will be investigated by the appointed environmental consultant.

On-site soil movement shall be tracked by the appointed environmental consultant with information provided by the civil contractor, including the initial area/volume of any contaminated fill excavated, volumes transported off-site for disposal, locations of on-site stockpiles, locations of backfilled excavation and volume of fill imported for backfill purposes, if required. This includes tracking of material excavated from unexpected finds or material excavated as required for site development (i.e., footing and/or trench excavations). If significant discrepancies are found (such as between waste dockets and volume estimates for material disposed off-site, or between materials excavated from unexpected finds with VENM required to infill the finds), then the discrepancy will be investigated by the appointed environmental consultant.

Refer to **Section 8.12** below for information relating to waste classification and off-site disposal that is to be documented in the Validation Report and as required by the NSW EPA (2017) guidelines.

8.4.4 Liquid Waste

If significant volumes of water accumulate in the excavations during site remedial works, the water will be sampled to classify the liquid waste for off-site disposal, and subsequently disposed to stormwater or sewer, subject to water quality and receipt of appropriate approvals, or removed by a vacuum truck operated by a licensed liquid waste contractor and disposed at a NSW EPA licensed liquid waste treatment facility, where only small volumes of water require disposal.

8.5 Validation

The following sections provide the anticipated scope of soil sampling required for validating the site (including if unexpected finds are encountered, refer below for additional detail), as well as including waste classification of any surplus materials that cannot be incorporated into the proposed development.

Documentation of the required containment strategy, if undertaken, is also outlined below.

8.5.1 Soil Validation Sampling

Soil validation sampling will be conducted in accordance with the regulatory guidelines outlined above in **Section 1.4**.

A PID will be used for field screening on-site to evaluate the extent of potential VOC impact in excavations. Based on the results of the undertaken environmental investigations (including the recent TRACE Environmental 2018 DSI), significant concentrations of VOCs are not anticipated at the site, however, soil vapour sampling may be required if volatiles are encountered during investigation of unexpected finds. Should soil vapour sampling be required, this RAP should be updated.

Soils identified as being unsuitable for the proposed land use (i.e., exceedances of remediation criteria outlined above in **Section 7**) during this process should be excavated. Validation soil samples will be collected from the base and sidewalls of the resulting excavation and submitted for laboratory analysis for the COPCs as outlined below in **Section 8.6.1**. The analytical results will be compared to the guideline criteria outlined in **Section 7.1** to determine the suitability of the residual soils for the proposed land uses. The soil validation plan, including QA/QC sampling protocols, is presented in the following sections.

Asbestos 'Hotspot' Validation

As noted above in **Section 8.4.1**, remediation of asbestos impacted fill material at the site includes removal and validation of contamination hotspots that were identified during the recent TRACE Environmental DSI (2018) (**Figure 3**). The 'hotspots' should be assigned a remediation grid location (based on a 10m sampling grid) and soil validation samples will be collected from each 'hotspot' grid following excavation per the following ratios (which are based on frequencies outlined in WA DoH 2009 and per methodologies outlined below in **Table 8-2**):

- 1 per 5m length of strata of interest (or per 1m depth) of the resultant excavation wall; and
- Visual inspection and sample collection of the resultant excavation base at twice the minimum sampling frequencies for detecting circular hotspots by using a systematic sampling pattern as outlined in NSW EPA (1995), with a minimum of two samples per excavation.

The indicative boundaries and approximate area of each remediation hotspot area is shown on **Figure 4**.

Validation Sampling at Deep Soil Zones

During the previous DSI (TRACE Environmental 2018), sampling was conducted across the site in a systematic sampling pattern as outlined in NSW EPA (1995). However, if the site redevelopment will comprise deep soil zones, additional validation sampling for the presence of asbestos at these areas will be required to assess the suitability of soil within these areas to remain on site (if any). Given the identification of asbestos at the site during the DSI undertaken by TRACE Environmental (2018), validation sampling at these areas for asbestos analysis will be conducted at frequencies outlined in WA DoH (2009) (i.e. twice the minimum sampling frequencies for detecting circular hotspots by using a systematic sampling pattern as outlined in NSW EPA (1995)).

Validation Sampling Outside of the Identified Hotspots

Where fill material is excavated from outside the identified asbestos hotspots for on-site re-use or off-site disposal, validation sampling of residual fill and/or natural material will be undertaken to confirm that the remaining materials are suitable for the proposed land use and that no cross-contamination of these materials

has occurred during remediation works. Soil validation samples will be collected from these areas following excavation per the following ratios:

- 1 per 5m length of strata of interest (or per 1m depth) of the resultant excavation wall; and
- Visual inspection and sample collection of the resultant excavation base at twice the minimum sampling frequencies for detecting circular hotspots by using a systematic sampling pattern as outlined in NSW EPA (1995), with a minimum of two samples per excavation.

8.5.2 Additional Considerations

Additional considerations will be required during remedial works and validation sampling, as follows:

- Unexpected finds, if encountered, must also be investigated. Validation will be conducted per the frequency outlined above for asbestos hotspot validation where the unexpected find comprises asbestos. However, where sampling for additional COPCs is considered appropriate for the unexpected find, validation will be conducted per the following frequency:
  - 1 per 10m length of strata of interest (or per 1m depth) of the resultant excavation wall; and
  - 1 per 25m^2 of the resultant excavation base.
- Should the design plans be modified to include more sensitive land uses than outlined in this report (such as childcare centres, preschools), this RAP should be revised to include appropriate validation sampling requirements and criteria for these areas of the site;
- Consideration must be given to potential asbestos risks in existing fill materials, noting that asbestos impact has previously been encountered in fill materials at the site. As extensive investigations have been conducted across the site, areas of additional potential asbestos impacts (if encountered) will be considered as unexpected finds (per **Section 8.5**). These areas should be visually inspected for ACM on the ground surface on a grid-based inspection pattern comprising 1m transects with a 90^o direction change between each pass. If ACM is encountered that appears to be associated with a partially buried structure, or if evidence of extensive fill materials that contain ACM are observed, sub-surface sampling for asbestos analysis should be conducted at the density referenced above;
- Ecological considerations may be required should unexpected finds be identified at the site. Soil samples collected to assess unexpected finds will be compared to the applicable ecological criteria (EILs/ESLs referenced above in **Section 7**). As referenced in Schedule B1 of NEPM 2013, EILs apply principally to contaminants in the top 2m of the soil at the finished surface/ground level, and as such, considerations of soil variability within the upper 2m zone is required, such as if fill materials overly natural materials at these areas;
- Materials that are deemed unsuitable for re-use within residential or open space areas of the site but meet NEPM (2013) commercial/industrial criteria (per **Section 7** above) may be placed beneath the on-site paved roads, and ecological considerations will not be required at these locations. However, it is noted that the roads will need to be surveyed and be appropriately documented in the final Validation Report; and
- Fill material remaining on-site at the deep soil zones will be validated per the frequency outlined above in **Section 8.5**.

8.5.3 Excavated Stockpile Soil Sampling

Fill material excavated from asbestos impacted hot-spots and/or the general site area that is intended for on-site re-use should be stockpiled on site and sampled for suitability as re-use material. Soil samples will be collected from these stockpiles per the following ratios:

- Excavated asbestos hotspot material - visual inspection and sample collection at a rate of 1 per 25m^3 (per methodologies outlined below in **Table 8-2**); and
- General fill material - visual inspection for asbestos (i.e. inspection of 10L samples per methodologies outlined below in **Table 8-2**) at a rate of 2 per 70m^3 and sample collection at a rate of 1 per 70m^3.

Where fill material is removed and underlying natural soils are proposed for on-site re-use, these natural soils will be validated prior to excavation in accordance with the sampling requirements outlined in **Section 8.5.1**. In the event that natural soils are excavated and stockpiled prior to undertaking validation sampling, the stockpiled natural soils will be sampled at a rate of 14 per 1,000m^3.

Excess materials that cannot be incorporated into the site development will require classification in general accordance with NSW EPA (2014) *Waste Classification Guidelines* for off-site disposal. Excess materials to be disposed off site will be sampled at a density of 1 sample per 100m^3 as referenced above in **Section 8.4.2**) noting extensive sampling has been conducted across the site to date and the existing analytical data will also be used for waste classification (where appropriate). The additional samples will be analysed for selected COPCs including TRH/TPH, BTEXN, PAHs, eight heavy metals (arsenic, cadmium, copper, chromium, lead, mercury, nickel and zinc), phenols, PCBs, OCPs, OPPs, asbestos, electrical conductivity and/or pH. Additional characterisation for ASS may also be required depending on site observations (such as observations of sulfidic odours, iron staining), however it is not considered likely that ASS will be encountered at the site.

It is noted that stockpiles of excavated material will temporarily be placed at various locations during the remediation works. Validation of the excavated stockpile footprint is not required if stockpiles are placed on areas which will be subsequently remediated (i.e. if stockpiles are placed on previously identified fill materials, the bases of these stockpiles would not require additional validation).

If at any time during the remediation works stockpiles of fill material will be placed on material (fill or natural) that has already been validated, or on existing fill material that was not identified to contain a hotpot area; soil validation samples will be required from the stockpile footprint and analysed for the above selected COPCs. Samples will be collected at a frequency of 1 per 100m^2 of the resultant stockpile base.

Sediment/management controls as outlined below in **Section 9** will be required for stockpiled material at the site.

8.5.4 Soil Sampling Methodology

The sampling methodology adopted for collection of soil validation samples, is summarised in **Table 8-2** below:

Table 8-2: Soil Validation Sample Collection

Activities	Details
Validation Sampling	An excavator will be utilised to collect soil from the sidewalls and based of the resulting excavation. Validation soil samples of the soil materials will be manually collected by hand, protected by a dedicated nitrile glove, directly from the centre of the bucket of the excavator bucket used to excavate the site soils. The soil samples will be collected in 250mL jars supplied by the laboratory, labelled, and immediately stored on ice for transport to the laboratory. Samples collected for asbestos analysis will be collected in laboratory supplied 500mL plastic bags with a press ('Ziploc') seal in accordance with the NEPM (2013) requirements. Validation sampling of fill and/or natural materials (including where fill materials may remain at the site, including at any deep soil zones) will also include collection of 10L samples screened manually using a <7mm sieve or spread out for inspection on a contrasting colour fabric (per WA DoH). Natural materials requiring asbestos validation will require analysis of 500mL samples (plastic bags with a press seal) only.
Field Logging	Logging of the validation soil samples will be conducted in general accordance with the Unified Soil Classification System. Soil materials will be logged with the following information 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). Descriptions will be recorded on TRACE Environmental's standard field log sheets for uniformity in descriptions, presentation and to aid in future interpretations.
Validation Sampling Density	Validation soil samples for hot-spot validation, deep soil zones and stockpile sampling will be collected based on the densities described above in **Section 8.5**.
Field QC Samples	Field duplicates and triplicates of the validation soil samples will be prepared in the field by collecting split samples of the same material from the same depth. Samples will not be mixed or homogenised during collection or splitting. Samples for duplicate analyses will be selected from sampling locations characterised by indicators of contamination, odour and/or elevated PID responses (if encountered). A trip blank and a laboratory prepared trip spike will also accompany each batch of samples transferred to the laboratories for analysis if volatile COPCs are analysed (trip blanks or trip spikes will not be required if validation samples are analysed for only asbestos).
Sample Labelling, Storage and Transport	All samples will be 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 will be labelled in a manner that does not reveal to which primary sample the duplicate or triplicate belonged. All samples will be kept chilled in an ice filled esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures. By prior arrangement with the laboratories, samples will be analysed as soon as practicable after receipt.
Field Screening for VOCs	Additional soil from each validation sample location will be 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 will be assessed by a calibrated (100 ± 3 parts per million (ppm) isobutylene) PID with a lamp appropriate for detecting petroleum hydrocarbons to measure the presence of total VOCs.
Excavation Reinstatement	Any soil imported to the site will need to be validated as suitable for the proposed medium to high-density residential and/or public open space.
Decontamination	Reusable sampling equipment, if required during the remediation and validation works (such as a sampling trowel) will be decontaminated between each location by scrubbing in a solution of Decon 90, and a final rinse in potable water. A clean pair of disposable nitrile sampling gloves will be used between each validation sampling location. If reusable sampling equipment is used, rinsate blank samples will be collected during field decontamination procedures by rinsing decontaminated equipment with clean deionised water to enable the assessment of potential cross-contamination of the samples during the field handling. It is noted that rinsate sampling will not be required if samples for the submitted laboratory batch are only analysed for asbestos.

8.5.5 Imported Fill Sampling

If materials are required to be imported to site, they should comprise only Virgin Excavated Natural Material (VENM) (as defined in the POEO Act).

The Protection of the Environment Operations Act 1997 (POEO Act) defines VENM as:

- 'natural material (such as clay, gravel, sand, soil or rock fines):
  - (a) that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities; and
  - (b) that does not contain any sulfidic ores or soils or any other waste.
- and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved for the time being pursuant to an EPA Gazettal notice.'

Only material accompanied by a VENM certificate will be accepted. As such, any soil imported to the site for backfilling purposes should be sampled to determine its suitability for the proposed land uses. VENM sampling will comprise analysis at a NATA accredited laboratory for TPH/TRH, BTEXN, PAHs, phenols, 8 metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCP, OPPs, PCBs, electrical conductivity and asbestos. As part of the assessment process, if imported material is accompanied by a VENM certificate, one sample per 1,000m^3 should be collected. If imported material is not accompanied by a VENM certificate, a more robust sampling program and source site history review will need to be undertaken, including at least one sample per 250m^3 should be collected.

Laboratory analytical results will be compared to laboratory LORs for all organic analyses (TPH/TRH, BTEXN, PAHs, phenols, OCP, OPPs and PCBs) and asbestos, and to published background levels for inorganic analyses (metals).

8.5.6 Groundwater Monitoring

Previous groundwater analytical results (TRACE Environmental 2018) indicate that groundwater beneath the site is not impacted with COPCs at concentrations above the applicable guideline criteria, with the exception of zinc, which were attributed to an off-site source and are not considered to present a risk to future site users (based on assumed absence of groundwater extraction bores from the future site development).

However, if previously unidentified significant soil impacts (such as impacts associated with unexpected finds) are encountered during remedial and validation works, validation of groundwater beneath the site may be necessary.

Significant impacts would be indicated by the following:

- Noticeable odours in ambient air produced from the exposed soil;
- Pronounced, laterally extensive areas of soil staining;
- Elevated (>100 ppm) PID readings; and/or
- In the event of unexpected finds (refer to **Section 9.5** below) that could act as a source of subsurface impacts such as an underground storage tank (UST).

If additional groundwater validation is required, TRACE Environmental proposes to install and sample one to three additional monitoring wells (temporary) as necessary at appropriate locations (to be determined based on the nature and extent/location of the find and location of existing monitoring wells, if retained during the works). Permanent groundwater monitoring wells are not proposed as they would be destroyed during site redevelopment activities.

Should it be necessary, the scope of the groundwater validation works is outlined in the following sections:

Temporary Monitoring Well Installation and Sampling

The installation and sampling methodology adopted for the potential groundwater validation program conducted is detailed in **Table 8-3**, below.

Table 8-3: Potential Groundwater Validation Program

Activities	Details
Temporary Monitoring Bore Installation	If necessary, it is proposed to install one to three temporary monitoring bores to facilitate the collection of groundwater validation samples. The location of the well/s will be dependent on the location of the find but be placed near the find with emphasis on placing the well on the downgradient (i.e., west-northwest) side of the find. The temporary monitoring bore will be installed utilising direct push technology to a targeted depth of approximately 1 metre into the groundwater table to assess if any shallow groundwater impacts exist (a pilot boring using direct push sampling tubes will be advanced to determine the groundwater depth at the location prior to advancement of the temporary monitoring bore). At the targeted depth, an approximate 0.5 metre stainless screen will be exposed by retracting the drilling rods. The stainless-steel screen is 16.5 mm inner diameter and is equipped with a 41.275mm outer diameter stainless steel expendable plug. The stainless-steel screen is advanced inside of a 38mm sample sheath to the desired depth where the stainless-steel screen is extracted. The exposed stainless-steel screen will allow for groundwater sample collection at each temporary monitoring well location. Above the screen is the solid steel sampling sheaths which extend to approximately 0.5 metres above grade. Once sampling is complete, the screen is retracted leaving the expendable tip in the ground and withdrawn with the sampling sheaths.
Monitoring Well Gauging	The depth to water will be gauged in the temporary bore prior to sampling using a small diameter electronic water level meter. The diameter of the temporary monitoring wells is too small to utilise an oil/water interface probe.
Monitoring Well Purging	The temporary monitoring well/s will be purged using low flow sampling equipment or a bailer prior to sampling. Water quality parameters including temperature, electrical conductivity, dissolved oxygen, redox potential and pH will be measured and recorded during purging using a calibrated water quality meter. Well sampling will be completed following the stabilisation of the water quality parameters.
Monitoring Well Sampling	Sampling of the monitoring well/s will be completed using the same methods as for purging and completed following the stabilisation of the water quality parameters. The sample from the temporary monitoring well/s will be collected using low flow sampling techniques and collected into 40mL laboratory prepared vials preserved with hydrochloric acid, 500mL plastic bottles preserved with nitric acid and or 1L unpreserved amber glass bottles. All bottles will then be sealed immediately using a Teflon lined cap, labelled and placed on ice.
Field QC Samples	Field duplicate and triplicates for the groundwater samples will prepared in the field by collecting split samples from the same temporary monitoring well. Samples for duplicate analyses will generally be selected from locations characterised by odours, or the presence of sheen (if any). It is anticipated that one duplicate and one triplicate sample will be collected during the groundwater validation program. A trip spike and trip blank will also accompany the groundwater samples (if collected).
Sample, Labelling, Storage and Transport	All samples will be 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 will be labelled so as to not reveal their purpose or sample location to the laboratory. All samples will be kept chilled in an ice-filled esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures. By prior arrangement with the laboratories, samples will be extracted as soon as practicable after receipt by the laboratories.
Decontamination	During the gauging of groundwater monitoring wells, a water level meter will be used. The interface probe will be decontaminated between each temporary well location by scrubbing with a solution of Decon 90 (a phosphate-free detergent) followed by a rinse in potable water. New tubing and a new pair of nitrile gloves will be used at each temporary groundwater monitoring well location.

8.6 Analytical Program

8.6.1 Soil Validation Samples

Soil validation samples will be submitted to a NATA accredited laboratory for analysis. Soil validation samples will be analysed for the following:

- Validation samples collected from asbestos 'hotspot' excavations, deep soil zones (if any) and residual natural soils following removal of overlying fill material will be analysed for asbestos;

- Unexpected find validation samples will be analysed for the COPCs relevant to that find (to be determined by the appointed environmental consultant during assessment of the find).

8.6.2 Stockpile Samples for On-Site Re-Use

Soil samples collected from excavated material to determine the suitability for on-site re-use will be analysed for asbestos. Additional COPCs may be required if unexpected finds are encountered (refer to **Section 9.5** below).

8.6.3 Groundwater Samples

Groundwater sample/s, if required, will be collected from the existing and/or newly installed monitoring well/s and will be submitted for analytical testing at a NATA accredited laboratory. Groundwater samples will be analysed for COPCs associated with the site including TRHs, BTEXN, PAHs, eight heavy metals (dissolved), phenols, PCBs, VOCs, OCPs, and OPPs.

8.6.4 Laboratory Methods

Soil and groundwater samples will be analysed at NATA accredited laboratories in accordance with the analytical methods presented in **Tables 8-4** and **8-5** below.

Table 8-4: Summary of Soil Analytical Methods

Analysis	Analytical Method	LORs (mg/kg)
Metals (As, Cd, Total Cr, Cu, Pb, Hg, Ni, Zn)	US EPA 200.1	0.1 to 5
TRH Fraction F1 and F2 TPH C_6 to C_{40} BTEX	US EPA 500.2	25 to 100 0.1 to 1
Polycyclic Aromatic Hydrocarbons	US EPA 550.2	0.5
OCCs/OPPs	US EPA 550.2	0.05 to 2
PCBs	US EPA 550.2	0.1
Phenols	US EPA 550.2	0.2 to 20
Asbestos Quantification	EA200N	0.001 to 0.1%

Table 8-5: Summary of Groundwater Analytical Methods

Analysis	Analytical Method(s)	LORs
Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	USEPA 6020 ICP/MS	0.001 mg/L
TRH/TPH	USEPA 8260/8015 P&T-GC/MS/FID APHA 5520F	20-100 µg/L
BTEXN	USEPA 5030/8260 P&T/GC/MS or HS/GC/MS	1-5 µg/L
PAHs	USEPA 3510/8270	0.5-1 µg/L
Volatile Organic Compounds	USEPA 5030/8260 P&T/GC/MS	5-50 µg/L
Phenols	USEPA 3510/8270	1-2 µg/L
PCBs	USEPA 3510/8270	1-2 µg/L
OCCs/OPPs	USEPA 3510/8270	1-5 µg/L

8.7 Quality Assessment/Quality Control Program

The Quality Assurance / Quality Control (QA/QC) program will be assessed by data quality indicators as set out in the NSW EPA (2017) *Guidelines for the NSW Site Auditor Scheme (3rd Edition)*;

- Completeness – all critical locations will be sampled, samples will be collected from borings/monitoring wells, sample documentation will be complete, sample holding times will be complied with, appropriate methods will be used, and all documentation will be included in the report to demonstrate this;
- Comparability – experienced samplers will be used and the same approach to sampling will be taken, the same standard technical operating procedures will be used in the field on each occasion, climatic conditions will be recorded, same laboratories will be used for all primary samples. All deviation from the standard technical operating procedures will be discussed in the report;
- Representativeness – samples will be collected which represent the characteristics of the media sampled, samples will be homogeneous, appropriate collection, handling, storage and preservation will take place, and laboratory artefacts will be detected by the use of contaminant blanks (the DQIs for trip blanks will be non-detect);
- Precision – standard operating procedures will be complied within the field, laboratory and inter-laboratory duplicates, field duplicates and laboratory-prepared volatile trip spikes (70-130% of the original concentration) will be used and the coefficient of variance of field duplicates by relative percent difference (RPD) will be assessed; and
- Accuracy – standard operating procedures will be complied with in the field and analysis of laboratory blanks (the DQIs for laboratory blanks will be non-detected), controls and spikes (recoveries of 70 – 130% of original concentration) will be conducted to eliminate the bias associated with cross contamination.

8.8 QA/QC Program

The quality assurance program during the validation program includes the following:

- Preservation and storage of samples upon collection and during transport to the laboratory;
- Sample holding times;
- Use of appropriate analytical and field sampling procedures;
- Required limits of reporting; and
- Frequency of conducting quality control measures.

The quality control program will include the following:

- Rinsate and field blanks;
- Field duplicates - blind duplicates and inter-laboratory duplicates (split samples); and
- Data validation to assess for and clarify the occurrence of apparent unusual or anomalous results, e.g. laboratory results that appear to be inconsistent with field observations or measurements.

8.9 Field QA/QC

The field QA/QC program implemented during the validation program will include:

- Duplicate and triplicate samples split in the field and submitted to two separate laboratories in accordance with NEPM requirements. One duplicate per 20 primary samples and one triplicate per 20 primary samples submitted to the laboratory for analysis, will be collected for analysis;
- Rinsate blanks when reusable sampling equipment is used;
- Documentation of sample collection, handling and transportation procedures, appropriate to meet the project DQOs;
- Details of:
  - the sampling team;
  - sampling method(s), including the actual methods employed for obtaining samples, type(s) of sample containers, order and degree of filling, preservation, labelling, logging, custody;
  - evidence of appropriate decontamination procedures carried out between sampling events;
  - logs for each sample collected showing time, location, initials of sampler, duplicate locations, duplicate type, chemical analyses to be performed, site observations and weather conditions;
  - COC documentation fully identifying for each sample the name of the sampler, the nature of the sample, collection date, analyses to be performed, sample preservation method, departure time from the site and dispatch courier(s) and condition of samples at dispatch;
  - sample splitting techniques;
  - a statement of duplicate frequency for intra-laboratory and inter-laboratory duplicate samples and duplicate sample results; and
  - field blank results.

8.10 Laboratory QA/QC

All analytical laboratories used by TRACE Environmental are required to adhere to NATA endorsed methodologies and conduct regular control checks on their analyses. TRACE Environmental requires these laboratories to regularly provide results of control/method blanks, repeat duplicates and recoveries. The validation report will include details of:

- Analytical methods used for each potential contaminant in the matrix used by laboratories accredited for those analyses by NATA or an equivalent;
- Laboratory method detection limits for the chemicals of concern for use in the assessment of risk; and
- The following information:
  - A copy of signed chain-of-custody forms acknowledging receipt date and time, conditions of samples on receipt and identity of samples including in shipments;
  - Record of holding times and a comparison with method specifications;
  - Analytical methods used;
  - Laboratory accreditation for analytical methods used; and

- The results for blind duplicate samples collected from the field.

The project laboratory will also provide evidence of the following QA/QC procedures:

- Sample receipt and registration documentation;
- Instrument blank analyses;
- Surrogate spike and matrix spike analyses; and
- Laboratory duplicates.

Decontamination Procedures

All sampling equipment which will come into contact with the samples will be decontaminated before moving to the next location to avoid cross-contamination. A rinsate blank will be taken from the rinsate off the cleaned excavation and sampling equipment, when reusable sampling equipment is used.

Sample Storage, Preservation and Transport

Soil and groundwater samples will be stored in a cool esky containing ice immediately after they have been taken in accordance with AS4482.1-2005. Samples will be transported to the chosen laboratory within NATA recommended relevant holding times specified and with the relevant COC documentation.

Duplicate Samples (Intra-Laboratory Duplicates)

These samples identify the variation in analyte concentration between samples collected from the same sampling point and/or also the repeatability of the laboratory's analysis (AS4482.1, 2005). Blind duplicates will be collected at a ratio of 1 sample per 20 primary samples. Blind duplicates will be collected at the same time and in the same fashion as the primary sample.

Triplicate Samples (Inter-Laboratory Duplicates)

These samples provide a check on the analytical proficiency of the laboratories (AS4482.1, 2005). Triplicates will be collected at a ratio of 1 sample per 20 primary samples. Split samples will be collected at the same time and in the same fashion as the primary sample.

Rinsate Blank Samples

These samples will provide an indication of whether cross-contamination of analytes from the sampling equipment has occurred. Rinsate samples will be collected at a rate of one rinsate blank per day, per matrix, per piece of equipment (AS4482.1, 2005).

Trip Blank Samples

Trip blank samples will be prepared and transported with primary samples to ensure cross-contamination of samples has not occurred during transportation of the samples. The frequency of trip blanks will be a minimum of one per sampling event.

8.10.1 Laboratory Quality Assurance/Quality Control

Laboratory QA/QC will consist of the following procedures:

- Analysis and reporting of laboratory duplicates;
- Analysis and reporting of laboratory method blank samples;
- Analysis and reporting of internal laboratory standards and calibration blanks; and
- Analysis and reporting of laboratory control spikes, matrix and matrix spike duplicates (MS/MSD) and surrogate spikes.

8.10.2 Sample Holding Times

All samples will be delivered to the laboratory to ensure analysis of COPCs within holding times.

8.10.3 QA/QC Documentation

Documentation of the undertaken QA/QC program will include:

- The QA/QC checklist items in the NSW EPA (2000) *Guidelines for Consultants Reporting on Contaminated Sites* related to field quality assurance and quality control, laboratory QA/QC and data evaluation QA/QC;
- The names of the accredited laboratories used and relevant details of their accreditation for each analytical method;
- The laboratory LORs;
- The acceptance limit(s) for each QC test, such as duplicate RPDs and recoveries for laboratory quality control analyses;
- The QC results relevant to the sample analysis;
- For each sample, the highest measurement result wherever replicate measurements are taken (or all measurement results for each sample);
- Results for all data tabulated separately; and
- Analytical laboratory reports specifying compliance with the requirements of the NEPM and equivalence with the reference method or non-standard methods.

8.11 Sample Nomenclature

Soil and groundwater sample nomenclature employed throughout the investigation are provided in **Table 8-6** below.

Table 8-6: Soil and Groundwater Sample Nomenclature

Sample Recovery Method	Sample Nomenclature	Comments
Primary Soil Samples		
Soil Sample	VTP#/#.# SB#/#.# SP# EW#/#.# EB#/#.#	VTP# represents the location of a test pit, and #.# denotes the depth of the sample in metres. SB# represents the location of a borehole, and #.# denotes the depth of the sample in metres. SP# denotes the location of a sample collected from a stockpile. EW# and EB# represents the location of an excavation sidewall and excavation base sample respectively, and #.# denotes the depth of sample in metres.
Primary Groundwater Samples (if collected)		
GME Sample	MW-#	MW-# represents the location of the groundwater monitoring well
Soil QA/QC Samples		
Duplicates	QS-#	QS-# represents the duplicate sample collected
Triplicates	QS-#A	QS-#A represents the triplicate sample collected
Trip Blank	TB-#	TB-# represents the trip blank sample collected
Water QA/QC Samples		
Duplicates	QW-#	QW-# represents the duplicate sample collected (if collected)
Triplicates	QW-#A	QS-#A represents the triplicate sample collected (if collected)
Trip Blank	TB-#	TB-# represents the trip blank sample collected
Rinsate Blank	QW-#	QW-# represents the rinsate blank sample collected

8.12 Reporting

At the successful completion of the proposed validation works, a comprehensive Validation Report detailing the findings at each stage will be prepared in accordance with NSW EPA (2000) *Guidelines for Consultants Reporting on Contaminated Sites*. Multiple validation reports may be required depending on the staging of the validation works. Each report will include the following components:

- An executive summary;
- Scope of work;
- Site identification details;
- A summary of the site history investigation findings;
- Details of the site conditions and surrounding environment;
- Local and regional geological and hydrogeological conditions;
- A summary of the sampling and analysis plan and investigation sampling methodologies;

- Identification of the field and laboratory QA/QC performed;
- An evaluation of QA/QC data;
- Identification of regulatory criteria, assumptions and limitations associated with adopting the criteria for the investigation;
- Soil and groundwater assessment analytical results;
- Evaluation of potential risks to human health and/or the environment;
- Evaluation of potential impacts on buildings and structures from residual contaminants (if any);
- A discussion on the implementation of the RAP; and
- Conclusions and recommendations.

It is also noted that the Validation Report/s will also provide information required by the NSW EPA (2017) guidelines, which includes (but not limited to):

For waste classification:

- Waste classification document;
- Material source and description;
- Sampling density, pattern, COPCs;
- Result summary, including appropriate table with comparison to acceptance criteria; and
- Waste classification.

For off-site disposal works:

- Source location;
- Estimated volume (based on excavation size);
- Actual volume of disposal;
- Waste classification;
- Transporter (waste classification dependent);
- Final destination, PoEO licence;
- Reconciliation of waste dockets with actual disposal volume; and
- Reconciliation of actual disposal volume and the estimated volume of disposal (based on excavation size).

The Validation Report/s will also include a registered survey plan showing the lateral coordinates of the site, as well as a survey of road areas where materials exceeding Residential B and/or ecological criteria (but meets Commercial/Industrial D criteria as appropriate for roads) have been placed.

As the site is understood to be progressively validated in separate stages, separate Validation Reports will likely be required following successful completion of the remedial works and follow-up validation at each stage.

9 Site Management Plan

The following sections describe environmental risks and controls required to minimise the impact of works on the environment and the community. In all cases, environmental issues must be managed by the Principal Contractor in accordance with best environmental management practices and supervised by the appointed environmental consultant. The purpose of these measures is to prevent public and environmental exposure to potential health risks associated with these works.

9.1 Stockpile Management

If possible, soil to be removed from site (if any) should be loaded immediately into a truck licensed to transport contaminated soil. However, soil may require temporary stockpiling based on the availability of transport trucks. Soil placed in stockpiles around the site will be tracked according to the location of removal and location of stockpile. Stockpiles in place longer than 24 hours will be placed on an impervious base and covered by black plastic, with silt traps appropriately placed to avoid sediment loading of stormwater drains and pipes.

9.2 Excavation Water Management

Any water contained or that collects in the soil excavations will be vacuum pumped out of the excavation by a licensed liquid waste contractor and disposed at a NSW EPA licensed liquid waste treatment facility. Larger volumes of water, if required, may be disposed to sewer under a specific Trade Waste Agreement with Sydney Water.

9.3 Air and Dust

9.3.1 Odours

Due to the nature of impact on-site, it is not anticipated that excessive odours will result from remediation works. However, qualified and experienced technical staff will be on site during all excavation works and should excessive odour be generated as a result of the process, on-site spraying of the excavated material with a suitable odour suppressant (i.e. Anotec) will be undertaken to suppress the odour. Other options that may also be employed are:

- A reduction in the size of the excavation face that is open at any one time to reduce the surface area generating the odour;
- Location of any temporary stockpiles of impacted soil as far as possible (and in the predominant down wind direction) from sensitive receptors;
- Smothering of the odours by covering the portion of the site that is generating the odour; and
- Watering the stockpiles and excavations to minimise volatile emissions.

During excavation works, a PID and a Lower Explosive Limit (LEL) meter will be used to obtain readings and document VOC concentrations during activities when soil and groundwater are being disturbed. Commercial odour suppressant will be used if PID measurements in worker breathing zones exceed 15 ppm for over 30 minutes (based on short term exposure limit of 15ppm for benzene – *National Occupational Health and Safety Commission, "Exposure Standards for Atmospheric Contaminants in the Occupational Environment", NOHSC:1003* (1995), Canberra). If the odour suppressant does not reduce vapour, the site will be evacuated until adequate mechanical or natural ventilation can be put in place to reduce vapours to safe levels.

9.3.2 Dust Control

Civil contractors will be responsible for ensuring that excavation, loading, carting, and stockpiling operations are dust free. This may include (but is not limited to):

- Stockpile protection;
- Water application on stockpiles and access roads;
- Limiting the area of exposed excavations and surfaces; and
- Wind fences around earthworks areas.

In the event that excessive dust is generated during any operations on-site, the works will cease and modifications to the process will be made before the operation is resumed. There must be no observable dust transport off-site.

9.4 Remediation of Asbestos Waste

9.4.1 Methodology

Sub-Contractors working with asbestos or in asbestos affected areas of the site will be required to prepare and lodge a safe work method statement for the Principal Contractor's approval before commencing work. The chosen remedial contractor will be a Class A licensed asbestos removalist.

To the extent practical, all asbestos waste and debris within the identified hotspots on site should be progressively removed and stockpiled (further discussed in **Section 9.4.2** below). If asbestos impacted fill material is required to be removed from the site, then the material should be progressively removed and directly transported and disposed to an appropriately licensed landfill immediately following removal in such a manner to prevent any build-up of debris that could affect access within the site or become a workplace hazard.

All removal works will be in accordance with the codes, guidelines and Standards referenced in **Section 1.4**.

9.4.2 Stockpiling

For the stockpiling of asbestos waste, the impacted material should be stockpiled on-site, prepared in accordance with referenced codes, including but not limited to:

- Stockpile asbestos impacted material away from adjacent land uses and other stockpiles,
- Stockpiles of asbestos impacted material should be placed ideally over a concrete or bitumen paved area, or be lined with minimum thickness of 200 micron heavy duty plastic sheet, formed and sealed to ensure leachate from asbestos contaminated material does not escape;
- Asbestos impacted material shall be lightly wetted regularly to reduce dust generation while loading and prior to plastic encapsulation;
- Asbestos impacted material shall be double wrapped in minimum thickness of 200 micron heavy duty plastic sheet or bagged in specific asbestos bags to code requirements;
- Silt traps should also be appropriately placed to avoid sediment loading of stormwater drains and pipes, sandbagged or otherwise block any drainage around the stockpile; and
- Barricade the perimeter of the stockpiled asbestos waste.

9.4.3 Decontamination

Adequate decontamination facilities are to be installed onsite in accordance with the guidelines specified in the Code of Practice for the Safe Removal of Asbestos [NOHSC2002 (2005)] and the NSW Work Health and Safety Regulation 2017 and any amendments.

9.4.4 Respiratory Protection

All persons engaged in asbestos removal work or accessing a contaminated area shall wear an approved respirator conforming to the requirements of SA/NZS 1715 and 1716.

9.4.5 Warning Notices

Suitable warning signs shall be placed around the works area. These signs shall comply with all relevant acts, regulations and codes of practice, including but not limited to:

- AS 1319-1983 – Dangerous Goods Act 1985;
- Dangerous Goods (Storage & Handling) Regulations 2000; and
- Dangerous Goods (Placarding of Workplaces) Regulations 1985.

9.4.6 Loading and Transport of Asbestos-Contaminated Materials

Where asbestos impacted waste is disposed off-site, this material is to be removed and disposed of in accordance with all relevant acts, regulations, standards and codes of practice.

Removal of waste materials from the site shall only be carried out by a licensed contractor holding appropriate licenses, consents and approvals from NSW EPA, SafeWork NSW and/or other Authorities to transport and dispose of the asbestos waste materials according to the classification guidelines.

Asbestos waste must be transported in a covered leak-proof vehicle to prevent any spillage or dispersal of waste. Bonded asbestos not stored in a bag must be wetted before it is transported offsite. Asbestos fibres and dust waste are classified as friable and must be covered in a manner to prevent the emission of any dust.

Details of all contaminated materials removal from the site shall be documented with copies of weighbridge slips, trip tickets and consignment disposal confirmation (where appropriate). Such information should be provided to the Site Owner for reporting purposes. A site log shall be maintained by the licensed removal contractor for all waste stockpiles (numbered locations), to enable the tracking of disposed loads against on-site origin and location of the materials.

Measures shall be implemented to ensure no asbestos contaminated material is spilled onto public roadways or tracked off-site on vehicle wheels. Such measures could include the deployment of a vehicle washing/cleaning facility, which should be placed at a location before the site egress. The facility shall be capable of handling all vehicles and plant operating on site. Residue from the cleaning facility will be deemed contaminated unless shown by validation to be below Remediation Acceptance Criteria.

The proposed waste transport route should be approved by council. Each load leaving the site shall be recorded. Any vehicle used for the transport of contaminated waste must be inspected before leaving the site to ensure that all residual waste is removed from the outside of the vehicle.

9.4.7 Asbestos Fibre Air Monitoring

To date, respirable asbestos fibres have not been detected in the majority of samples retrieved from the site. However, friable asbestos (FA) and/or asbestos fines (AF) have been reported in samples collected from TRACE Environmental (2018) investigation locations BH4, BH23, TP5 and TP20 (refer to **Figure 3** for sampling locations). AF and FA have the potential to generate respirable asbestos fibres that may pose a risk to site workers. Therefore, it is recommended that asbestos air monitoring be undertaken during the remediation of these asbestos impacted hotspots. Ongoing air monitoring may be required subject to the results of the air monitoring for areas of AF and FA.

Further air monitoring may be required depending on the results of classification and validation testing, and/or if unexpected asbestos finds are encountered (refer to **Section 9.5** below for additional information). If significant amounts of bonded asbestos are encountered, consideration would also need to be given to the nature of the encountered materials (i.e., if friable materials are present) and if extensive mechanical excavation is required that may disturb these materials and potentially generate fibres.

A qualified Class A Licensed Asbestos Assessor shall carry out appropriate air monitoring of the workplace and surrounding areas during asbestos remediation/removal works in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSC:3003(1988)] including but not limited to:

- Air monitoring at the commencement of asbestos removal activity on the site;
- Air monitoring continuously in areas related to hazard removal work; and
- Air monitoring for clearance following removal of friable asbestos.

Air monitoring results are to remain below control levels in designated areas and monitored by the environmental consultant / hygienist. These control levels are occupational hygiene best practice and are not health-based standards (they are below the concentration set in NES for asbestos).

The control levels shall be as follows:

Control level (airborne asbestos fibres/ml)	Control/Action
< 0.01	Continue with control measures
≥ 0.01	Review control measures
≥ 0.02	Stop removal work and find the cause

9.4.8 Clearance Inspections

Following the removal of asbestos-contaminated materials, an inspection must be carried out by a licensed asbestos assessor, in order to establish areas which may require further remediation, and an asbestos clearance certificate is to be provided following such clearance. All asbestos waste material must be removed from the work area prior to a clearance inspection.

The licensed asbestos assessor may terminate the inspection if the work area is deemed to be contaminated and reconvene the inspection after follow-up remediation works to a satisfactory standard.

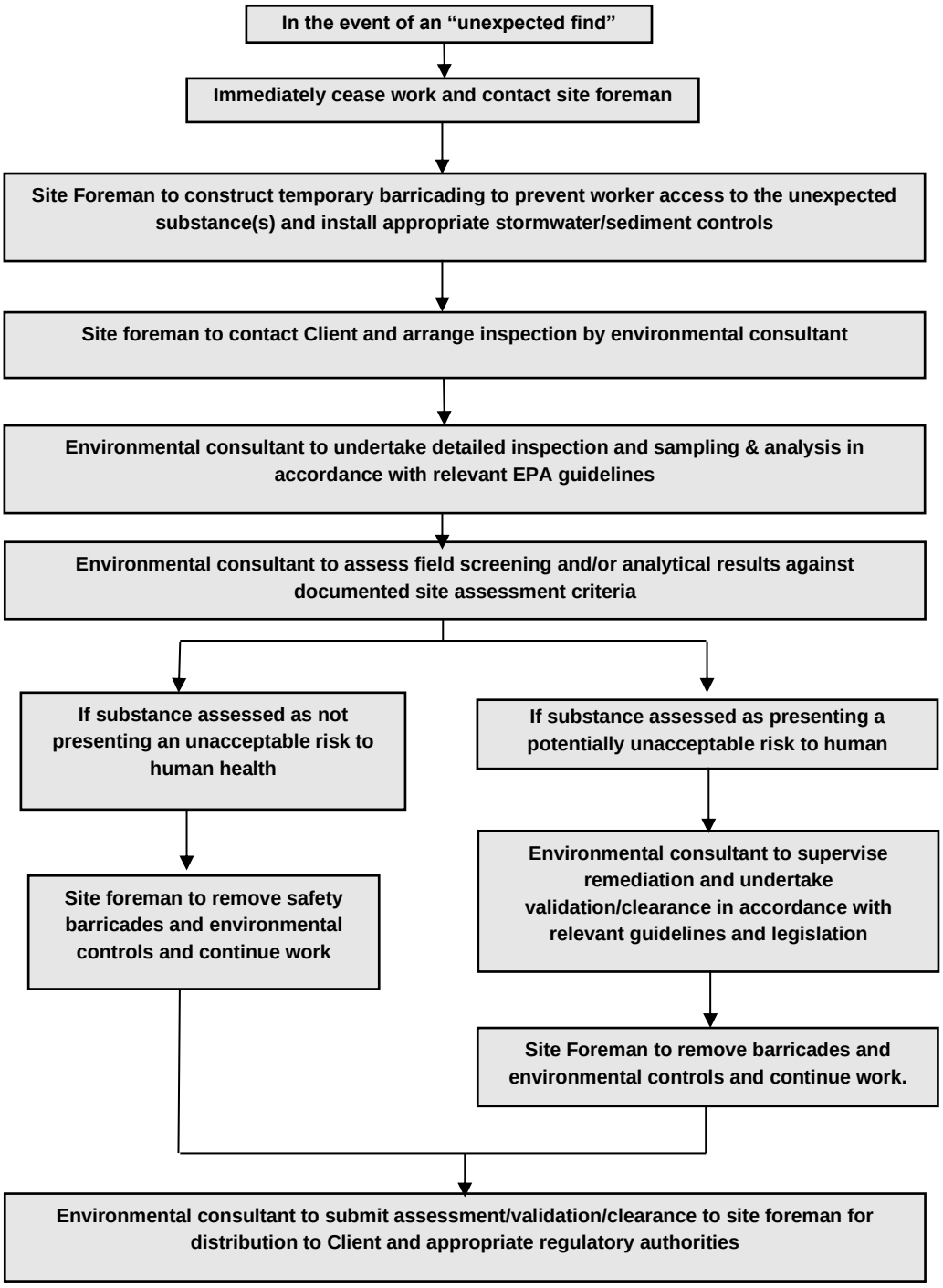
9.5 Unexpected Finds

Workers will be vigilant for hazardous materials that may be uncovered during excavations. Unexpected finds include, but are not limited to, odour, visual contamination, deleterious material inclusions, asbestos containing material (i.e., at areas that are in addition to the previously identified hotspots), USTs, chemical storage drums or any other suspect materials. Any unexpected finds will be reported to the Contractor's on-site manager immediately. To ensure the protection of the workforce and surrounding community, should any of the substances or items listed above be identified (or any other unexpected potentially hazardous substance), the procedures summarised in the Flowchart below are to be followed. An enlarged version of the unexpected finds protocol Flowchart, suitable for use on-site, should be posted in the site office and referred to during the site-specific induction.

If hazardous materials are uncovered / discovered during excavations the Contractor shall cease all work in that vicinity (and fence the area if appropriate), investigate the nature of the risk of the materials, determine the appropriate response and document the actions in accordance with contractual obligations. The contractor will inform the site owner/occupier and the appointed environmental consultant immediately following an unexpected find. Blacktown City Council and the NSW EPA should be informed in the event of a serious unexpected find which could cause harm to human and/or the environment.

Validation of unexpected finds will depend on the nature of the find but will be conducted in general accordance with the frequencies outlined above in **Section 8.5.1**. If soil sample analytical results from unexpected find areas are reported at concentrations exceeding the applicable guideline criteria as noted above in **Section 7**, and/or aesthetically unsuitable materials (odours and any discolouration of the soil as a result of contamination) are encountered, these materials will be classified for off-site disposal per the NSW EPA (2014) *Waste Classification Guidelines*.

Flowchart - Unexpected Finds Protocol



9.6 Stormwater

9.6.1 Erosion and Sediment Control

The following erosion and sediment controls will be implemented during soil excavation works:

- Limiting the extent of cleared areas and exposed excavations;
- Backfilling of excavated areas as soon as practicable;
- Diversion of stormwater from active areas using hay bales or sediment fences;
- Covering of temporary stockpiles with plastic (HDPE) and placement of silt socks around excavations when necessary;
- Covering open stormwater grates in the vicinity of stormwater pits and excavations with silt fences or other appropriate materials;
- Placement of stockpiles away from footpaths, roadways, kerbs, access ways or drainage lines;
- Minimising translocation of contaminated soils throughout the site by ensuring excavator operators do not track over contaminated areas;
- If possible, a single vehicle entry and exit to minimise translocating soil;
- Depending on the volume of soil to be excavated, rumble strips may be required at the site access in order to prevent contaminated soil being transported off-site; and
- Depending on the volume and/or nature of asbestos impacted soils/materials encountered during the works, a truck wheel wash station may be required for trucks leaving the site to minimise potential for asbestos impacted soil to be tracked off-site.

9.6.2 Water Management

Stormwater runoff quality may be adversely affected in the event of rainfall. Hay bales will be placed near down-gradient stormwater entry points (if present) to prevent entry of contaminated sediment to stormwater, which may result from the project works.

9.7 Noise

Hours of operation will comply with Council requirements to control noise from site works.

9.8 Land Disturbance

Works include excavation, loading, carting and stockpiling operations of associated soils. These works shall be carried out in an orderly manner to minimise impact to the surrounding residences.

- Excavation - the removal of soil shall be performed by the appointed excavation contractor using an excavator. If a transport truck is not on-site during excavation and soil will need to be temporarily stockpiled, no contaminated soils should be placed on areas validated as suitable for the proposed land uses. In these locations, soil shall be excavated and placed on black plastic liners or on concrete surfaces in discrete stockpiles prior to off-site disposal. Stockpiles should be segregated for each potential contamination source; and

- Loading and Carting – the loading of the stockpile material shall occur with an appropriately sized loader. The trucks and trailers shall be covered for transport as deemed necessary, and shall meet any other statutory requirements.

9.9 General

The appointed Principal Contractor shall ensure compliance with relevant SafeWork NSW guidelines and Work Health and Safety (WHS) Regulations. The Principal Contractor shall also ensure compliance with any amendments to the Act or Regulations during the project duration.

The Principal Contractor shall monitor and control the access of all persons to the site and ensure that no unauthorised persons enter the site during remedial works (wherever practicable). All site personnel and visitors will be inducted and shall wear appropriate personal protective equipment (PPE).

The appointed Principal Contractor shall undertake additional underground and overhead service location specifically in areas surrounding the remediation location.

Any open excavation(s) are to be managed accordance with Part 6.3 of the NSW Work Health and Safety Regulation 2017.

The appointed Principal Contractor shall install warning signs on the barricades surrounding the excavations, including but not limited to: DANGER: OPEN EXCAVATIONS; DANGER: NO SMOKING.

9.9.1 Vehicles

The appointed Principal Contractor shall ensure all vehicles are suitably contained and covered in the transport of all debris, spoil, rubbish and materials to or from the site, such that spillage or contamination of adjoining and other areas or property shall be prevented.

Vehicles shall also be maintained to prevent the transfer of mud or wastes onto adjacent streets or other areas. If wheel treads contain significant quantities of site soils the contractor will manually remove and dispose in stockpiles.

9.9.2 Traffic Control

The Principal Contractor shall supply signs and safety cones; erect at the appropriate entry and exit points; and maintain these devices in good condition. Excavation works, stockpiles and other hazards, shall be individually barricaded at all times. The site will be fully fenced to exclude public.

On-site pedestrian traffic will be averted from the work areas and excavation by means of signage, fencing and safety barricading.

9.9.3 Refuse Disposal

All site refuse, including food, equipment wrappings, unused materials, etc. shall be handled and disposed of appropriately into a skip.

9.9.4 Site Security

The site shall be secured by a lockable fence around the perimeter of the site and access to the site will be restricted. All excavations and above-ground remediation equipment will be barricaded with reflective barricades, with pertinent reflective signage. Keys to the gate will be restricted to approved personnel.

9.9.5 Training

Low environmental awareness of site workers may result in environmental impact including cross contamination of soil layers and off-site movement of contaminated soil. Accordingly, staff awareness training, inductions and daily tool box meetings shall be conducted.

9.9.6 Complaints Management/Community Relations

Any complaints (if lodged) from adjoining residents or on-site workers should be directed to the Principal contractor in the first instance. Should the issue remain unresolved, the remediation consultant should then be contacted. Additional discussion between the remediation consultant and the complainant will further investigate the issue and remedy as required.

9.9.7 Roles and Responsibilities

The primary project team would consist of TRACE Environmental personnel working with a remedial subcontractor to undertake the soil works. Additionally, TRACE Environmental would engage an environmental analytical laboratory to analyse the validation samples in accordance with NATA standards. The laboratory that would be used in this project has not been chosen to date. The primary contacts from TRACE Environmental are listed in **Table 9-1**, below.

Table 9-1: Roles and Responsibilities

Name	Affiliation	Role	Telephone	Email
Ken Henderson	TRACE Environmental	Project Director	02 8960 0555	ken@traceenviro.com
Matt Vanderheyden	TRACE Environmental	Project Manager	02 8960 0555	mvanderheyden@traceenviro.com
TBA	Paynter Dixon	Client Contact	TBA	TBA
TBA	Blacktown City Council	Council Contact	TBA	TBA

10 Occupational Health and Safety

10.1 WHS Planning and Preparation

Prior to mobilising to complete the remedial works, the Principal Contractor and appointed remedial contractor will develop site and project specific Health and Safety Plans (HSPs), Safe Work Method Statements (SWMS) and Job Safety Analyses (JSAs) for the scope of works to be undertaken. In addition, the appointed environmental consultant will prepare WHS documentation (i.e., HSP, SWMS and JSAs) for environmental aspects associated with remedial works. The WHS documentation will detail measures to mitigate potential risks to site workers, third parties and the local environment during the remedial works. General, minimal WHS procedures to be implemented during the remedial works are outlined as follows:

- The contaminants identified are not volatile, thus under ambient conditions there is low potential for exposure to contaminants via inhalation. Respirators and dust masks should be available on site should conditions arise that create a potential localised exposure to site staff;
- Potential exposure pathways for contaminants include dermal absorption (skin contact, ingestion) of dust. All workers should wear long sleeve trousers/shirts on-site. Gloves and safety glasses shall be worn by all workers involved in handling of potentially contaminated soils;
- Protective footwear (steel capped boots) to be worn on site at all times;
- Hearing protection should be worn during soil removal activities (or when working in the vicinity of heavy plant/machinery);
- Unauthorised access should be limited by ensuring that security gates are locked at the completion of each day's work;
- Excavations greater than 1.5m depth need to be "stepped" by the appointed civil contractor;
- Personnel are not to enter excavations (>1m depth) at any time; and
- PPE shall be provided in sufficient quantities to provide for the duties of each on-site individual.

10.2 Incident Management Plan

Emergency response includes pre-emergency planning, lines of authority and communication, emergency recognition and prevention, site control, evacuation routes, decontamination and first aid.

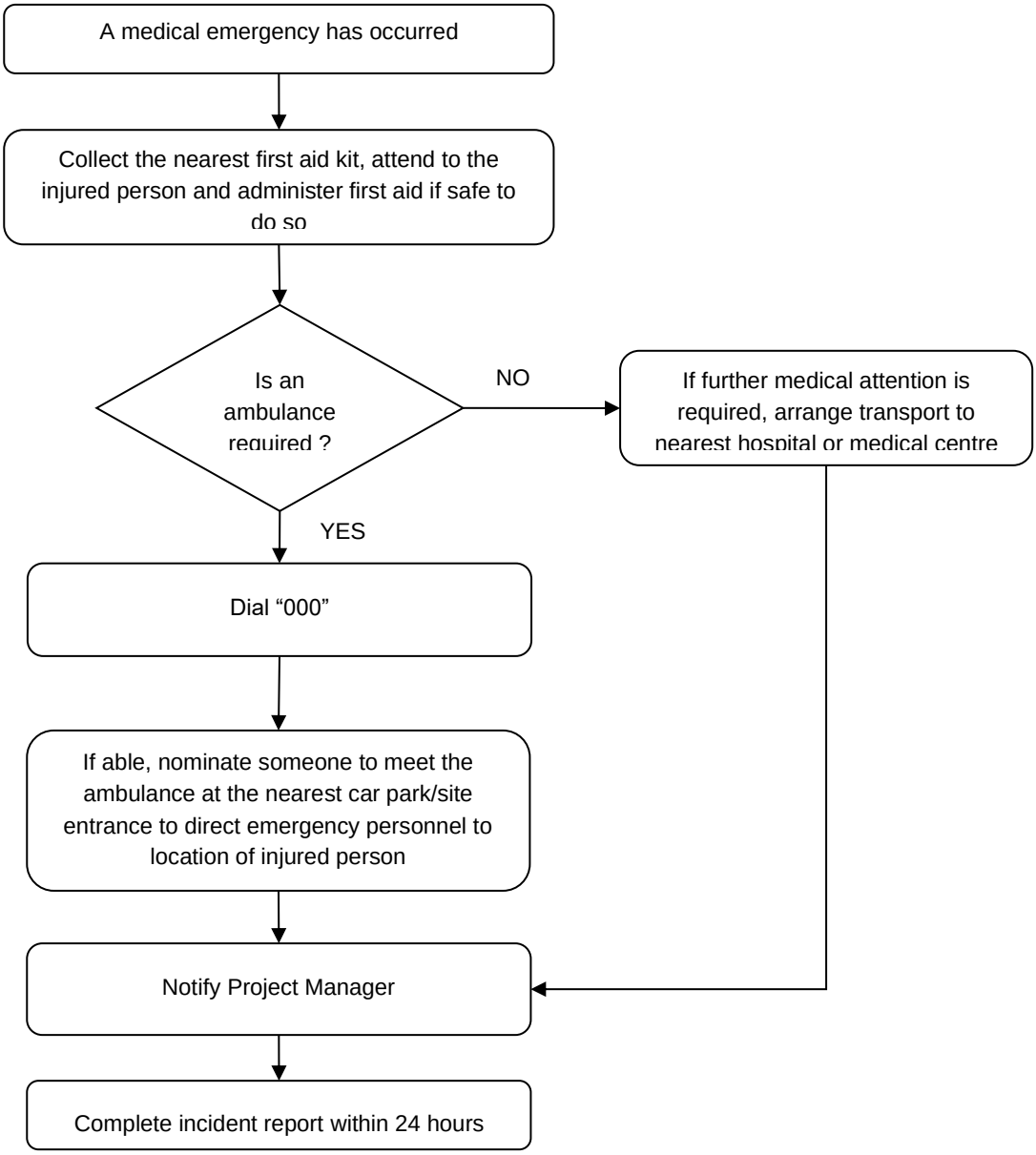
10.2.1 Medical Emergency/Serious Injury

In the event of an accident or an emergency situation involving a serious injury or medical emergency, immediate action must be taken by the first person to recognise the event (refer to flowchart below).

A portable and fully-stocked first aid kit shall be retained on site at all times.

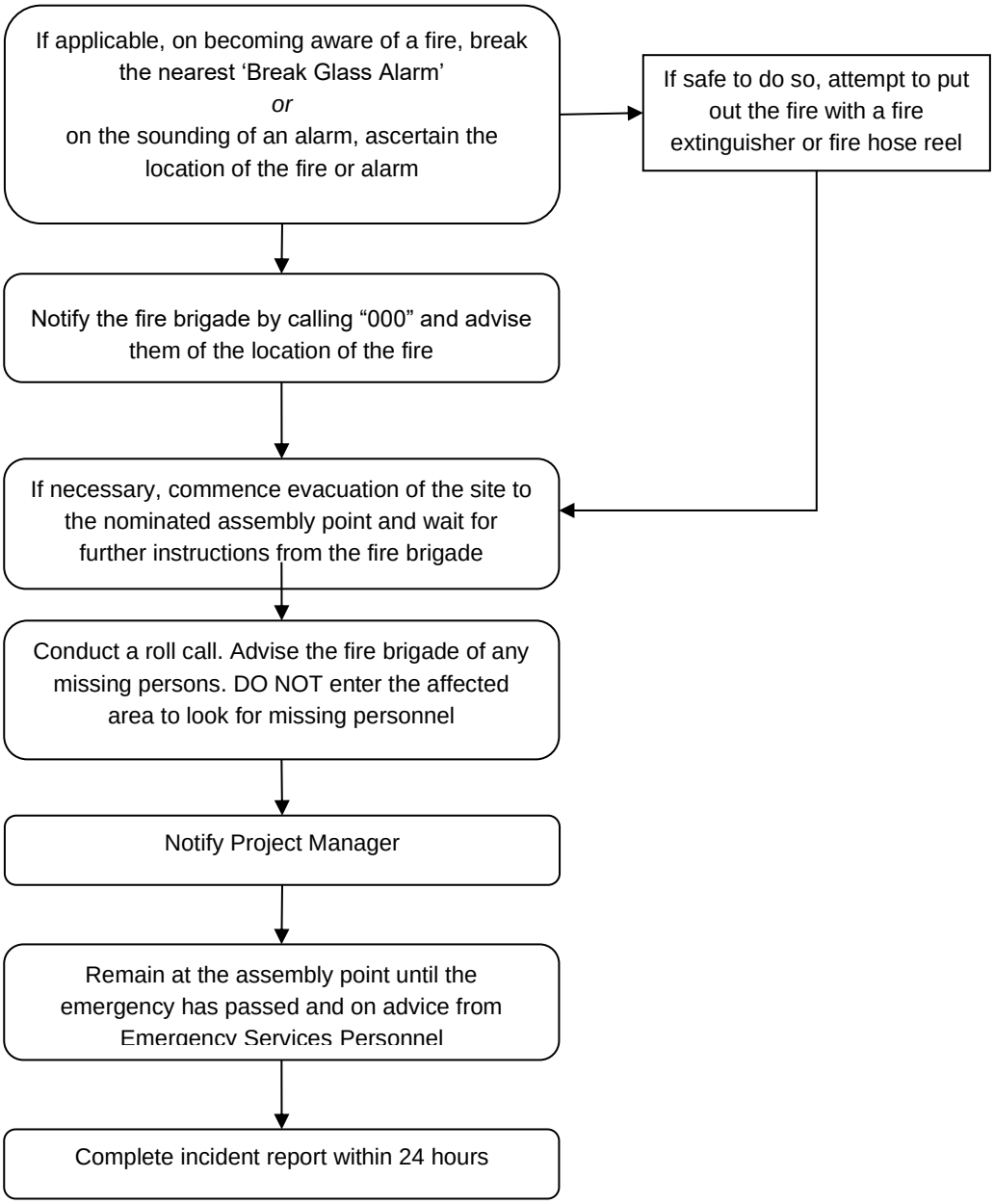
Following the occurrence of an emergency situation, the appropriate personnel shall be contacted using the emergency telephone numbers provided above in **Table 9-1**.

In the event of a fatality, the Police and the State Manager shall be notified immediately.


A medical emergency has occurred
Collect the nearest first aid kit, attend to the injured person and administer first aid if safe to do so
Is an ambulance required ?
NO
If further medical attention is required, arrange transport to nearest hospital or medical centre
YES
Dial “000”
If able, nominate someone to meet the ambulance at the nearest car park/site entrance to direct emergency personnel to location of injured person
Notify Project Manager
Complete incident report within 24 hours

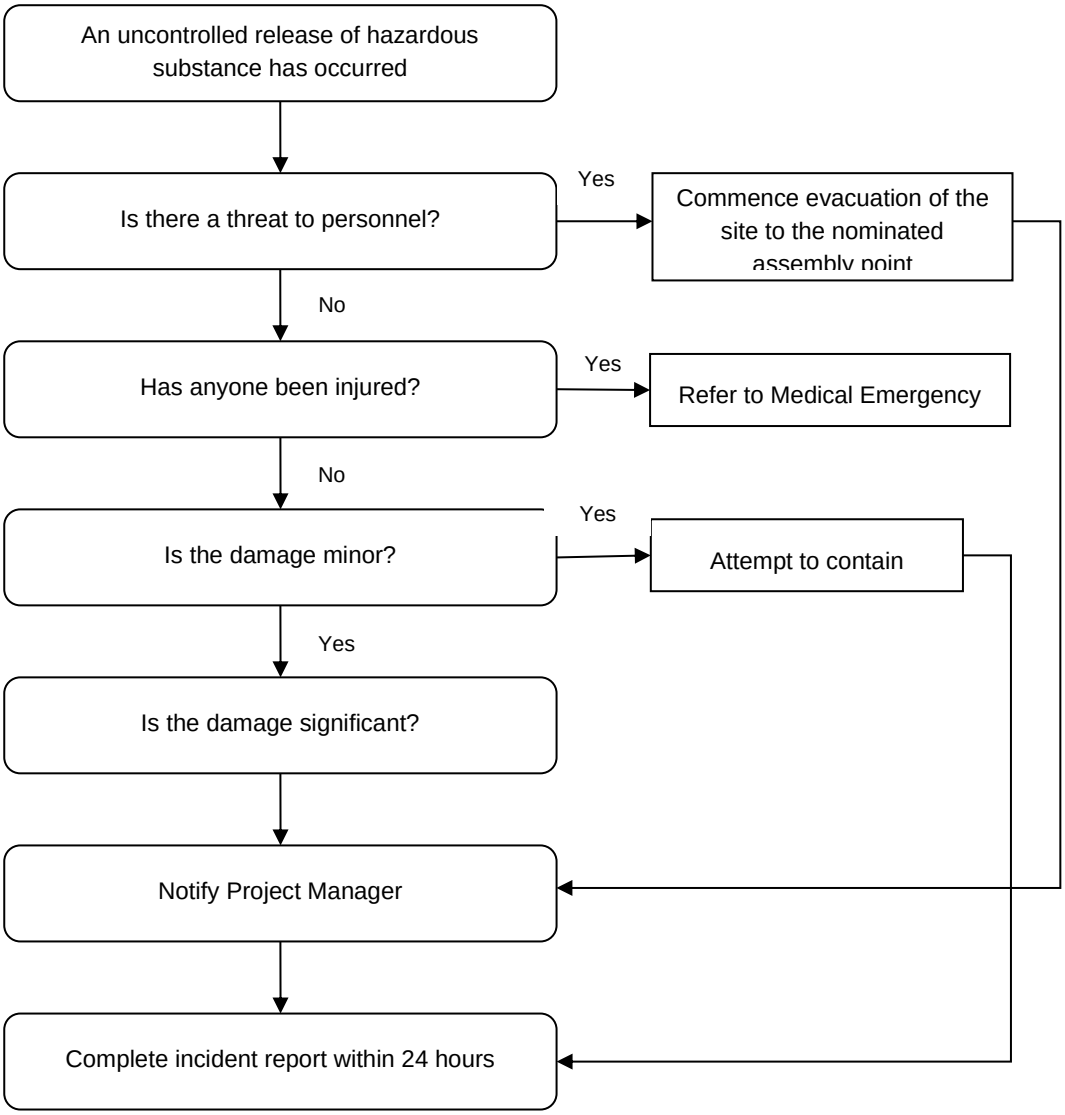
10.2.2 Fire

In the event of a fire, the actions outlined in below shall be taken:



10.2.3 Environmental Incident

In the event of an environmental incident, the actions outlined below shall be taken:



10.3 Incident Reporting

TRACE Environmental employees and sub-contractors are required to verbally report incidents, accidents and near-misses to the Project Manager immediately after an event has occurred. It is the responsibility of the Project Manger to notify the Client Representative immediately after the occurrence of an environmental incident and to forward the completed a written incident report within 24 hours. Additional investigations may be necessary should a serious incident occur.

11 Licences and Approvals

11.1 Waste Classification Guidelines (NSW EPA 2014)

All wastes generated at the site shall be assessed, classified and managed in accordance with the NSW EPA (2014) *Waste Classification Guidelines. Part 1: Classifying Waste*.

11.2 Scheduled Activities Under the Protection of the Environment Operations Act 1997

Clause 15 of the POEO Act 1997 applies to contaminated soil treatment, meaning the on-site or off-site treatment of contaminated soil (including, in either case, incineration or storage of contaminated soil but excluding excavation for treatment at another site).

The activity to which this clause applies is declared to be a scheduled activity if:

(a) in any case, it has the capacity to treat more than 1,000 cubic metres per year of contaminated soil received from off site, or

(b) where it treats contaminated soil originating exclusively on site, it has a capacity:

(i) to incinerate more than 1,000 cubic metres per year of contaminated soil, or

(ii) to treat (otherwise than by incineration) and store more than 30,000 cubic metres of contaminated soil, or

(iii) to disturb more than an aggregate area of 3 hectares of contaminated soil.

The proposed remediation/validation activities are not considered to be scheduled activities under the Protection of the Environment Operation Act 1997 (i.e., are not considered activities for which a licence is required) since the works do not treat contaminated soil on-site, and do not:

- Incinerate more than 1,000 cubic metres per year of contaminated soil, or
- Treat (otherwise than by incineration) and store more than 30,000 cubic metres of contaminated soil originating exclusively from the site, or
- Disturb more than an aggregate area of 3 hectares of contaminated soil.

11.3 Environmental Planning and Assessment Regulation 2000 (Sched. 3 Designated Development)

Schedule 3 of the Environmental Planning and Assessment Regulation 2000 applies to development (described in Part 1 of Schedule 3) which is declared to be designated development for the purposes of the Act unless it is declared not to be designated development by a provision of Part 2 or 3 of that Schedule. The proposed development of the site does not include development described in Part 1 of Schedule 3, and as such is not declared to be designated development.

11.4 Protection of the Environment Operations (Waste) Regulation 2014

The POEO (Waste) Regulation 2014 makes requirements relating to non-licensed waste activities and waste transporting. The proposed remediation works at the site will not require licensing. However, Part 7 of the

Regulation outlines the transportation and management requirements of asbestos waste. For the asbestos impacted material identified at the site, as well as any unexpected finds, Part 7 of the Regulation applies to any activity that involves the transportation, disposal, re-use or recycling of any type of asbestos waste, regardless of whether the activity is required to be licensed.

11.5 Protection of the Environment Operations (UPSS) Regulation 2014

The UPSS Regulation was revised in September 2014 to clarify the statutory requirements for the management and operation of underground petroleum storage system (UPSS) infrastructure in NSW. No UPSS infrastructure was observed or reported to be at the site, and as such the requirements of the UPSS Regulation 2014 do not apply to the site.

11.6 Asbestos Removal Regulations and Code of Practice

The remediation and/or removal and disposal of asbestos impacted fill material during future site redevelopment will be managed in accordance with the Work Health and Safety Regulation (2017) and Work Health and Safety Act (2011), SafeWork NSW codes of practice including *How to Manage and Control Asbestos in the Workplace Code of Practice* and *How to Safely Remove Asbestos Code of Practice*, SafeWork NSW Guidelines and the NSW *EPA Waste Classification Guidelines*.

11.7 State Environmental Planning Policy (SEPP 55) Remediation of Land

In consideration of the requirements of SEPP 55, the remediation works are understood to be included with the development approval required for the associated site development works.

The proposed remediation works are classified as 'Category 2' Remediation Works (i.e., not requiring consent). The notification requirements of SEPP 55 include notification to council 30 days before commencement of Category 2 remediation works.

The notification will provide Council with the information needed to verify the work is not Category 1. Category 1 remediation work is a remediation work that is:

- Designated development (under schedule 3 of the EPA&A Regulation or under a planning instrument), or
- Carried out or to be carried out on land declared to be a critical habitat, or
- Likely to have a significant effect on a critical habitat or a threatened species, population or ecological community, or
- Development for which another State environmental planning policy or a regional environmental plan requires development consent, or
- Carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:
  - coastal protection;
  - conservation or heritage conservation;
  - habitat area, habitat protection area, habitat or wildlife corridor;
  - environmental protection;

  - escarpment, escarpment protection or escarpment preservation;
  - floodway;
  - littoral rainforest;
  - nature reserve;
  - scenic area or scenic protection;
  - wetland, or

- Carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated (or if the land is within the unincorporated area, the Western Lands Commissioner).

Notification will also include relevant contact details and a proposed remediation schedule, and notice is required to be given to Council within 30 days of completion of the remediation works.

11.8 Aquifer Interference Policy and NSW DPI Water Permit under the Water Management Act 2000

Based on observations and groundwater data collected during the recent DSI, and with consideration of the depth of the proposed basement, the proposed extent of the excavation is likely to intersect groundwater. Subsequently, dewatering may be required during the site development, either during construction or post-construction as part of the building basement design (including potential foundation dewatering). Should building basement excavation or ongoing maintenance require dewatering, a licence will be required from NSW Department of Primary Industries (DPI) Water for the proposed works.

The remedial works may include removing relatively large volumes of soil, and while currently considered unlikely, may require collecting and removing shallow perched groundwater, which may lead to a temporary change in the local hydrogeological conditions. If this occurs, the NSW DPI Water may need to be consulted to determine any requirements under the Aquifer Interference Policy. The standard Aquifer Interference Assessment Framework form will be used to assess the impact of the remedial activities.

11.9 Discharge of Contaminated Groundwater under Trade Waste Agreement

Groundwater, if encountered, may require collection and possible treatment prior to disposal. Should any collected groundwater be determined unsuitable for disposal to stormwater, treatment or disposal to sewer under a specific Trade Waste Agreement with Sydney Water may be required.

11.10 Guidelines on the Duty to Report Contamination (EPA 2015)

Following review of the validation analytical results, the appointed environmental consultant will conduct a review of the historical data and the data obtained during validation to the requirements of the NSW EPA 2015 *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act* and make an assessment as to whether the site will need to be reported to the NSW EPA.

12 Remedial Action Plan Summary

Environmental investigations undertaken at the site (including the recent TRACE Environmental 2018 DSI) have identified asbestos impacted fill material across portions of the site which require remediation to make the site suitable for the proposed medium to high-density residential, aged care and communal/recreational open space land uses. These impacts are considered to be associated with the site's historical import of fill material, and potential asbestos-containing building materials associated with demolition of historical site structures.

Asbestos was identified in fill material at concentrations exceeding the adopted human health assessment criteria at six locations in the upper (i.e. eastern) playing field, and at one location at the northern boundary of the lower (i.e. western) playing field. A figure of the site is shown in **Figure 2** and the locations of the identified asbestos impacted fill material is shown in **Figure 3**.

The objective of this RAP is to outline the preferred remedial strategy for the site, both in the extent of remediation works required and validation sampling to be undertaken, to address identified asbestos in soil impacts at the site, and to make these areas of the site suitable for the proposed land use (as shown on the plans included in **Appendix A**) without restriction or ongoing management requirements.

The proposed remediation and/or management strategy for the site comprises:

- Remediation of the identified hotspots of asbestos impacted fill material present on the site (as shown in **Figure 3**) via on-site containment of the asbestos impacted fill material beneath basement hardstand within on-site building footprints and roads/hardstand areas;
- Implementation of management practices during the remedial works to minimise the potential risks to on-site workers, vicinity third parties and the environment;
- Validation of material to be retained in deep soil zones on-site (if any) to confirm that these exposed soil areas are suitable for the proposed land uses;
- Validation of soils to be retained on site following excavation of overlying fill material (if any) to confirm that these soil areas are suitable for the proposed land uses;
- In the event of the discovery of previously unidentified soil impacts (i.e. unexpected finds) during site redevelopment works, additional validation and/or remediation of the soil may be necessary. If required, the validation soil sample results will be compared to the guideline criteria applicable to the proposed land use within that stage;
- If significant unexpected soil impacts are encountered during soil remedial works, validation of the groundwater beneath the site may become necessary. However based on the data collected to date, remediation of groundwater at the site is not considered to be necessary;
- In the event that imported fill material is needed to backfill any excavations (i.e., for service trenches), only material certified as comprising VENM should be imported onto the site. It is noted, however, that based on the proposed redevelopment incorporating significant below ground car parking, it is considered unlikely that any fill material will need to be imported to the site other than materials for landscaping purposes; and
- Following completion of the proposed remedial/management strategy, Validation Report/s will be prepared for the site.

It is noted that this RAP has been prepared based on current proposed development plans (provided in **Appendix A**). Should the design plans be modified to include more sensitive land uses than outlined in this

report (such as childcare centres, preschools), this RAP should be revised to include appropriate validation sampling requirements and criteria for these areas of the site.

It is considered that the site will be made suitable for the proposed medium to high-density residential, aged care and communal/recreational open space land uses following successful implementation of the above remediation/management strategy for the site. The Validation Report will detail the methods and results of the site remedial activities and demonstrate that the site was remediated to a condition suitable for the proposed land uses.

13 References

- 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.
- EIS (2015), *Report to Blacktown Workers Sports Club C/- Paynter Dixon Constructions Pty Ltd on Stage 1 Environmental Site Assessment for Site A: Proposed Out Door Sports Facilities – 221 Walters Road, Arndell Park. Site B: Residential Age Care Facility and Childcare Centre – 170 Reservoir Road, Arndell Park, at Blacktown Workers Sports Club, Off Reservoir Road, Arndell Park, NSW*, Dated 19 February 2015.
- Geological Survey of NSW 1:100,000 Penrith Geological Series Sheet 9030 (Edition 1) (1991).
- NEPC (2013), National Environment Protection (*Assessment of Site Contamination*) Measure (NEPM). National Environment Protection Council (NEPC) 1999, Amendment 2013.
- National Health and Medical Research Council (2018) *Australian Drinking Water Guidelines*, Updated August 2018;
- NSW Department of Urban Affairs and Planning (1998), *Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land*, 1998.
- NSW EPA (1995), *Contaminated Sites Sampling Design Guidelines*. NSW EPA, September 1995.
- NSW EPA (2014), *Waste Classification Guidelines. Part 1: Classifying Waste*. NSW EPA, November 2014.
- NSW EPA (2015), *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act*. NSW EPA, September 2015.
- NSW EPA (2017), *Contaminated Sites Guidelines for the NSW Site Auditor Scheme (3rd Edition)*. NSW EPA, October 2017;
- NSW OEH (2011), *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.* NSW Office of Environment & Heritage (OEH), November 1997, Reprinted September 2000 and August 2011.
- SafeWork NSW *Code of Practice: How to Manage and Control Asbestos in the Workplace* (2016).
- SafeWork NSW *Code of Practice: How to Safely Remove Asbestos* (2016).
- Standards Australia (2005), Australian Standard AS 4482.1-2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*. Standards Australia, Homebush, NSW.
- Standards Australia (1999), Australian Standard AS 4482.2-1999 - *Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances*. Standards Australia.
- TRACE Environmental (2018) *Detailed Site Investigation, 170 Reservoir Road, Arndell Park, NSW,* Dated 10 December 2018.

14 Limitations

This report has been prepared for Paynter Dixon Constructions 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.

This report and the information contained in it is the intellectual property of TRACE Environmental. Paynter Dixon Constructions Pty Ltd is granted an exclusive licence for the use of the report for the purpose described in the report.

Figures

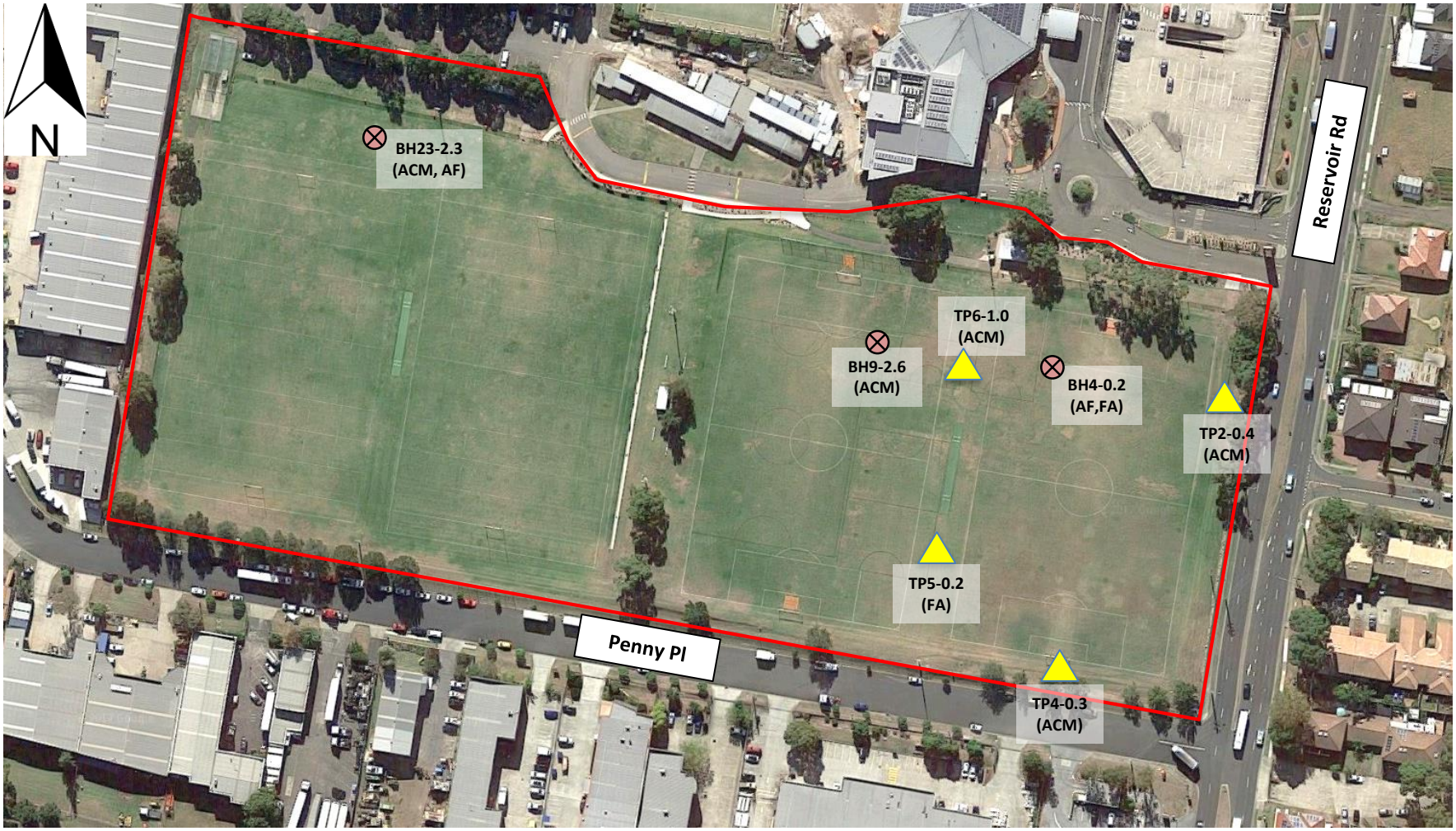
Source: Google Maps

TRACE ENVIRONMENTAL	Project: **28.01**	Title:	**Site Locality Plan**
	Figure: **1**	Address:	**170 Reservoir Road, Arndell Park, NSW**

Investigation Area Boundary

Source: Google

TRACE ENVIRONMENTAL	Project: **28.01**	Title:	**Site Plan**
	Figure: **2**	Address:	**170 Reservoir Road, Arndell Park, NSW**



Investigation Area Boundary

Borehole Location

Test Pit Location

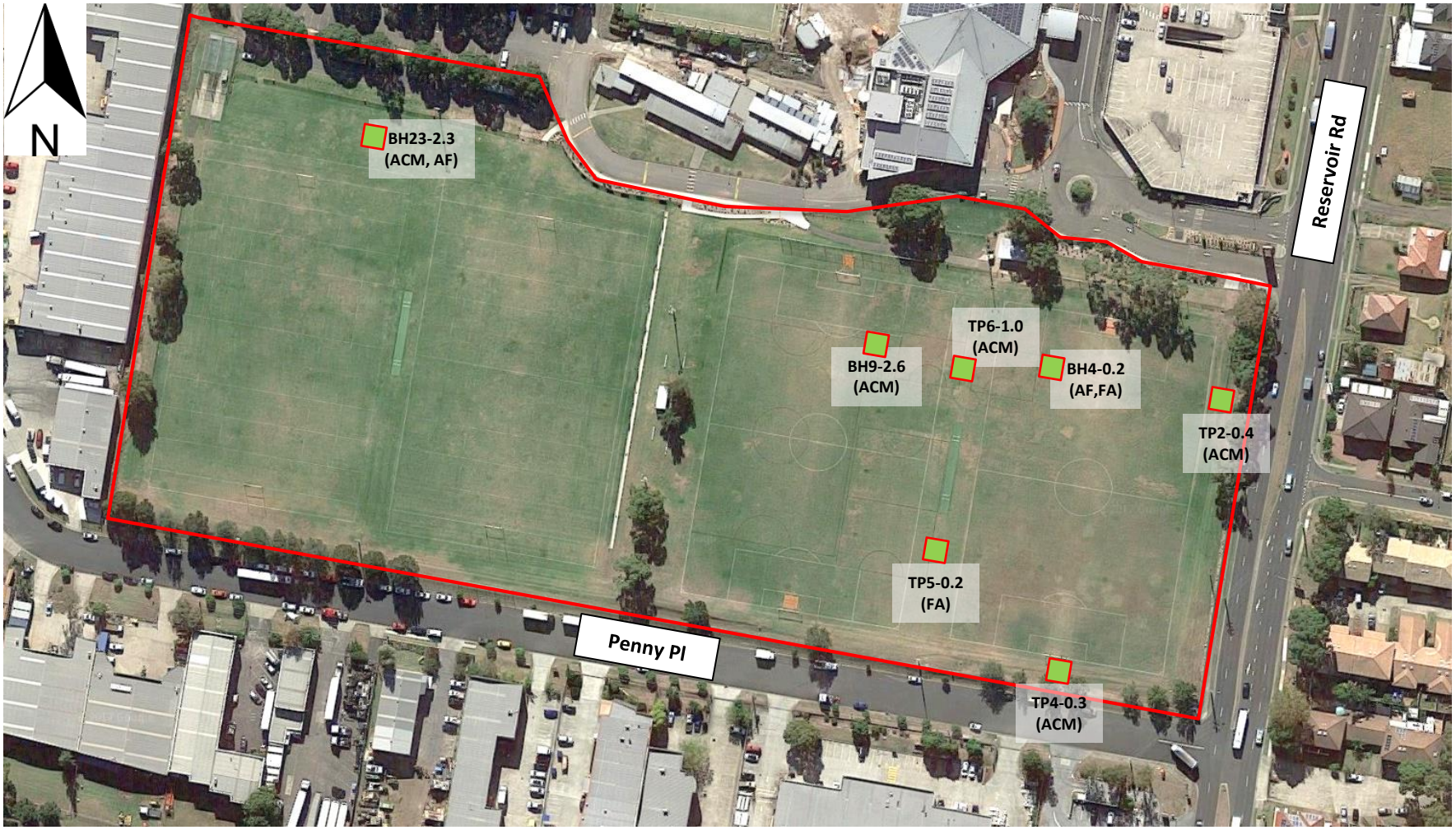
AF = Asbestos Fines

FA = Friable Asbestos

ACM = Asbestos Containing Material

Source: Google

TRACE ENVIRONMENTAL	Project: **28.01**	Title:	**Identified Asbestos Impacted Fill Material**
	Figure: **3**	Address:	**170 Reservoir Road, Arndell Park, NSW**



Investigation Area Boundary

10x10m remediation hotspot

AF = Asbestos Fines

FA = Friable Asbestos

ACM = Asbestos Containing Material

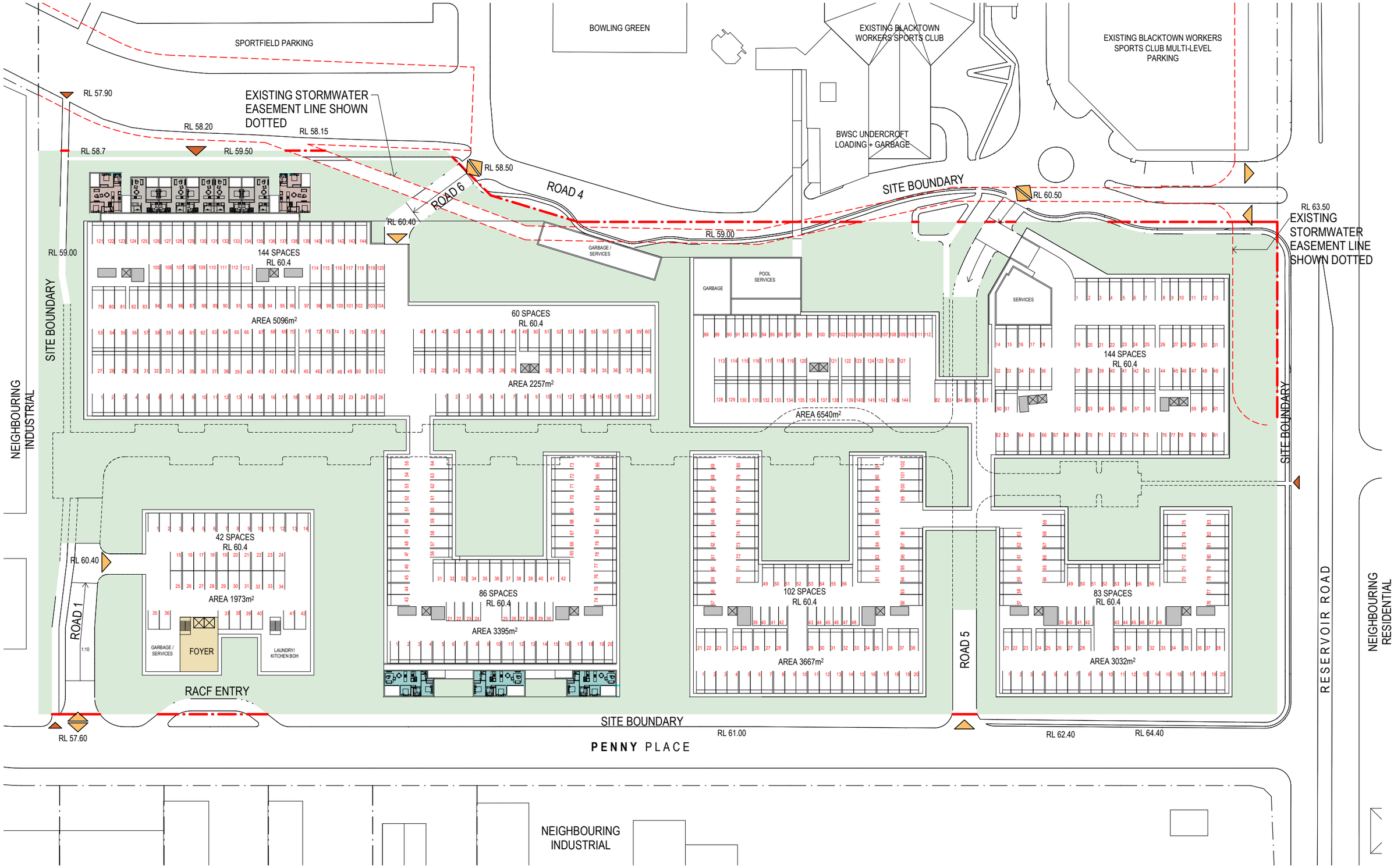
20 m (approx.)

Source: Google

TRACE ENVIRONMENTAL	Project: **28.01**	Title:	**10x10m Remediation Hotspot Indicative Boundaries**
	Figure: **4**	Address:	**170 Reservoir Road, Arndell Park, NSW**

Appendix A

Proposed Development Plans



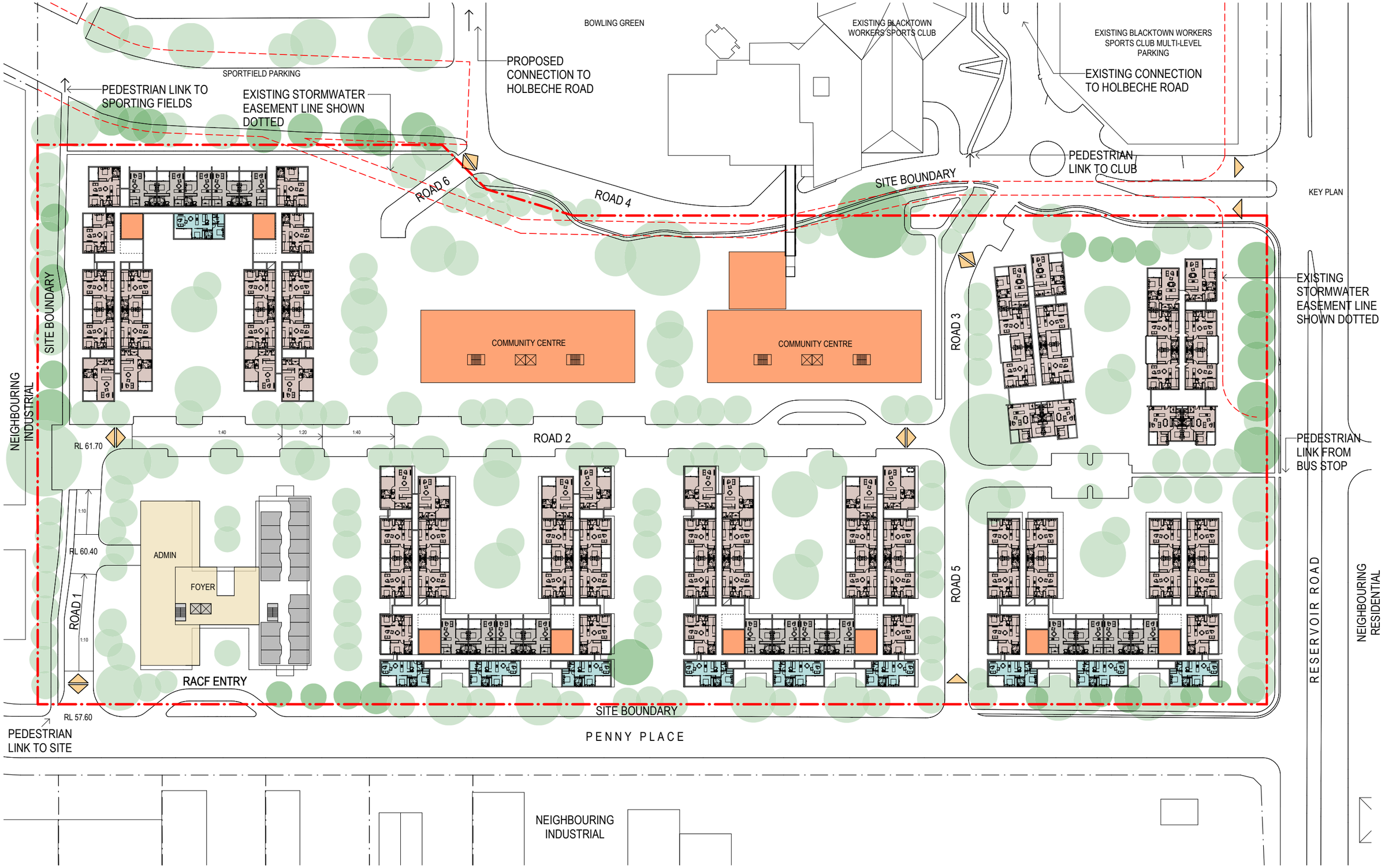
0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 1000 - Basement Plan

AJ+C Allen Jack+Cottier



0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 1001 - Ground Floor Plan

AJ+C ALLEN JACK+COTTIER

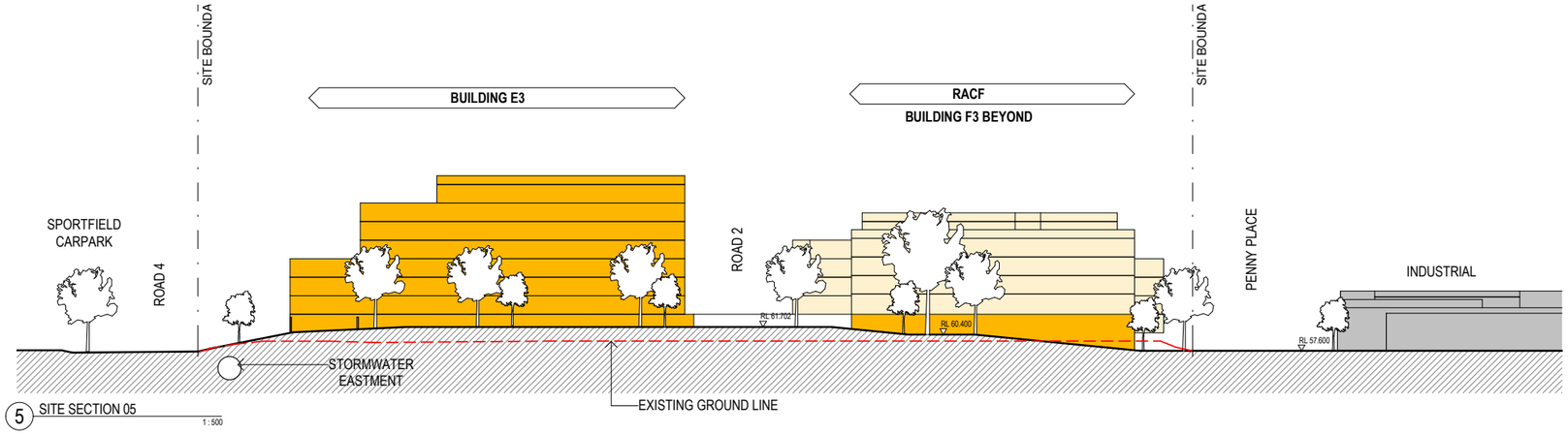
0 1 2 4 8 m

N

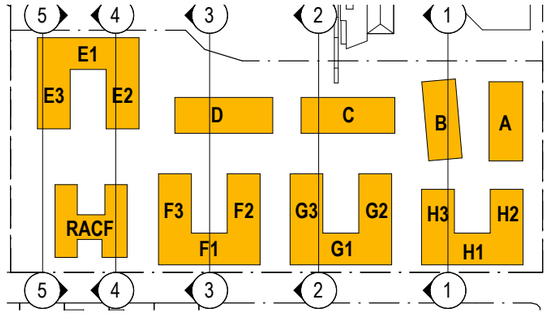
17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

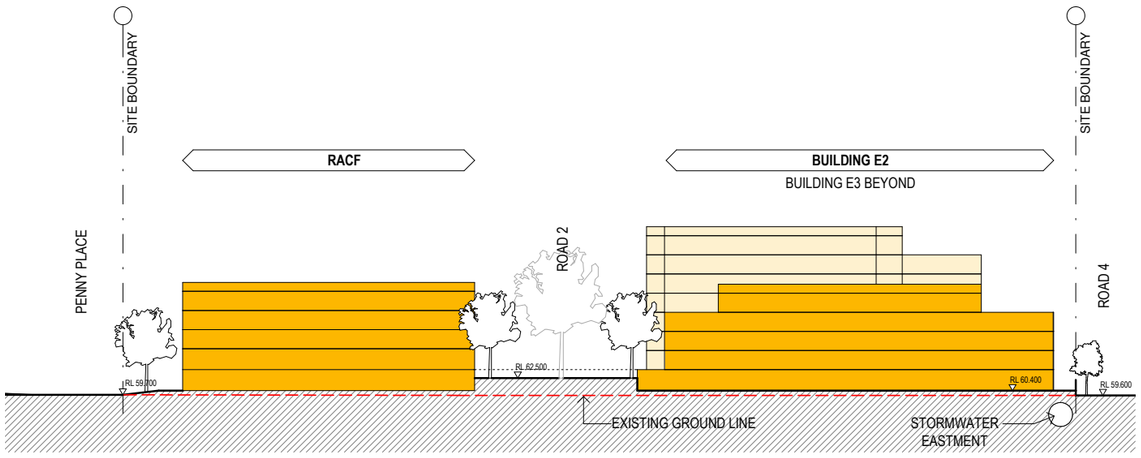
SCC 1003 - Roof Plan

AJ+C Allen Jack+Cottier

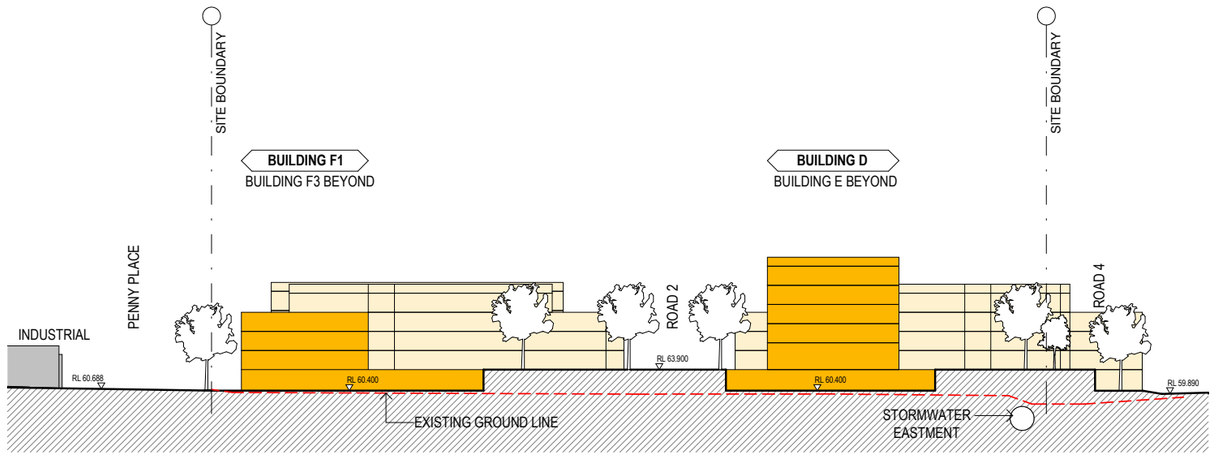


5 SITE SECTION 05
1 : 500

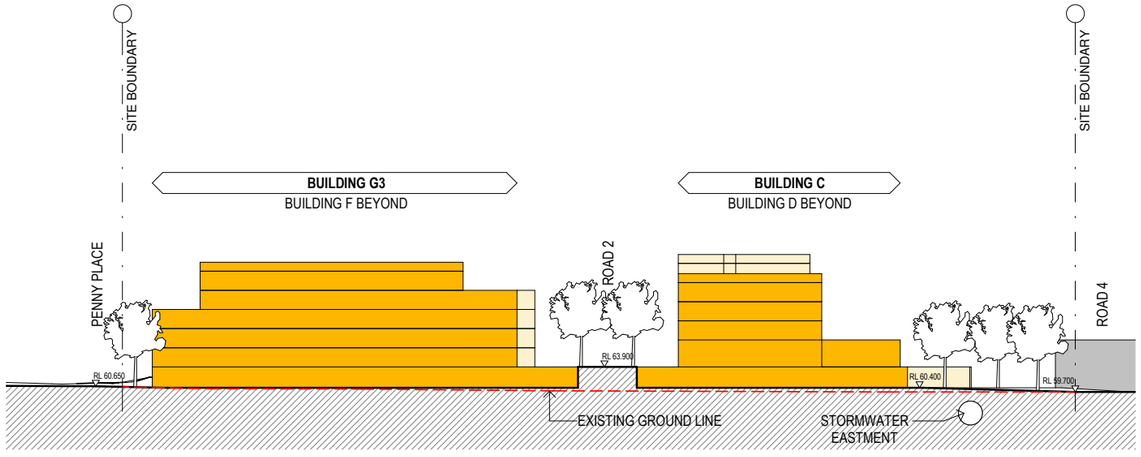




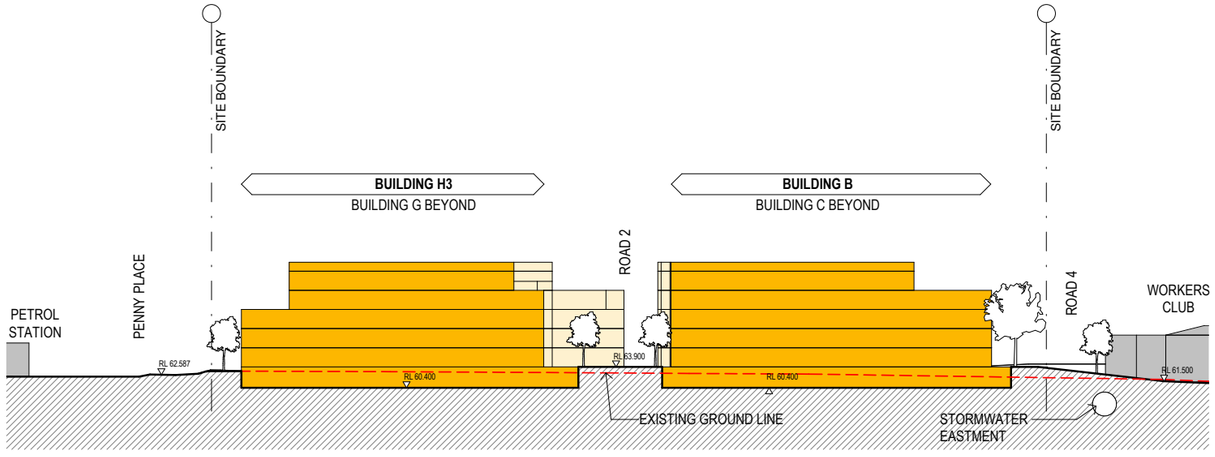
4 SITE SECTION 04
1 : 500



3 SITE SECTION 03
1 : 500



2 SITE SECTION 02
1 : 500



1 SITE SECTION 01
1 : 500

A

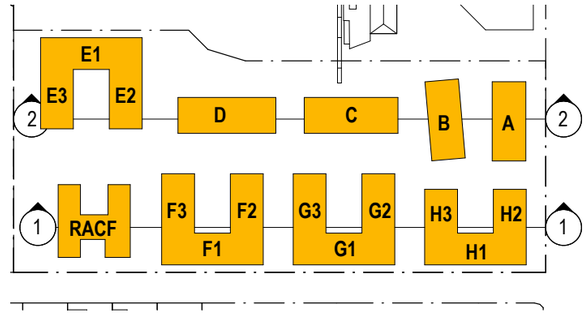
0 1 2 4 8 m

N

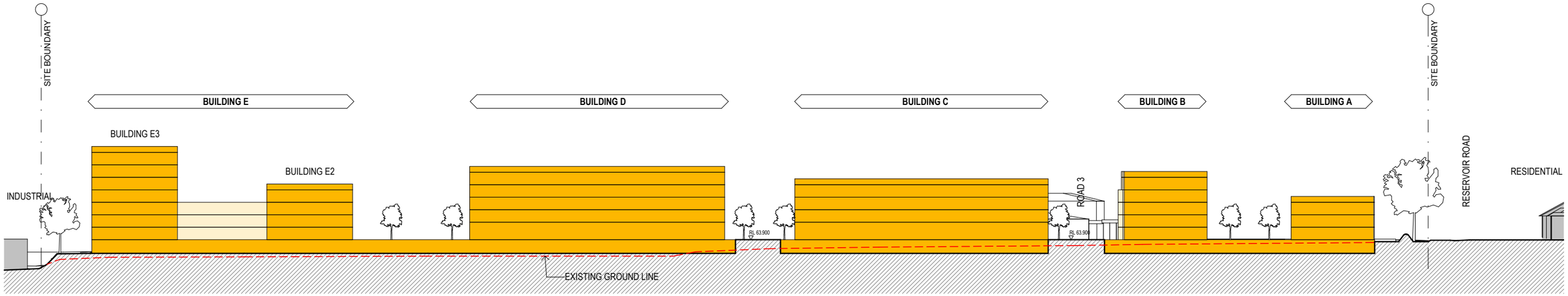
17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 2000 - SECTIONS

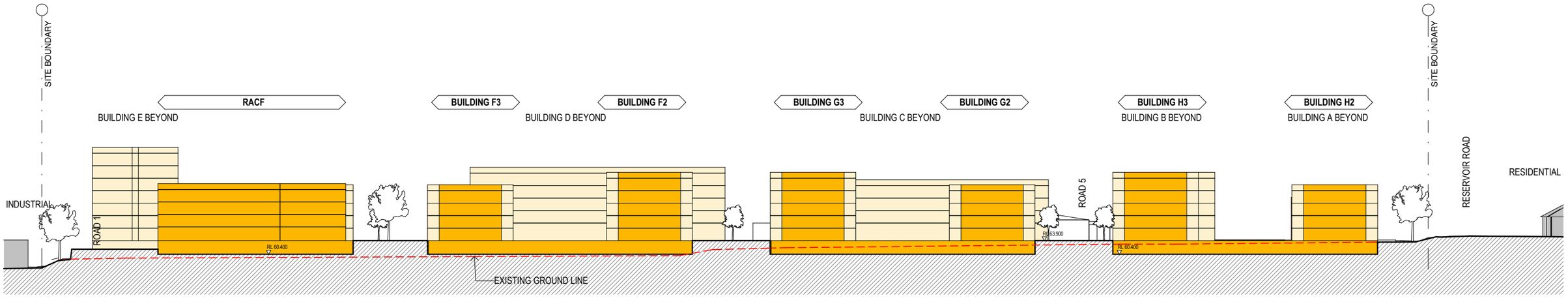
AJ+C ALLEN JACK+COTTIER



KEY PLAN



2 SITE SECTION 02
1 : 500



1 SITE SECTION 01
1 : 500

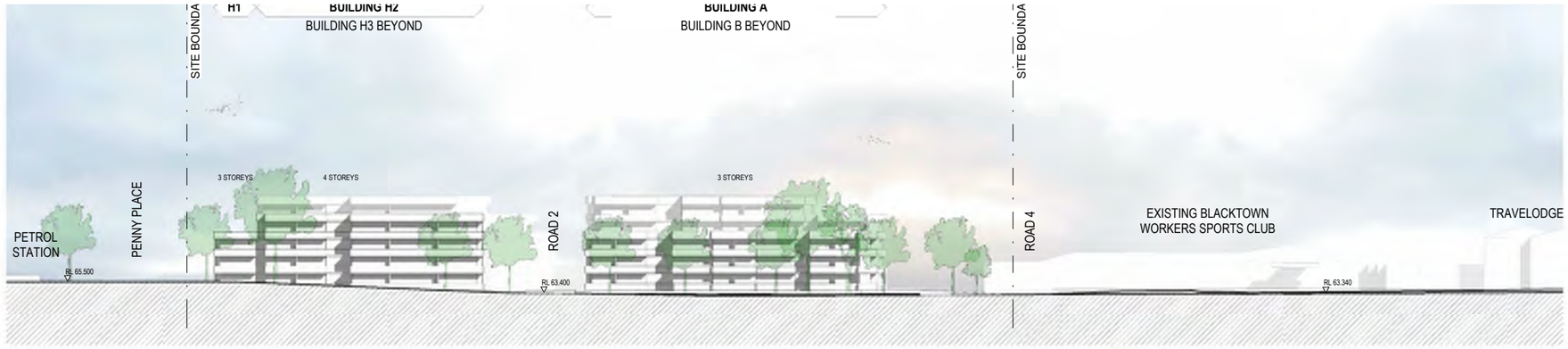
0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

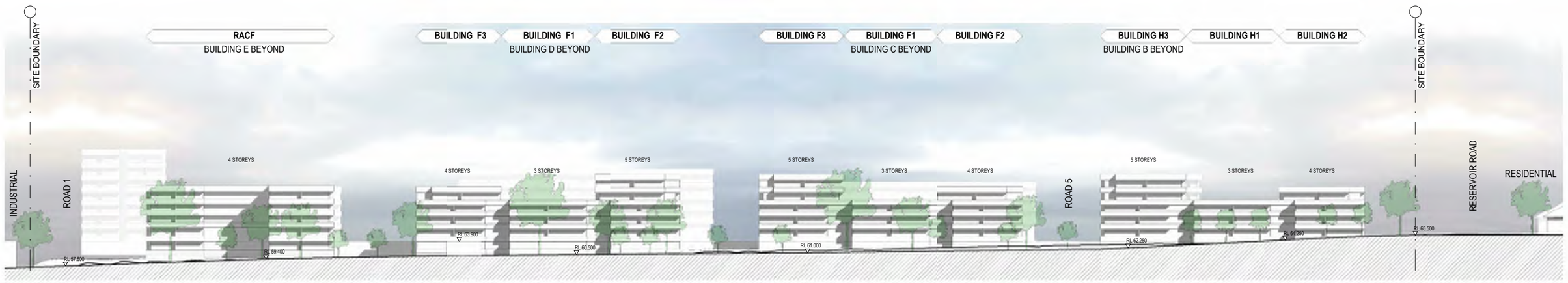
SCC 2001 - ENVELOPES SECTIONS

AJ+C ALLEN JACK+COTTIER



3 SITE ELEVATION EAST (RESERVOIR ROAD)
1 : 500

KEY PLAN



2 SITE ELEVATION SOUTH (PENNY PLACE)
1 : 500

1 SITE ELEVATION NORTH
1 : 500

0 1 2 4 8 m

N

17002 BLACKTOWN WORKERS SENIORS LIVING - Site Compatibility Certificate

SCC 2010 - ENVELOPES ELEVATIONS

AJ+C ALLEN JACK+COTTIER

Appendix B

EIS (2015) Stage 1 ESA

Borehole and Test Pit Logs, Figures, Tables

EIS

TABLE CB - SITE B RESIDENTIAL DEVELOPMENT
SOIL LABORATORY RESULTS COMPARED TO HIL-B
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 [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	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) [1]			500	150	500	30000	1200	120	1200	60000	400	4	15	400	500	10	90	600	10	340	1	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
BH212	0-0.2	FILL: Sandy Silt	7	LPQL	11	18	20	LPQL	9	89	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH212	1.0-1.2	FILL: Silty Clay	7	LPQL	16	38	20	LPQL	29	85	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH212	1.0-1.2	FILL: Silty Clay	6	LPQL	16	39	20	LPQL	31	89	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH212	2.0-2.2	FILL: Silty Clay	8	LPQL	14	39	13	LPQL	20	93	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH213	0-0.3	FILL: Sandy Silt	7	LPQL	13	19	20	LPQL	11	83	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH213	1.0-1.2	FILL: Silty Clay	13	LPQL	10	38	13	LPQL	22	80	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH213	2.0-2.2	FILL: Silty Clay	5	LPQL	13	17	14	LPQL	8	25	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH214	0-0.4	FILL: Silty Clay	6	LPQL	19	110	26	LPQL	10	94	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH214	1.0-1.3	FILL: Silty Clay	13	LPQL	12	37	18	LPQL	17	84	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH215	0-0.2	FILL: Sandy Silt	8	LPQL	11	24	24	LPQL	13	86	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH215	1.0-1.2	FILL: Sandy Silt	10	LPQL	13	39	16	LPQL	25	79	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH215	1.0-1.2	FILL: Sandy Silt	11	LPQL	12	41	16	LPQL	24	81	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH215	2.0-2.2	FILL: Silty Clay	6	LPQL	10	16	10	LPQL	3	19	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH215	2.8-3.0	FILL: Silty Clay	12	LPQL	18	19	13	LPQL	9	28	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH216	0-0.2	FILL: Sandy Silt	4	LPQL	10	12	16	LPQL	6	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH216	1.0-1.3	FILL: Silty Clay	5	LPQL	18	14	14	LPQL	9	22	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH217	0-0.3	FILL: Sandy Silt	10	LPQL	23	17	30	LPQL	9	36	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH217	0.9-1.2	FILL: Silty Clay	8	LPQL	22	17	16	LPQL	10	26	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH218	0-0.3	FILL: Sandy Silt	11	LPQL	9	46	18	LPQL	25	98	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH218	0.9-1.2	FILL: Silty Clay	9	LPQL	20	21	17	LPQL	9	33	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH218	1.8-2.1	FILL: Silty Clay	6	LPQL	19	20	12	LPQL	11	34	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH219	0-0.2	FILL: Sandy Silt	LPQL	LPQL	8	11	12	LPQL	5	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH219	0-0.2	FILL: Sandy Silt	LPQL	LPQL	9	11	12	LPQL	5	37	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP220	0-0.1	FILL: Sandy Silt	4	LPQL	11	13	26	LPQL	7	56	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP220	0.4-0.5	FILL: Sility Clay	5	LPQL	12	15	12	LPQL	4	18	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP220	1.5-1.7	FILL: Silty Clay	10	LPQL	26	12	21	LPQL	6	19	LPQL	LPQL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TP228	0.1-0.2	FILL: Sandy Silt	11	LPQL	19	23	22	LPQL	15	67	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP229	0-0.1	FILL: Sandy Silt	7	LPQL	13	15	20	LPQL	9	53	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
Total Number of Samples			28	28	28	28	28	28	28	28	28	28	12	12	12	12	12	12	12	12	12	11
Maximum Value			13	LPQL	26	110	30	LPQL	31	98	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-B: 'Residential with minimal opportunities for soil access; including dwellings with fully/permanently paved yards like high-rise buildings'

2 - The results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.

3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
OPP: Organophosphorus Pesticides
OCP: Organochlorine Pesticides
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
HILs: Health Investigation Levels
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure

TABLE CD1 - SITE A & SITE 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	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					RESIDENTIAL WITH ACCESSIBLE SOIL							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH201	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH201	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH202	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH203	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH204	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH205	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH206	0.2-0.4	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH206	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH207	0.2-0.4	FILL: Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH207	1.2-1.4	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH207	2.8-3.0	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH208	0.2-0.4	FILL: Gravelly Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH208	0.2-0.4	FILL: Gravelly Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH208	1.6-2.0	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH208	3.6-4.0	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH209	0.1-0.2	FILL: Silty Sand	0m to < 1m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH209	1.0-1.2	FILL: Silty Sand	1m to <2m	Sand	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH209	3.6-3.8	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH210	0.1-0.4	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH210	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH210	1.9-2.1	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH211	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH211	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH212	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH212	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH212	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH212	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH213	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH213	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH213	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH214	0-0.4	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH214	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH215	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH215	1.0-1.2	FILL: Sandy Silt	1m to <2m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH215	1.0-1.2	FILL: Sandy Silt	1m to <2m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH215	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH215	2.8-3.0	FILL: Silty Clay	2m to <4m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					37	37	37	37	37	37	37	37
Maximum Value					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:
UCL: Upper Level Confidence Limit on Mean Value
HSLs: Health Screening Levels
NA: Not Analysed
NC: Not Calculated
NL: Not Limiting
SAC: Site Assessment Criteria
PQL: Practical Quantitation Limit
LPQL: Less than PQL
NEPM: National Environmental Protection Measure

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	3	1
HSL Land Use Category [1]					RESIDENTIAL WITH ACCESSIBLE SOIL						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH201	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH201	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH202	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH203	0.1-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH204	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH205	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH206	0.2-0.4	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH206	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH207	0.2-0.4	FILL: Silty Sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH207	1.2-1.4	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH207	2.8-3.0	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH208	0.2-0.4	FILL: Gravelly Silty Sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH208	0.2-0.4	FILL: Gravelly Silty Sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH208	1.6-2.0	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH208	3.6-4.0	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH209	0.1-0.2	FILL: Silty Sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3
BH209	1.0-1.2	FILL: Silty Sand	1m to <2m	Sand	70	240	0.5	220	NL	60	NL
BH209	3.6-3.8	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH210	0.1-0.4	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH210	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH210	1.9-2.1	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH211	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH211	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH212	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH212	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH212	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH212	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH213	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH213	1.0-1.2	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH213	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH214	0-0.4	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH214	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH215	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH215	1.0-1.2	FILL: Sandy Silt	1m to <2m	Silt	65	NL	0.7	NL	NL	210	NL
BH215	1.0-1.2	FILL: Sandy Silt	1m to <2m	Silt	65	NL	0.7	NL	NL	210	NL
BH215	2.0-2.2	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL
BH215	2.8-3.0	FILL: Silty Clay	2m to <4m	Clay	150	NL	2	NL	NL	NL	NL

TABLE CD1 - SITE A & SITE 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	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					RESIDENTIAL WITH ACCESSIBLE SOIL							
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category								
BH216	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH216	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH217	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH217	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH218	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH218	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH218	1.8-2.1	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH219	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH219	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP220	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP220	0.4-0.5	FILL: Sility Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP220	1.5-1.7	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP221	0.1-0.2	FILL: Sility Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP222	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP223	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP224	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP225	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP225	0.7-0.8	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP225	1.1-1.3	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP225	1.1-1.3	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP226	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP226	0.4-0.5	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP226	1.3-1.5	FILL: Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP227	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP228	0.1-0.2	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
TP229	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					26	26	26	26	26	26	26	26
Maximum Value					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:

UCL: Upper Level Confidence Limit on Mean Value	NC: Not Calculated	PQL: Practical Quantitation Limit
HSLs: Health Screening Levels	NL: Not Limiting	LPQL: Less than PQL
NA: Not Analysed	SAC: Site Assessment Criteria	NEPM: National Environmental Protection Measure

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	3	1
HSL Land Use Category [1]					RESIDENTIAL WITH ACCESSIBLE SOIL						
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category							
BH216	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH216	1.0-1.3	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH217	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH217	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH218	0-0.3	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH218	0.9-1.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH218	1.8-2.1	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
BH219	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
BH219	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
TP220	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
TP220	0.4-0.5	FILL: Sility Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP220	1.5-1.7	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
TP221	0.1-0.2	FILL: Sility Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP222	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP223	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP224	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP225	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP225	0.7-0.8	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
TP225	1.1-1.3	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
TP225	1.1-1.3	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
TP226	0-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
TP226	0.4-0.5	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP226	1.3-1.5	FILL: Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL
TP227	0-0.2	FILL: Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
TP228	0.1-0.2	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4
TP229	0-0.1	FILL: Sandy Silt	0m to < 1m	Silt	40	230	0.6	390	NL	95	4

EIS

TABLE C1 - SITES A & B
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES (2014)
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chlorpyrifos	Total Moderately Harmful [2]	Total Scheduled [3]		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 [1]			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 [1]			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 [1]			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 [1]			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**																									
BH201	0.1-0.2	FILL: Silty Clay	6	LPQL	18	20	17	LPQL	5	25	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH201	0.1-0.2	FILL: Silty Clay	6	LPQL	17	25	16	LPQL	4	26	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH202	0.1-0.2	FILL: Silty Clay	11	LPQL	25	11	17	LPQL	3	14	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH203	0.1-0.2	FILL: Silty Clay	18	0.5	20	30	92	LPQL	16	400	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH204	0-0.1	FILL: Sandy Silt	6	LPQL	14	13	29	LPQL	6	59	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH205	0-0.2	FILL: Silty Clay	6	LPQL	13	20	28	LPQL	10	58	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH206	0.2-0.4	FILL: Silty Clay	6	0.5	16	29	24	LPQL	8	99	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	NA
BH206	2.0-2.2	FILL: Silty Clay	LPQL	LPQL	15	31	13	LPQL	13	46	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH207	0.2-0.4	FILL: Silty Sand	5	LPQL	16	31	14	LPQL	29	46	1.5	0.1	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH207	1.2-1.4	FILL: Silty Clay	9	LPQL	20	23	18	LPQL	12	52	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH207	2.8-3.0	FILL: Silty Clay	9	LPQL	19	37	21	LPQL	21	64	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	160	160	LPQL	LPQL	LPQL	LPQL	NA
BH208	0.2-0.4	FILL: Gravelly Silty Sand	35	LPQL	15	41	19	LPQL	21	71	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH208	0.2-0.4	FILL: Gravelly Silty Sand	41	LPQL	13	38	21	LPQL	21	67	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH208	1.6-2.0	FILL: Silty Clay	9	LPQL	19	39	26	LPQL	21	62	8.1	0.6	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH208	3.6-4.0	FILL: Silty Clay	9	LPQL	18	21	25	LPQL	10	29	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH209	0.1-0.2	FILL: Silty Sand	9	LPQL	13	40	15	LPQL	19	69	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH209	1.0-1.2	FILL: Silty Sand	20	LPQL	8	52	16	LPQL	22	81	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH209	3.6-3.8	FILL: Silty Clay	8	LPQL	18	18	22	LPQL	8	20	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH210	0.1-0.4	FILL: Silty Clay	6	LPQL	14	26	13	LPQL	14	38	0.07	0.07	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH210	1.0-1.3	FILL: Silty Clay	18	LPQL	10	42	13	LPQL	26	69	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH210	1.9-2.1	FILL: Silty Clay	17	LPQL	8	42	15	LPQL	20	70	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH211	0-0.2	FILL: Silty Clay	8	LPQL	17	25	31	LPQL	12	69	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH211	0.9-1.2	FILL: Silty Clay	12	LPQL	14	30	15	LPQL	33	61	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH212	0-0.2	FILL: Sandy Silt	7	LPQL	11	18	20	LPQL	9	89	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH212	1.0-1.2	FILL: Silty Clay	7	LPQL	16	38	20	LPQL	29	85	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH212	1.0-1.2	FILL: Silty Clay	6	LPQL	16	39	20	LPQL	31	89	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH212	2.0-2.2	FILL: Silty Clay	8	LPQL	14	39	13	LPQL	20	93	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH213	0-0.3	FILL: Sandy Silt	7	LPQL	13	19	20	LPQL	11	83	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH213	1.0-1.2	FILL: Silty Clay	13	LPQL	10	38	13	LPQL	22	80	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH213	2.0-2.2	FILL: Silty Clay	5	LPQL	13	17	14	LPQL	8	25	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH214	0-0.4	FILL: Silty Clay	6	LPQL	19	110	26	LPQL	10	94	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH214	1.0-1.3	FILL: Silty Clay	13	LPQL	12	37	18	LPQL	17	84	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH215	0-0.2	FILL: Sandy Silt	8	LPQL	11	24	24	LPQL	13	86	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH215	1.0-1.2	FILL: Sandy Silt	10	LPQL	13	39	16	LPQL	25	79	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH215	1.0-1.2	FILL: Sandy Silt	11	LPQL	12	41	16	LPQL	24	81	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH215	2.0-2.2	FILL: Silty Clay	6	LPQL	10	16	10	LPQL	3	19	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH215	2.8-3.0	FILL: Silty Clay	12	LPQL	18	19	13	LPQL	9	28	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH216	0-0.2	FILL: Sandy Silt	4	LPQL	10	12	16	LPQL	6	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH216	1.0-1.3	FILL: Silty Clay	5	LPQL	18	14	14	LPQL	9	22	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH217	0-0.3	FILL: Sandy Silt	10	LPQL	23	17	30	LPQL	9	36	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH217	0.9-1.2	FILL: Silty Clay	8	LPQL	22	17	16	LPQL	10	26	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH218	0-0.3	FILL: Sandy Silt	11	LPQL	9	46	18	LPQL	25	98	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH218	0.9-1.2	FILL: Silty Clay	9	LPQL	20	21	17	LPQL	9	33	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH218	1.8-2.1	FILL: Silty Clay	6	LPQL	19	20	12	LPQL	11	34	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH219	0-0.2	FILL: Sandy Silt	LPQL	LPQL	8	11	12	LPQL	5	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
BH219	0-0.2	FILL: Sandy Silt	LPQL	LPQL	9	11	12	LPQL	5	37	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP220	0-0.1	FILL: Sandy Silt	4	LPQL	11	13	26	LPQL	7	56	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP220	0.4-0.5	FILL: Silty Clay	5	LPQL	12	15	12	LPQL	4	18	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP220	1.5-1.7	FILL: Silty Clay	10	LPQL	26	12	21	LPQL	6	19	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP221	0.1-0.2	FILL: Silty Clay	11	LPQL	22	11	25	LPQL	4	27	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP222	0-0.2	FILL: Silty Clay	13	LPQL	19	23	39	LPQL	10	89	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP223	0-0.2	FILL: Silty Clay	10	LPQL	19	18	36	LPQL	8	60	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP224	0-0.2	FILL: Silty Clay	5	LPQL	15	13	19	LPQL	6	25	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP225	0-0.2	FILL: Silty Clay	10	LPQL	17	29	48	LPQL	17	91	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP225	0.7-0.8	FILL: Sandy Silt	6	LPQL	14	36	23	LPQL	20	67	2.9	0.3	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP225	1.1-1.3	FILL: Silty Clay	5	LPQL	14	33	28	LPQL	22	77	0.25	0.05	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP225	1.1-1.3	FILL: Silty Clay	6	LPQL	15	33	22	LPQL	19	60	0.06	0.06	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP226	0-0.2	FILL: Sandy Silt	LPQL	LPQL	9	15	29	0.1	6	76	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	110	600	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP226	0.4-0.5	FILL: Silty Clay	6	LPQL	19	30	29	0.3	22	68	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP226	1.3-1.5	FILL: Silty Clay	7	LPQL	12	16	10	LPQL	5	24	LPQL	LPQL	NA	NA	NA	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
TP227	0-0.2	FILL: Silty Clay	5	LPQL	13	20	35	LPQL	10	160	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP228	0.1-0.2	FILL: Sandy Silt	11	LPQL	19	23	22	LPQL	15	67	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
TP229	0-0.1	FILL: Sandy Silt	7	LPQL	13	15	20	LPQL	9	53	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No asbestos detected
FTP226	0.2	Fibre Cement Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Asbestos Detected
FTP227	0.1	Fibre Cement Fragment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Asbestos Detected
Total Number of samples			63	63	63	63	63	63	63	63	63	63	32	32	32	32	32	63	63	63	63	63	63	63	63	63	31
Maximum Value			41	0.5	26	110	92	0.3	33	400	8.1	0.6	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	110	600	LPQL	LPQL	LPQL	LPQL	NC

Explanation:
[1] - NSW EPA Waste Classification Guidelines (2014)
[2] - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion
[3] - Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde
[4] - Statistical calculation undertaken using ProUCL version 5.0 (USEPA). Statistical calculation has only been undertaken on fill samples

Concentration above the CT1 — VALUE
Concentration above SCC1 — VALUE
Concentration above the SCC2 — VALUE

Abbreviations:
PAHs: Polycyclic Aromatic Hydrocarbons
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
LPQL: Less than PQL
PID: Photoionisation Detector
PCBs: Polychlorinated Biphenyls
UCL: Upper Level Confidence Limit on Mean Value
NA: Not Analysed
NC: Not Calculated
NSL: No Set Limit
SAC: Site Assessment Criteria
TRH: Total Recoverable Hydrocarbons
CT: Contaminant Threshold
SCC: Specific Contaminant Concentration
HILs: Health Investigation Levels
NEPM: National Environmental Protection Measure
BTEX: Monocyclic Aromatic Hydrocarbons

TABLE CF - SITE B RESIDENTIAL DEVELOPMENT
SOIL LABORATORY RESULTS COMPARED TO EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																		
							AGED HEAVY METALS-EILs						EILs						ESLs				
				pH [3]	CEC (cmol$_c$/kg) [3]	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) [2]				-	-	-	NSL	13	28	NSL	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH211	0-0.2	FILL: Silty Clay	Fine	6.4	16.5	NA	8	17	25	31	12	69	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH211	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	12	14	30	15	33	61	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH212	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	7	11	18	20	9	89	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH212	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	7	16	38	20	29	85	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH212	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	6	16	39	20	31	89	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH212	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	8	14	39	13	20	93	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH213	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	7	13	19	20	11	83	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH213	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	13	10	38	13	22	80	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH213	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	5	13	17	14	8	25	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH214	0-0.4	FILL: Silty Clay	Fine	6.4	16.5	NA	6	19	110	26	10	94	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH214	1.0-1.3	FILL: Silty Clay	Fine	6.4	16.5	NA	13	12	37	18	17	84	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH215	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	8	11	24	24	13	86	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH215	1.0-1.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	10	13	39	16	25	79	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH215	1.0-1.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	11	12	41	16	24	81	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH215	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	6	10	16	10	3	19	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH215	2.8-3.0	FILL: Silty Clay	Fine	6.4	16.5	NA	12	18	19	13	9	28	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH216	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	4	10	12	16	6	51	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH216	1.0-1.3	FILL: Silty Clay	Fine	6.4	16.5	NA	5	18	14	14	9	22	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH217	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	10	23	17	30	9	36	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH217	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	8	22	17	16	10	26	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH218	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	11	9	46	18	25	98	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH218	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	9	20	21	17	9	33	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH218	1.8-2.1	FILL: Silty Clay	Fine	6.4	16.5	NA	6	19	20	12	11	34	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH219	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	LPQL	8	11	12	5	35	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH219	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	LPQL	9	11	12	5	37	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
TP220	0-0.1	FILL: Sandy Silt	Fine	6.4	16.5	NA	4	11	13	26	7	56	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
TP220	0.4-0.5	FILL: Silty Clay	Fine	6.4	16.5	NA	5	12	15	12	4	18	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
TP220	1.5-1.7	FILL: Silty Clay	Fine	6.4	16.5	NA	10	26	12	21	6	19	LPQL	NA	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
TP228	0.1-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	11	19	23	22	15	67	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
TP229	0-0.1	FILL: Sandy Silt	Fine	6.4	16.5	NA	7	13	15	20	9	53	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of Samples							30	30	30	30	30	30	30	13	30	30	30	30	30	30	30	30	30
Maximum Value							13	26	110	31	33	98	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - ABC Values for selected metals has been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted)
3 - The average pH and CEC data for the top 2m soil profile was obtained from the salinity tables

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

Abbreviations:
EILs: Ecological Investigation Levels
B(a)P: Benzo(a)pyrene
PQL: Practical Quantitation Limit
UCL: Upper Level Confidence Limit on Mean Value
ESLs: Ecological Screening Levels
NA: Not Analysed
LPQL: Less than PQL
SAC: Site Assessment Criteria
NEPM: National Environmental Protection Measure
NC: Not Calculated
NSL: No Set Limit
ABC: Ambient Background Concentration

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
							AGED HEAVY METALS-EILs						EILs						ESLs				
				pH [3]	CEC (cmol$_c$/kg) [3]	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) [2]				-	-	-	NSL	13	28	NSL	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH211	0-0.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH211	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH212	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH212	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH212	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH212	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH213	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH213	1.0-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH213	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH214	0-0.4	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH214	1.0-1.3	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH215	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH215	1.0-1.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH215	1.0-1.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH215	2.0-2.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH215	2.8-3.0	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH216	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH216	1.0-1.3	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH217	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH217	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH218	0-0.3	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH218	0.9-1.2	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
BH218	1.8-2.1	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH219	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
BH219	0-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
TP220	0-0.1	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
TP220	0.4-0.5	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	--	180	120	1300	5600	60	105	125	45	0.7
TP220	1.5-1.7	FILL: Silty Clay	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
TP228	0.1-0.2	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7
TP229	0-0.1	FILL: Sandy Silt	Fine	6.4	16.5	NA	100	203	238	1100	275	712	710	180	180	120	1300	5600	60	105	125	45	0.7

TABLE SA
SUMMARY OF SOIL LABORATORY RESULTS - EC and ECe

Borehole Number & Sample Depth	Sample Description	EC (µS/cm)	ECe (dS/m)	Salinity Class[1]
BH201_0.5-0.95	Silty Clay	240	1.68	Non-saline
BH201_3.5-4.0	Shale	610	5.49	Moderately Saline
BH202_1.5-1.95	Silty Clay	1300	10.4	Very Saline
BH202_2.5-3.0	Shale	560	7.84	Moderately Saline
BH203_0.5-0.95	Silty Clay	320	2.56	Slightly Saline
BH203_1.5-1.95	Shale	210	1.89	Non-saline
BH204_1.5-1.95	Silty Clay	1700	14.45	Very Saline
BH204_7.0-7.5	Shale	1000	8	Very Saline
BH204_8.5-9.0	Shale	1700	13.6	Very Saline
BH205_0.5-0.95	Silty Clay	1900	15.2	Very Saline
BH205_3.0-3.45	Silty Clay	1100	9.35	Very Saline
BH206_1.5-1.95	Fill: Silty Clay	370	3.145	Slightly Saline
BH206_4.0-4.5	Shale	900	8.1	Very Saline
BH206_7.0-7.5	Shale	680	6.12	Moderately Saline
BH207_0.5-0.95	Fill: Silty Clay	470	3.76	Slightly Saline
BH207_3.0-3.45	Fill: Silty Clay	420	3.57	Slightly Saline
BH207_6.0-6.45	Silty Clay	480	4.08	Moderately Saline
BH207_10-10.5	Shale	650	5.2	Moderately Saline
BH208_0.5-0.95	Fill: Gravelly Silty Sand	1200	10.2	Very Saline
BH208_4.5-4.95	Fill: Silty Clay	540	3.78	Slightly Saline
BH209_0.5-0.95	Fill: Silty Sand	380	3.23	Slightly Saline
BH209_3.0-3.45	Fill: Silty Sand	310	4.34	Moderately Saline
BH209_7.0-7.5	Shale	530	4.24	Moderately Saline
BH210_0.5-0.95	Fill: Silty Clay	1200	10.8	Very Saline
BH210_3.0-3.45	Shale	320	2.56	Slightly Saline
BH211_0.5-0.95	Fill: Silty Clay	86	0.774	Non-saline
BH212_0.5-0.95	Fill: Silty Clay	270	1.62	Non-saline
BH212_3.0-3.45	Silty Clay	220	1.32	Non-saline
BH212_5.5-6.0	Shale	290	2.32	Slightly Saline
BH213_1.5-1.95	Fill: Silty Clay	590	4.72	Moderately Saline
BH213_4.0-4.3	Sandstone	220	1.98	Non-saline
BH214_0.5-0.95	Fill: Silty Clay	640	3.84	Slightly Saline
BH214_3.0-3.15	Shale	860	6.88	Moderately Saline
BH215_0.5-0.95	Fill: Sandy Silt	260	2.08	Slightly Saline
BH215_4.5-4.95	Silty Clay	740	4.44	Moderately Saline
BH215_5.5-6.0	Shale	710	5.68	Moderately Saline
BH215_8.0-8.3	Shale	570	4.56	Moderately Saline
BH216_0.5-0.95	Fill: Silty Clay	280	2.24	Slightly Saline
BH217_0.5-0.95	Fill: Silty Clay	180	1.53	Non-saline
BH217_1.5-1.95	Silty Clay	580	3.48	Slightly Saline
BH218_0.5-0.95	Fill: Silty Clay	1000	8.5	Very Saline
BH218_3.0-3.45	Silty Clay	850	5.1	Moderately Saline
BH219_0.5-0.95	Silty Clay	1900	11.4	Very Saline
BH219_2.5-3.0	Shale	880	7.04	Moderately Saline
TP220_0.4-0.5	Fill: Silty Clay	240	1.44	Non-saline
TP221_0.1-0.2	Fill: Silty Clay	63	0.567	Non-saline
TP221_0.9-1.0	Silty Clay	1100	6.6	Moderately Saline
TP222_0.1-0.2	Fill: Silty Clay	51	0.714	Non-saline
TP222_0.9-1.0	Sandstone	86	0.688	Non-saline
TP223_0.1-0.2	Fill: Silty Clay	110	0.88	Non-saline
TP224_0.0-0.2	Fill: Silty Clay	660	5.94	Moderately Saline
TP225_1.1-1.3	Fill: Silty Clay	1000	8.5	Very Saline
TP226_0.4-0.5	Fill: Silty Clay	160	1.44	Non-saline
TP227_0.3-0.5	Silty Clay	1900	13.3	Very Saline
TP228_0.1-0.2	Fill: Sandy Silt	150	1.5	Non-saline
TP228_0.9-1.0	Fill: Silty Sand	350	2.8	Slightly Saline
TP229_0.0-0.1	Fill: Sandy Silt	110	1.54	Non-saline
TP229_1.1-1.3	Fill: Silty Clay	1300	11.7	Very Saline
TP225_0.4-0.5	Fill: Sandy Silt	390	3.12	Slightly Saline
TP226_0.8-1.0	Fill: Silty Clay	220	1.32	Non-saline
				Non-saline
Total Number of Samples		60	60	-
Minimum Value		51	0.567	-
Maximum Value		1900	15.2	-

Explanation

1 - Salinity Class has been adopted from '*Site Investigations for Urban Salinity*' DLWC 2002.

ECe Values (dS/m)	Salinity Class
<2	Non-Saline
2 to 4	Slightly Saline
4 to 8	Moderately Saline
8 to 16	Very Saline
>16	Highly Saline

Abbreviations

EC - Electrical Conductivity
ECe - Extract Electrical Conductivity

TABLE SB
SUMMARY OF RESISTIVITY CALCULATION ON SOIL EC RESULTS

Borehole Number & Sample Depth	Sample Description	Resistivity[1] (ohm.cm)	Classification[2] Condition B
BH201_0.5-0.95	Silty Clay	4,200	Non-Aggressive
BH201_3.5-4.0	Shale	1,700	Mildly Aggressive
BH202_1.5-1.95	Silty Clay	770	Moderately Aggressive
BH202_2.5-3.0	Shale	1,800	Mildly Aggressive
BH203_0.5-0.95	Silty Clay	3,100	Non-Aggressive
BH203_1.5-1.95	Shale	4,800	Non-Aggressive
BH204_1.5-1.95	Silty Clay	570	Moderately Aggressive
BH204_7.0-7.5	Shale	970	Moderately Aggressive
BH204_8.5-9.0	Shale	600	Moderately Aggressive
BH205_0.5-0.95	Silty Clay	530	Moderately Aggressive
BH205_3.0-3.45	Silty Clay	910	Moderately Aggressive
BH206_1.5-1.95	Fill: Silty Clay	2,700	Non-Aggressive
BH206_4.0-4.5	Shale	1,100	Mildly Aggressive
BH206_7.0-7.5	Shale	1,500	Mildly Aggressive
BH207_0.5-0.95	Fill: Silty Clay	2,100	Non-Aggressive
BH207_3.0-3.45	Fill: Silty Clay	2,400	Non-Aggressive
BH207_6.0-6.45	Silty Clay	2,100	Non-Aggressive
BH207_10-10.5	Shale	1,500	Mildly Aggressive
BH208_0.5-0.95	Fill: Gravelly Silty Sand	820	Moderately Aggressive
BH208_4.5-4.95	Fill: Silty Clay	1,800	Mildly Aggressive
BH209_0.5-0.95	Fill: Silty Sand	2,600	Non-Aggressive
BH209_3.0-3.45	Fill: Silty Sand	3,300	Non-Aggressive
BH209_7.0-7.5	Shale	1,900	Mildly Aggressive
BH210_0.5-0.95	Fill: Silty Clay	820	Moderately Aggressive
BH210_3.0-3.45	Shale	3,100	Non-Aggressive
BH211_0.5-0.95	Fill: Silty Clay	12,000	Non-Aggressive
BH212_0.5-0.95	Fill: Silty Clay	3,700	Non-Aggressive
BH212_3.0-3.45	Silty Clay	4,500	Non-Aggressive
BH212_5.5-6.0	Shale	3,400	Non-Aggressive
BH213_1.5-1.95	Fill: Silty Clay	1,700	Mildly Aggressive
BH213_4.0-4.3	Sandstone	4,500	Non-Aggressive
BH214_0.5-0.95	Fill: Silty Clay	1,600	Mildly Aggressive
BH214_3.0-3.15	Shale	1,200	Mildly Aggressive
BH215_0.5-0.95	Fill: Sandy Silt	3,800	Non-Aggressive
BH215_4.5-4.95	Silty Clay	1,300	Mildly Aggressive
BH215_5.5-6.0	Shale	1,400	Mildly Aggressive
BH215_8.0-8.3	Shale	1,700	Mildly Aggressive
BH216_0.5-0.95	Fill: Silty Clay	3,600	Non-Aggressive
BH217_0.5-0.95	Fill: Silty Clay	5,600	Non-Aggressive
BH217_1.5-1.95	Silty Clay	1,700	Mildly Aggressive
BH218_0.5-0.95	Fill: Silty Clay	990	Moderately Aggressive
BH218_3.0-3.45	Silty Clay	1,200	Mildly Aggressive
BH219_0.5-0.95	Silty Clay	530	Moderately Aggressive
BH219_2.5-3.0	Shale	1,100	Mildly Aggressive
TP220_0.4-0.5	Fill: Silty Clay	4,100	Non-Aggressive
TP221_0.1-0.2	Fill: Silty Clay	16,000	Non-Aggressive
TP221_0.9-1.0	Silty Clay	940	Moderately Aggressive
TP222_0.1-0.2	Fill: Silty Clay	20,000	Non-Aggressive
TP222_0.9-1.0	Sandstone	12,000	Non-Aggressive
TP223_0.1-0.2	Fill: Silty Clay	9,000	Non-Aggressive
TP224_0.0-0.2	Fill: Silty Clay	1,500	Mildly Aggressive
TP225_1.1-1.3	Fill: Silty Clay	1,000	Moderately Aggressive
TP226_0.4-0.5	Fill: Silty Clay	6,100	Non-Aggressive
TP227_0.3-0.5	Silty Clay	520	Moderately Aggressive
TP228_0.1-0.2	Fill: Sandy Silt	6,500	Non-Aggressive
TP228_0.9-1.0	Fill: Silty Sand	2,900	Non-Aggressive
TP229_0.0-0.1	Fill: Sandy Silt	8,800	Non-Aggressive
TP229_1.1-1.3	Fill: Silty Clay	740	Moderately Aggressive
TP225_0.4-0.5	Fill: Sandy Silt	2,600	Non-Aggressive
TP226_0.8-1.0	Fill: Silty Clay	4,500	Non-Aggressive
Total Number of Samples		60	-
Minimum Value		520	-
Maximum Value		20,000	-

Explanation

1 - Resistivity values have been calculated on the laboratory EC values presented in Table B

2 - Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Table 6.5.2 [A] & [C])
Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Resistivity Values (ohm.cm)	Classification for Steel Piles
>5,000	Non-Aggressive
2,000 - 5,000	Non-Aggressive
1,000 - 2,000	Mildly Aggressive
<1,000	Moderately Aggressive

Abbreviations

EC - Electrical Conductivity

TABLE SC
SUMMARY OF SOIL LABORATORY RESULTS - pH

Borehole Number & Sample Depth	Sample Description	pH	Classification for Concrete Piles[1] Soil Condition B[2]	Classification for Steel Piles[1] Soil Condition B[2]
BH201_0.5-0.95	Silty Clay	4.3	Moderately Aggressive	Non-Aggressive
BH201_3.5-4.0	Shale	7.4	Non-Aggressive	Non-Aggressive
BH202_1.5-1.95	Silty Clay	4.6	Mildly Aggressive	Non-Aggressive
BH202_2.5-3.0	Shale	5	Mildly Aggressive	Non-Aggressive
BH203_0.5-0.95	Silty Clay	4.9	Mildly Aggressive	Non-Aggressive
BH203_1.5-1.95	Shale	7.3	Non-Aggressive	Non-Aggressive
BH204_1.5-1.95	Silty Clay	7.5	Non-Aggressive	Non-Aggressive
BH204_7.0-7.5	Shale	8.1	Non-Aggressive	Non-Aggressive
BH204_8.5-9.0	Shale	8.2	Non-Aggressive	Non-Aggressive
BH205_0.5-0.95	Silty Clay	7.5	Non-Aggressive	Non-Aggressive
BH205_3.0-3.45	Silty Clay	7.9	Non-Aggressive	Non-Aggressive
BH206_1.5-1.95	Fill: Silty Clay	5.5	Mildly Aggressive	Non-Aggressive
BH206_4.0-4.5	Shale	8.1	Non-Aggressive	Non-Aggressive
BH206_7.0-7.5	Shale	8.6	Non-Aggressive	Non-Aggressive
BH207_0.5-0.95	Fill: Silty Clay	5.1	Mildly Aggressive	Non-Aggressive
BH207_3.0-3.45	Fill: Silty Clay	7	Non-Aggressive	Non-Aggressive
BH207_6.0-6.45	Silty Clay	6.6	Non-Aggressive	Non-Aggressive
BH207_10-10.5	Shale	7.8	Non-Aggressive	Non-Aggressive
BH208_0.5-0.95	Fill: Gravelly Silty Sand	8.1	Non-Aggressive	Non-Aggressive
BH208_4.5-4.95	Fill: Silty Clay	6.5	Non-Aggressive	Non-Aggressive
BH209_0.5-0.95	Fill: Silty Sand	7.8	Non-Aggressive	Non-Aggressive
BH209_3.0-3.45	Fill: Silty Sand	8.1	Non-Aggressive	Non-Aggressive
BH209_7.0-7.5	Shale	8	Non-Aggressive	Non-Aggressive
BH210_0.5-0.95	Fill: Silty Clay	7.5	Non-Aggressive	Non-Aggressive
BH210_3.0-3.45	Shale	7.4	Non-Aggressive	Non-Aggressive
BH211_0.5-0.95	Fill: Silty Clay	6.6	Non-Aggressive	Non-Aggressive
BH212_0.5-0.95	Fill: Silty Clay	7.2	Non-Aggressive	Non-Aggressive
BH212_3.0-3.45	Silty Clay	6.1	Non-Aggressive	Non-Aggressive
BH212_5.5-6.0	Shale	7.1	Non-Aggressive	Non-Aggressive
BH213_1.5-1.95	Fill: Silty Clay	7.3	Non-Aggressive	Non-Aggressive
BH213_4.0-4.3	Sandstone	7.9	Non-Aggressive	Non-Aggressive
BH214_0.5-0.95	Fill: Silty Clay	7.2	Non-Aggressive	Non-Aggressive
BH214_3.0-3.15	Shale	6.3	Non-Aggressive	Non-Aggressive
BH215_0.5-0.95	Fill: Sandy Silt	7.3	Non-Aggressive	Non-Aggressive
BH215_4.5-4.95	Silty Clay	7.2	Non-Aggressive	Non-Aggressive
BH215_5.5-6.0	Shale	7.9	Non-Aggressive	Non-Aggressive
BH215_8.0-8.3	Shale	7.8	Non-Aggressive	Non-Aggressive
BH216_0.5-0.95	Fill: Silty Clay	7.2	Non-Aggressive	Non-Aggressive
BH217_0.5-0.95	Fill: Silty Clay	6.7	Non-Aggressive	Non-Aggressive
BH217_1.5-1.95	Silty Clay	5	Mildly Aggressive	Non-Aggressive
BH218_0.5-0.95	Fill: Silty Clay	6.4	Non-Aggressive	Non-Aggressive
BH218_3.0-3.45	Silty Clay	6.2	Non-Aggressive	Non-Aggressive
BH219_0.5-0.95	Silty Clay	4.3	Moderately Aggressive	Non-Aggressive
BH219_2.5-3.0	Shale	6.4	Non-Aggressive	Non-Aggressive
TP220_0.4-0.5	Fill: Silty Clay	6.4	Non-Aggressive	Non-Aggressive
TP221_0.1-0.2	Fill: Silty Clay	5.8	Non-Aggressive	Non-Aggressive
TP221_0.9-1.0	Silty Clay	4.6	Mildly Aggressive	Non-Aggressive
TP222_0.1-0.2	Fill: Silty Clay	5.4	Mildly Aggressive	Non-Aggressive
TP222_0.9-1.0	Sandstone	5.5	Mildly Aggressive	Non-Aggressive
TP223_0.1-0.2	Fill: Silty Clay	6.1	Non-Aggressive	Non-Aggressive
TP224_0.0-0.2	Fill: Silty Clay	4.4	Moderately Aggressive	Non-Aggressive
TP225_1.1-1.3	Fill: Silty Clay	7.2	Non-Aggressive	Non-Aggressive
TP226_0.4-0.5	Fill: Silty Clay	6.8	Non-Aggressive	Non-Aggressive
TP227_0.3-0.5	Silty Clay	7.4	Non-Aggressive	Non-Aggressive
TP228_0.1-0.2	Fill: Sandy Silt	6.1	Non-Aggressive	Non-Aggressive
TP228_0.9-1.0	Fill: Silty Sand	7.4	Non-Aggressive	Non-Aggressive
TP229_0.0-0.1	Fill: Sandy Silt	5.9	Non-Aggressive	Non-Aggressive
TP229_1.1-1.3	Fill: Silty Clay	6.2	Non-Aggressive	Non-Aggressive
TP225_0.4-0.5	Fill: Sandy Silt	7.6	Non-Aggressive	Non-Aggressive
TP226_0.8-1.0	Fill: Silty Clay	7.1	Non-Aggressive	Non-Aggressive
Total Number of Samples		60	-	-
Minimum Value		4.3	-	-
Maximum Value		8.6	-	-

Explanation

1 - pH Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Tables 6.4.2 [C] & 6.5.2 [C])

2 - Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

pH Value	Classification for Concrete Piles
>5.5	Non-Aggressive
4.5 - 5.5	Mildly Aggressive
4 - 4.5	Moderately Aggressive
<4	Severely Aggressive

pH Value	Classification for Steel Piles
>5	Non-Aggressive
4.0 - 5.0	Non-Aggressive
3.0 - 4.0	Mildly Aggressive
<3	Moderately Aggressive

TABLE SD
SUMMARY OF SOIL LABORATORY RESULTS - SULPHATE & CHLORIDES

Borehole Number & Sample Depth	Sample Description	Sulphate (mg/kg)	Chloride (mg/kg)	Classification for Concrete Piles[1] SO4 - Soil Condition B[2]	Classification for Steel Piles[1] Cl - Soil Condition B[2]
BH201_0.5-0.95	Silty Clay	110	83	Non-Aggressive	Non-Aggressive
BH201_3.5-4.0	Shale	110	230	Non-Aggressive	Non-Aggressive
BH202_1.5-1.95	Silty Clay	220	920	Non-Aggressive	Non-Aggressive
BH202_2.5-3.0	Shale	120	280	Non-Aggressive	Non-Aggressive
BH203_0.5-0.95	Silty Clay	410	53	Non-Aggressive	Non-Aggressive
BH203_1.5-1.95	Shale	51	4	Non-Aggressive	Non-Aggressive
BH204_1.5-1.95	Silty Clay	160	1300	Non-Aggressive	Non-Aggressive
BH204_7.0-7.5	Shale	77	560	Non-Aggressive	Non-Aggressive
BH204_8.5-9.0	Shale	130	1300	Non-Aggressive	Non-Aggressive
BH205_0.5-0.95	Silty Clay	200	1100	Non-Aggressive	Non-Aggressive
BH205_3.0-3.45	Silty Clay	210	570	Non-Aggressive	Non-Aggressive
BH206_1.5-1.95	Fill: Silty Clay	10	250	Non-Aggressive	Non-Aggressive
BH206_4.0-4.5	Shale	66	400	Non-Aggressive	Non-Aggressive
BH206_7.0-7.5	Shale	54	260	Non-Aggressive	Non-Aggressive
BH207_0.5-0.95	Fill: Silty Clay	330	85	Non-Aggressive	Non-Aggressive
BH207_3.0-3.45	Fill: Silty Clay	160	63	Non-Aggressive	Non-Aggressive
BH207_6.0-6.45	Silty Clay	110	180	Non-Aggressive	Non-Aggressive
BH207_10-10.5	Shale	98	340	Non-Aggressive	Non-Aggressive
BH208_0.5-0.95	Fill: Gravelly Silty Sand	810	280	Non-Aggressive	Non-Aggressive
BH208_4.5-4.95	Fill: Silty Clay	48	230	Non-Aggressive	Non-Aggressive
BH209_0.5-0.95	Fill: Silty Sand	130	29	Non-Aggressive	Non-Aggressive
BH209_3.0-3.45	Fill: Silty Sand	37	23	Non-Aggressive	Non-Aggressive
BH209_7.0-7.5	Shale	40	240	Non-Aggressive	Non-Aggressive
BH210_0.5-0.95	Fill: Silty Clay	1200	50	Non-Aggressive	Non-Aggressive
BH210_3.0-3.45	Shale	29	46	Non-Aggressive	Non-Aggressive
BH211_0.5-0.95	Fill: Silty Clay	32	7	Non-Aggressive	Non-Aggressive
BH212_0.5-0.95	Fill: Silty Clay	38	9	Non-Aggressive	Non-Aggressive
BH212_3.0-3.45	Silty Clay	58	71	Non-Aggressive	Non-Aggressive
BH212_5.5-6.0	Shale	35	120	Non-Aggressive	Non-Aggressive
BH213_1.5-1.95	Fill: Silty Clay	150	44	Non-Aggressive	Non-Aggressive
BH213_4.0-4.3	Sandstone	29	34	Non-Aggressive	Non-Aggressive
BH214_0.5-0.95	Fill: Silty Clay	200	200	Non-Aggressive	Non-Aggressive
BH214_3.0-3.15	Shale	140	510	Non-Aggressive	Non-Aggressive
BH215_0.5-0.95	Fill: Sandy Silt	22	6	Non-Aggressive	Non-Aggressive
BH215_4.5-4.95	Silty Clay	91	450	Non-Aggressive	Non-Aggressive
BH215_5.5-6.0	Shale	84	280	Non-Aggressive	Non-Aggressive
BH215_8.0-8.3	Shale	60	230	Non-Aggressive	Non-Aggressive
BH216_0.5-0.95	Fill: Silty Clay	38	6	Non-Aggressive	Non-Aggressive
BH217_0.5-0.95	Fill: Silty Clay	58	18	Non-Aggressive	Non-Aggressive
BH217_1.5-1.95	Silty Clay	220	430	Non-Aggressive	Non-Aggressive
BH218_0.5-0.95	Fill: Silty Clay	380	390	Non-Aggressive	Non-Aggressive
BH218_3.0-3.45	Silty Clay	130	510	Non-Aggressive	Non-Aggressive
BH219_0.5-0.95	Silty Clay	290	1200	Non-Aggressive	Non-Aggressive
BH219_2.5-3.0	Shale	110	440	Non-Aggressive	Non-Aggressive
TP220_0.4-0.5	Fill: Silty Clay	78	28	Non-Aggressive	Non-Aggressive
TP221_0.1-0.2	Fill: Silty Clay	8	15	Non-Aggressive	Non-Aggressive
TP221_0.9-1.0	Silty Clay	190	580	Non-Aggressive	Non-Aggressive
TP222_0.1-0.2	Fill: Silty Clay	3	3	Non-Aggressive	Non-Aggressive
TP222_0.9-1.0	Sandstone	31	7	Non-Aggressive	Non-Aggressive
TP223_0.1-0.2	Fill: Silty Clay	10	9	Non-Aggressive	Non-Aggressive
TP224_0.0-0.2	Fill: Silty Clay	20	560	Non-Aggressive	Non-Aggressive
TP225_1.1-1.3	Fill: Silty Clay	740	180	Non-Aggressive	Non-Aggressive
TP226_0.4-0.5	Fill: Silty Clay	6	0	Non-Aggressive	Non-Aggressive
TP227_0.3-0.5	Silty Clay	170	1200	Non-Aggressive	Non-Aggressive
TP228_0.1-0.2	Fill: Sandy Silt	13	8	Non-Aggressive	Non-Aggressive
TP228_0.9-1.0	Fill: Silty Sand	44	14	Non-Aggressive	Non-Aggressive
TP229_0.0-0.1	Fill: Sandy Silt	11	22	Non-Aggressive	Non-Aggressive
TP229_1.1-1.3	Fill: Silty Clay	220	860	Non-Aggressive	Non-Aggressive
TP225_0.4-0.5	Fill: Sandy Silt	87	12	Non-Aggressive	Non-Aggressive
TP226_0.8-1.0	Fill: Silty Clay	54	4	Non-Aggressive	Non-Aggressive
Total Number of Samples		60	60	-	-
Minimum Value		3	0	-	-
Maximum Value		1200	1300	-	-

Explanation

1 - Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Tables 6.4.2 [C] & 6.5.2 [C])

2 - Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Sulphate (SO4) Values	Classification for Concrete Piles
<5,000	Non-Aggressive
5,000 - 10,000	Mildly Aggressive
10,000 - 20,000	Moderately Aggressive
>20,000	Severely Aggressive

Chloride (Cl) Values	Classification for Steel Piles
<5,000	Non-Aggressive
5,000 - 20,000	Non-Aggressive
20,000 - 50,000	Mildly Aggressive
>50,000	Moderately Aggressive

TABLE SE
SUMMARY OF SOIL LABORATORY RESULTS - CEC & ESP

Borehole Number & Sample Depth	Sample Description	Total CEC	Ca	K	Mg	Na	ESP[1]
		(meq/100g)					%
BH201_0.5-0.95	Silty Clay	13	1.3	0.35	9.4	2.1	16.2
BH202_1.5-1.95	Silty Clay	14	0.15	0.44	11	2.5	17.9
BH203_0.5-0.95	Silty Clay	10	1.5	0.14	6.1	2.6	26.0
BH204_1.5-1.95	Silty Clay	11	0.66	0.27	7.1	2.9	26.4
BH205_0.5-0.95	Silty Clay	11	2.7	0.21	5.5	2.7	24.5
BH206_1.5-1.95	Fill: Silty Clay	11	2.1	0.23	6.7	1.8	16.4
BH207_0.5-0.95	Fill: Silty Clay	18	6.1	0.41	9.3	2.5	13.9
BH208_0.5-0.95	Fill: Gravelly Silty Sand	24	14	0.42	7.6	1.8	7.5
BH209_0.5-0.95	Fill: Silty Sand	35	28	0.43	4	2	5.7
BH210_0.5-0.95	Fill: Silty Clay	22	16	0.24	5.1	0.81	3.7
BH211_0.5-0.95	Fill: Silty Clay	8.8	4.5	0.08	3.6	0.58	6.6
BH212_0.5-0.95	Fill: Silty Clay	32	27	0.55	4.9	0.38	1.2
BH213_1.5-1.95	Fill: Silty Clay	15	8.9	0.16	2.8	2.8	18.7
BH214_0.5-0.95	Fill: Silty Clay	16	4.7	0.47	8.1	2.3	14.4
BH215_0.5-0.95	Fill: Sandy Silt	37	32	0.39	3.9	0.55	1.5
BH216_0.5-0.95	Fill: Silty Clay	38	32	0.43	5	0.7	1.8
BH217_0.5-0.95	Fill: Silty Clay	13	6.1	0.34	5.9	0.79	6.1
BH218_0.5-0.95	Fill: Silty Clay	14	6.1	0.24	5.9	2	14.3
BH219_0.5-0.95	Silty Clay	15	0.83	0.4	12	2	13.3
TP220_0.4-0.5	Fill: Silty Clay	16	7	0.34	7.4	1.2	7.5
TP221_0.1-0.2	Fill: Silty Clay	8.7	3.3	0.27	4.5	0.56	6.4
TP222_0.1-0.2	Fill: Silty Clay	10	7.6	0.13	2.6	0.2	2.0
TP223_0.1-0.2	Fill: Silty Clay	16	8.1	0.3	6.9	0.73	4.6
TP224_0.0-0.2	Fill: Silty Clay	6.6	2.1	0.18	4	0.35	5.3
TP226_0.4-0.5	Fill: Silty Clay	16	13	0.37	2.7	0.17	1.1
TP227_0.3-0.5	Silty Clay	9	1.1	0.09	4.9	2.9	32.2
TP228_0.1-0.2	Fill: Sandy Silt	13	9.9	0.6	2	0.2	1.5
TP229_0.0-0.1	Fill: Sandy Silt	9.4	5.6	0.58	2.9	0.31	3.3
TP225_0.4-0.5	Fill: Sandy Silt	17	8.7	0.37	6.2	2	11.8
Total Number of Samples		29	29	29	29	29	29
Minimum Value		6.60	0.15	0.08	2.00	0.17	1.06
Maximum Value		38.00	32.00	0.60	12.00	2.90	32.22

Explanation
1 - Sodicity rating has been adopted from the publication *'Site Investigations for Urban Salinity' DLWC* 2002.

ESP Value	Sodicity Rating
< 5%	Non-Sodic
5% to 15%	Sodic
> 15%	Highly Sodic

Abbreviation
CEC: Cation Exchange Capacity
ESP: Exchangeable Sodium Percentage (Each Na/CEC)
Mg: Exchangeable Magnesium
Na: Exchangeable Sodium
K: Exchangeable Potassium
Ca: Exchangeable Calcium

SITE IDENTIFICATION:

Lots 200 & 201 in DP880404
Lot 14 in DP6796
Lots 14, 16 & 17 in DP809530
Lots 10 & 11 in DP818679

N

NOTES:
Figure 1 has been recreated from UBD on disc (version 5.0) and NSW Department of Lands SIX Maps. Figure is not to scale.

UBD Map ref: 188 F9, F10, G9, G10, H10 & H11

Reference should be made to the report text for a full understanding of this plan.

EIS
ENVIRONMENTAL INVESTIGATION SERVICES

Project Number:	Title:
E28870KB	SITE LOCATION PLAN
Figure: 1	Address: 170 RESERVOIR ROAD, ARNDELL PARK, NSW 2148

LEGEND

- Borehole
- Test Pit

Scale (m): 0 – 100	ENVIRONMENTAL INVESTIGATION SERVICES		
Title: **SITE B - TEST LOCATION PLAN**		Report Number: **E28870KB**	Figure Number: **2B**

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BOREHOLE LOG

Borehole No. 201
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 6-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 57.0m
Datum: AHD

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						0			FILL: Silty clay topsoil, medium plasticity, dark orange brown and dark brown, trace of ash.	MC>PL			GRASS COVER
					N = 10 3,5,5	1		CH	SILTY CLAY: high plasticity, dark orange brown mottled grey, trace of ash.	MC>PL	H	550 500 520	RESIDUAL
						2		-	SHALE: brown.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
									SHALE: brown and grey.	DW	L		LOW RESISTANCE
						3					L-M		LOW TO MODERATE RESISTANCE
						4			END OF BOREHOLE AT 4.1m				'TC' BIT REFUSAL
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 202
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 6-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 58.2m
Datum: AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty clay, high plasticity, dark brown and orange red brown, with roots and root fibres, fine to coarse grained igneous gravel, trace of ash.	MC>PL			GRASS COVER
					N = 7 4,5,2	1		CH	SILTY CLAY: high plasticity, light orange brown and light grey, trace of fine to coarse grained ironstone gravel, ash and root fibres.	MC>PL	H	>600 >600 >600	RESIDUAL
					N = 18 3,7,11	2			as above, but light grey.			>600 >600 >600	
						3		-	SHALE: brown, with M strength iron indurated bands.	DW	L		LOW 'TC' BIT RESISTANCE
											M		MODERATE TO HIGH RESISTANCE
						4			END OF BOREHOLE AT 3.6m				'TC' BIT REFUSAL
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 203
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 6-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 56.4m
Datum: AHD

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						0			FILL: Silty clay, medium plasticity, dark brown, with roots and root fibres, trace of ash.	MC≈PL			GRASS COVER APPEARS POORLY COMPACTED
					N = 16 3,5,11	1		CL	SILTY CLAY: medium plasticity, light orange brown, with fine to coarse grained ironstone gravel, trace of ash.	MC>PL	H	450 420 420	RESIDUAL
					SPT 6/50mm REFUSAL	2		-	SHALE: brown.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
						3			SHALE: grey.	DW	L		LOW RESISTANCE
						4							
						5					L-M		MODERATE RESISTANCE
						6			END OF BOREHOLE AT 5.8m				'TC' BIT REFUSAL
						7							

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BOREHOLE LOG

Borehole No. 204
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 2-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 52.3m
Datum: AHD

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
						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres.	MC<PL			GRASS COVER
▼ AFTER 24 HRS					N = 8 3,3,5	1		CH	SILTY CLAY: high plasticity, light grey mottled light orange brown.	MC>PL	VSt	200 220 200	RESIDUAL
					N = 7 3,3,4	2						200 220 220	
▼ ON COMPLET-ION					N = 5 2,2,3	3					F	50 75 50	
						4		-	SHALE: light brown.	DW	VL-L		VERY LOW TO LOW 'TC' BIT RESISTANCE
						5			SHALE: grey.	SW	L		LOW RESISTANCE WITH MODERATE BANDS
						6							
						7							

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BOREHOLE LOG

Borehole No. 204
2/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 2-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 52.3m
Datum: AHD
Logged/Checked by: L.M./D.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
						8			SHALE: grey.	SW	M		MODERATE RESISTANCE
						9			END OF BOREHOLE AT 9.0m				
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. **205** 1/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 52.7m

Date: 2-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
▼ AFTER 24 HRS						0			FILL: Silty clay, high plasticity, dark brown, with fine to coarse grained igneous gravel, trace of ash, roots and root fibres.	MC>PL			GRASS COVER
					N = 5 1,2,3	1		CH	SILTY CLAY: high plasticity, light grey mottled orange brown.	MC>PL	VSt	250 250 250	RESIDUAL
					N = 10 3,4,6	2							
					N = 18 4,9,9	3			as above, but with fine to coarse grained ironstone gravel.		St	150 180 150	
						4		-	SHALE: grey, with M-H strength iron indurated bands.	DW	VL-L		VERY LOW TO LOW 'TC' BIT RESISTANCE
						5					L		LOW TO MODERATE RESISTANCE
						6							
▼ ON COMPLET-ION						7					H		HIGH RESISTANCE

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BOREHOLE LOG

Borehole No. 205 2/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 52.7m

Date: 2-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
									SHALE: grey, with M-H strength iron indurated bands.	DW	H		'TC' BIT REFUSAL
									END OF BOREHOLE AT 7.1m				

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BOREHOLE LOG

Borehole No. 206
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 56.2m
Date: 2-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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
						0			FILL: Silty clay, medium plasticity, dark orange brown, with fine to coarse grained shale gravel and cobble sized shale, fine grained sandstone and igneous gravel, tile and brick fragments.	MC>PL			APPEARS POORLY COMPACTED
					N = 4 2,2,2							250 250 220	
						1							APPEARS WELL COMPACTED
					N = 11 4,5,6							580 550 580	
▼ AFTER 24 HRS						2							
								-	SHALE: grey and brown.	DW	L		LOW 'TC' BIT RESISTANCE
						3							
						4			SHALE: grey.				
						5							
										SW	L-M		LOW TO MODERATE RESISTANCE
						6							
						7							

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BOREHOLE LOG

Borehole No. 206
2/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 2-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 56.2m
Datum: AHD
Logged/Checked by: L.M./D.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
▼ ON COMPLET-ION						8			SHALE: grey.	SW	M		MODERATE RESISTANCE
						9			END OF BOREHOLE AT 9.0m				
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 207
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 2-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 59.5m
Datum: AHD

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
						0			FILL: Silty sand, fine to medium grained, light brown, with fine to coarse grained sandstone and igneous gravel, trace of tile and brick fragments.	D			GRASS COVER
										MC>PL			APPEARS WELL COMPACTED
					N = 14 4,7,7							580 580 550	
						1			FILL: Silty clay, medium plasticity, dark orange brown, with fine to coarse grained sandstone gravel and cobbles, trace of roots and root fibres.				
					N > 18 3,8,10/ 100mm							520 500 550	
					REFUSAL	2							
									FILL: Silty clay, high plasticity, dark grey, with fine to medium grained shale gravel.				
					N = 8 2,3,5	3						250 220 240	APPEARS MODERATELY TO WELL COMPACTED
▼ AFTER 24 HRS						4			FILL: Silty clay, high plasticity, grey.				
					N = 8 1,2,6							120 150 150	APPEARS MODERATELY COMPACTED
						5							
								CH	SILTY CLAY: high plasticity, dark orange brown mottled grey.	MC>PL	VSt		RESIDUAL
					N = 12 3,4,8	6						350 400 320	
▼ ON COMPLET-ION						7							

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BOREHOLE LOG

Borehole No. 207 2/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 59.5m

Date: 2-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
								CH	SILTY CLAY: high plasticity, dark orange brown mottled grey.	MC>PL	VSt		
				■	N = 8 2,3,5							250 250 240	
						8							
								-	SHALE: brown and grey.	DW	VL-L		LOW 'TC' BIT RESISTANCE
				■		9							
						10							
									END OF BOREHOLE AT 10.5m				
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 208
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 60.7m
Date: 2-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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
	■					0			FILL: Gravelly silty sand, fine to coarse grained, light brown, fine to coarse grained igneous and sandstone gravel.	D			GRASS COVER APPEARS WELL COMPACTED
				■	N = 13 10,8,5	1							
	■								FLL: Silty clay, medium plasticity, dark orange brown, with fine to coarse grained sandstone and igneous gravel, trace of ash.	MC≈PL	H	550 520 550	APPEARS POORLY COMPACTED
				■	N = 5 3,2,3	2							
						3			FILL: Silty clay, high plasticity, dark orange brown and dark grey, trace of ash.	MC>PL	VSt	250 250 250	
	■					4							
				■	N = 13 3,7,6							250 220 200	APPEARS WELL COMPACTED
▼ AFTER 24 HRS						5							
						6		CH	SILTY CLAY: high plasticity, orange brown mottled grey, trace of iron indurated bands.	MC>PL	VSt		RESIDUAL
	■			■	N = 18 4,8,10							350 350 350	
						7		-	SHALE: grey and light brown.	DW	L		

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BOREHOLE LOG

Borehole No. 208
2/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 2-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 60.7m
Datum: AHD
Logged/Checked by: L.M./D.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
									SHALE: grey and light brown	DW	L		LOW 'TC' BIT RESISTANCE
						8					L-M		LOW TO MODERATE RESISTANCE
						9			END OF BOREHOLE AT 9.0m				
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 209
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 6-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 60.2m
Datum: AHD
Logged/Checked by: L.M./D.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
						0			ASPHALTIC CONCRETE: 100mm.t				
					N = 19 7,10,9	1		-	FILL: Silty sand, fine to coarse grained, light brown, with fine to coarse grained igneous and sandstone gravel, trace of ash.	D	MD		APPEARS WELL COMPACTED
					N = 7 3,4,3	2					L		APPEARS POORLY COMPACTED
▶					N = 6 3,3,3	3							
						4			FILL: Silty clay, high plasticity, brown, with fine to coarse grained igneous and sandstone gravel, trace of ash.	MC>PL		350 300 300	HP READINGS ON REMOULDED SAMPLE
					N = 9 3,4,5	5		CH	SILTY CLAY: high plasticity, light orange brown, with fine to coarse grained ironstone gravel, trace of ash.	MC>PL	VSt	350 350 380	RESIDUAL
						6		-	SHALE: brown.	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
									SHALE: grey.	DW	L		LOW TO MODERATE RESISTANCE
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 209
2/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 60.2m

Date: 6-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
									SHALE:grey.	DW	L		
											M-H		MODERATE TO HIGH RESISTANCE 'TC' BIT REFUSAL
						8			END OF BOREHOLE AT 7.8m				
						9							
						10							
						11							
						12							
						13							
						14							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 210
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 60.7m

Date: 4-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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						0			ASPHALTIC CONCRETE: 100mm.t				
								-	FILL: Silty clay, medium plasticity, dark brown, with fine to coarse grained igneous gravel, ash and slag.	MC>PL	VSt		APPEARS WELL COMPACTED
					N = 18 8,10,8	1						350 400 380	
						2							
								CH	SILTY CLAY: high plasticity, red brown.	MC>PL	VSt	350 320 300	RESIDUAL HP TESTING OM REMOULDED SAMPLE
					N > 25 5,15, 11/100mm	3		-	SHALE: brown, with iron indurated bands.	XW-DW	EL-VL		VERY LOW TO LOW 'TC' BIT RESISTANCE
					REFUSAL					DW	M-H		MODERATE TO HIGH RESISTANCE 'TC' BIT REFUSAL
									END OF BOREHOLE AT 3.6m				
						4							
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 211
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 3-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 58.0m
Datum: AHD

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	■					0			FILL: Silty clay, medium plasticity, dark red brown, with roots and root fibres.	MC>PL	H		GRASS COVER
				■	N = 7 5,4,3							410 400 420	APPEARS MODERATELY COMPACTED
	■					1							
									FILL: Silty clay, low plasticity, brown, trace of ash.	MC<PL			APPEARS MODERATELY COMPACTED
	■			■	N > 12 3,12/ 150mm			CH	SILTY CLAY: high plasticity, orange brown, with iron indurated bands, trace of roots.	MC>PL			
				■	REFUSAL	2		-	SANDSTONE: fine to medium grained, brown.	DW	M-H		MODERATE TO HIGH 'TC' BIT RESISTANCE
									END OF BOREHOLE AT 2.0m				'TC' BIT REFUSAL
						3							
						4							
						5							
						6							
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 212
1/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 59.2m

Date: 3-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres, trace of ash.	MC<PL			GRASS COVER
					N = 8 3,3,5	1			FILL: Silty clay, medium plasticity, red brown, with fine to coarse grained sandstone and igneous gravel, trace of ash.	MC>PL		550 500 500	APPEARS MODERATELY COMPACTED
					N = 15 2,8,7	2						350 380 400	APPEARS WELL COMPACTED
					N = 15 5,7,8	3		CH	SILTY CLAY: high plasticity, red brown and brown, trace of coarse grained ironstone gravel.	MC>PL	H	500 450 480	RESIDUAL
					N = SPT 16/100mm REFUSAL	4		-	SHALE: brown	XW-DW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
▼ AFTER 30 MINS						5			SHALE: brown and grey.	DW	M		MODERATE RESISTANCE
						6							
						7							

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BOREHOLE LOG

Borehole No. 212
2/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 3-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 59.2m
Datum: AHD
Logged/Checked by: L.M./D.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
				■					SHALE: grey.	DW	M-H		MODERATE TO HIGH RESISTANCE
									END OF BOREHOLE AT 7.4m				'TC' BIT REFUSAL
						8							
						9							
						10							
						11							
						12							
						13							
						14							

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BOREHOLE LOG

Borehole No. 213
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** N/A

Date: 3-11-15 **Datum:**

Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, light brown, with roots and root fibres.	MC<PL			GRASS COVER
					N = 14 5,7,7	1			FILL: Silty clay, low plasticity, light brown, with shale gravel, trace of root fibres and ash.			>600 >600 >600	APPEARS WELL COMPACTED
					N = 11 2,5,6	2			FILL; Silty clay, high plasticity, brown.	MC>PL		150 150 150	
					N = 16 4,8,8	3		CH	SILTY CLAY: high plasticity, red brown, with fine to coarse grained ironstone gravel.	MC>PL	VSt	220 250 250	RESIDUAL
						4		-	SANDSTONE: fine to coarse grained, brown.	DW	L		LOW TO MODERATE 'TC' BIT RESISTANCE
											M-h		MODERATE TO HIGH RESISTANCE
						5			END OF BOREHOLE AT 4.3m				'TC' BIT REFUSAL
						6							
						7							

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BOREHOLE LOG

Borehole No. 214
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 63.0m

Date: 4-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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	■					0			FILL: Silty clay, low plasticity, dark brown.	MC<PL			GRASS COVER APPEARS POORLY COMPACTED
				■	N = 8 4,4,4	1			FILL: Silty clay, medium plasticity, dark brown, with shale gravel, trace of ash and root fibres.			580 580 580	APPEARS MODERATELY TO WELL COMPACTED
	■			■	N = 13 4,5,8	2		CH	SILTY CLAY: high plasticity, red and orange brown, with root fibres.	MC>PL	H	450 450 480	RESIDUAL
				■	N = SPT 12/150mm REFUSAL	3		-	SHALE: brown.	XW	EL-VL		VERY LOW 'TC' BIT RESISTANCE
						4				DW	VL		
						5			END OF BOREHOLE AT 4.3m				'TC' BIT REFUSAL
						6							
						7							

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BOREHOLE LOG

Borehole No. 215
1/2

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 3-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 59.2m
Datum: AHD

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						0			FILL: Silty sand, fine grained, light brown, with roots and root fibres, trace of clay nodules and fine to coarse grained igneous gravel and ash.	MC<PL			GRASS COVER APPEARS MODERATELY COMPACTED
					N = 9 4,4,5	1							
					N = 6 2,3,3	2			FILL: Silty clay, medium plasticity, red brown and dark brown, trace of ash.	MC>PL	VSt	250 250 250	
									FILL: Silty clay, high plasticity, red brown and dark brown, trace of ash.				
					N = 8 3,4,4	3		CH	SILTY CLAY: high plasticity, orange brown mottled grey.	MC>PL	VSt	250 220 220	
						4							
					N = 18 3,6,12	5						400 250 350	
						6		-	SHALE: brown and grey.	DW	VL		VERY LOW 'TC' BIT RESISTANCE
						7							

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BOREHOLE LOG

Borehole No. 215
2/2

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 59.2m

Date: 3-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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
						8			SHALE: grey.		L-M M		LOW TO MODERATE RESISTANCE
						9 10 11 12 13 14			END OF BOREHOLE AT 8.3m				'TC' BIT REFUSAL

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BOREHOLE LOG

Borehole No. 216
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** SPIRAL AUGER JK500 **R.L. Surface:** ≈ 59.8m

Date: 3-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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	■					0			FILL: Silty sand, fine grained, light brown, with roots and root fibres.	D			GRASS COVER
				■	N = 9 4,4,5	1			FILL: Silty clay, high plasticity, brown, with fine to coarse grained ironstone gravel, trace of ash, roots and root fibres.	MC>PL		350 350 300	APPEARS MODERATELY COMPACTED
				■	N = 9 2,4,5	2		CH	SILTY CLAY: high plasticity, red brown, trace of root fibres.	MC>PL	VSt	300 320 300	RESIDUAL
	■							-	SANDSTONE: fine to coarse grained, light brown.	DW	M-H		MODERATE TO HIGH 'TC' BIT RESISTANCE
						3			END OF BOREHOLE AT 2.7m				'TC' BIT REFUSAL
						4							
						5							
						6							
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 217
1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 4-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 62.3m
Datum: AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres.	D			GRASS COVER
					N = 8 5,5,3				FILL: Silty clay, medium plasticity, dark red brown, with fine to coarse grained sandstone gravel, trace of ash.	MC≈PL		600 580 570	APPEARS MOODERATELY COMPACTED
						1		CH	SILTY CLAY: high plasticity, orange brown mottled grey, with root fibres.	MC>PL	St-VSt		RESIDUAL
					N = 6 2,3,3							200 150 180	
						2							
								-	SANDSTONE: fine to medium grained, brown.	DW	L-M		LOW TO MODERATE 'TC' BIT RESISTANCE
						3							
						4			END OF BOREHOLE AT 4.0m				'TC' BIT REFUSAL
						5							
						6							
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 218
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 4-11-15
Method: SPIRAL AUGER JK500
R.L. Surface: ≈ 62.0m
Datum: AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, dark brown.	MC<PL			GRASS COVER
					N = 8 3,4,4	1			FILL: Silty clay, medium plasticity, dark brown, with ironstone gravel, trace of ash.	MC>PL	VSt	350 350 350	APPEARS MODERATELY COMPACTED
					N = 11 5,4,7	2			FILL: Silty clay, high plasticity, red brown, trace of ash.		H	>600 >600 >600	APPEARS WELL COMPACTED
						3		CL	SILTY CLAY: medium plasticity, red brown mottled grey, trace of ironstone gravel.	MC>PL	VSt		RESIDUAL
					N = 18 5,7,11							450 450 400	
						4		-	SHALE: grey, with iron indurated bands.	DW	L		LOW 'TC' BIT RESISTANCE
									END OF BOREHOLE AT 4.0m				'TC' BIT REFUSAL
						5							
						6							
						7							

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BOREHOLE LOG

Borehole No. 219
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD
Date: 4-11-15
Method: SPIRAL AUGER JK500
Logged/Checked by: L.M./D.S.
R.L. Surface: ≈ 63.4m
Datum: AHD

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						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres.	D			GRASS COVER
					N = 12 3,5,7	1		CL	SILTY CLAY: medium plasticity, orange brown.	MC<PL	H	500 520 480	RESIDUAL
					N > 8 5,8/100mm REFUSAL	2		-	SHALE: brown and grey.	DW	L	450 550 550	LOW 'TC' BIT RESISTANCE
						3			SHALE: grey.				
						4			END OF BOREHOLE AT 4.3m				'TC' BIT REFUSAL
						5							
						6							
						7							

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TEST PIT LOG

Test Pit No. 220 1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 63.4m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres, trace of ash.	D			GRASS COVER
									FILL: Silty clay, low plasticity, light brown, with shale gravel, trace of root fibres.	MC>PL		350	
						1			FILL: Silty clay, high plasticity, light grey and orange brown, with root fibres, trace of ash.			350	
									FILL: Silty clay, high plasticity, dark orange brown, trace of ironstone gravel and ash.			300	
												350	
												350	
												380	
									END OF TEST PIT AT 1.7m				LIMIT OF BACKHOE REACH
						2							
						3							
						4							
						5							
						6							
						7							

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TEST PIT LOG

Test Pit No. 221
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 57.5m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■			■		0			FILL: Silty clay, medium plasticity, dark brown, with roots and root fibres,	MC≈PL			GRASS COVER
	■			■				CH	fine to coarse grained igneous gravel, trace of ash.	MC>PL	H	500 480 510	RESIDUAL
									SILTY CLAY: high plasticity, light orange brown, trace of root fibres and ash.		VSt	350 320	
				■		1			as above, but light grey mottled orange brown.			300	
									END OF TEST PIT AT 1.1m				
						2							
						3							
						4							
						5							
						6							
						7							

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TEST PIT LOG

Test Pit No. 222
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 55.3m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■			■		0			FILL: Silty clay, medium plasticity, dark brown, with roots and root fibres, trace of ash.	MC≈PL			GRASS COVER
	■							CH	SILTY CLAY: high plasticity, dark orange brown mottled grey, trace of organic material and ash.	MC>PL	H	>600 >600	RESIDUAL
											VSt	350	
				■		1		-	as above, but light brown.	DW	VL	320 300	
									SANDSTONE: fine to medium grained, brown.				
									END OF TEST PIT AT 1.0m				
						2							
						3							
						4							
						5							
						6							
						7							

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TEST PIT LOG

Test Pit No. 223
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 53.5m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■			■		0			FILL: Silty clay, medium plasticity, dark brown, with roots and root fibres, trace of ash.	MC>PL			GRASS COVER
	■			■				CH	SILTY CLAY: high plasticity, light orange brown, trace of ash.	MC>PL	H	400 420 450	
											VSt	350 350	
						1			END OF TEST PIT AT 1.0m			350	
						2							
						3							
						4							
						5							
						6							
						7							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

TEST PIT LOG

Test Pit No. 224
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 52.6m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■			■		0			FILL: Silty clay, low plasticity, dark brown, with roots and root fibres.	MC<PL			GRASS COVER
	■			■				CH	SILTY CLAY: high plasticity, dark orange brown, trace of root fibres and ash.	MC>PL	VSt	250 300 300 250 300	
						1			END OF TEST PIT AT 1.0m			250	
						2							
						3							
						4							
						5							
						6							
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

TEST PIT LOG

Test Pit No. 225 1/1

Client: PAYNTER DIXON

Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT

Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 58.7m

Date: 5-11-15 **Datum:** AHD

Logged/Checked by: L.M./D.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						0			FILL: Silty clay, high plasticity, dark orange brown, with igneous and shale gravel, trace of ash and slag.	MC>PL			GRASS COVER
									FILL: Silty sand, fine grained, light brown, with fine to medium grained shale and sandstone gravel, trace of ash and slag.	MC<PL			
						1			FILL: Silty clay, high plasticity, dark brown, with fine to coarse grained sandstone, shale and igneous gravel and cobbles, trace of ash and slag.	MC>PL	VSt	350 320 350	
						2			END OF TEST PIT AT 1.5m				
						3							
						4							
						5							
						6							
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

TEST PIT LOG

Test Pit No. 226
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 60.2m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■					0			FILL: SiltY sand, fine grained, dark brown, trace of roots and root fibres and ash.	D			GRASS COVER
	■			■					FILL: Silty sand, fine to coarse grained, with fine to coarse grained sandstone and shale gravel, trace of ash, root fibres and fibro cement fragments.		VSt	250 250 280	HP TESTING ON REMOULDED SAMPLE
	■			■		1				MC>PL		350 300 300	
									FILL: Silty clay, low plasticity, dark brown, with fine to coarse grained igneous, sandstone and shale gravel, trace of ash, slag, tile, plastic and concrete fragments.				
									as above, but high plasticity.				
						2			END OF TEST PIT AT 1.5m				
						3							
						4							
						5							
						6							
						7							

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TEST PIT LOG

Test Pit No. 227
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 61.4m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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	■			■		0			FILL: Silty clay, high plasticity, dark brown, with roots and root fibres, trace of glass, fibro cement fragments, ash, slag and fragments.	MC>PL			GRASS COVER
	■			■				CL	SILTY CLAY: medium plasticity, light brown, trace of organic material and ash.	MC>PL	St	100 120 120	
						1			END OF TEST PIT AT 1.0m				
						2							
						3							
						4							
						5							
						6							
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

TEST PIT LOG

Test Pit No. 228
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 59.1m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres, trace of ash.	D			GRASS COVER
									FILL: Silty sand, fine to coarse grained, light brown, with clay nodules, shale gravel, trace of ash, slag and brick fragments.				
						1			FILL: Silty clay, high plasticity, light grey and red.	MC>PL	VSt	350 300 280	
									END OF TEST PIT AT 1.3m				LIMIT REACH OF BACKHOE
						2							
						3							
						4							
						5							
						6							
						7							

JK Geotechnics
GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

TEST PIT LOG

Test Pit No. 229
1/1

Client: PAYNTER DIXON
Project: PROPOSED SPORTS FACILITY & RESIDENTIAL DEVELOPMENT
Location: RESERVOIR ROAD, ARNDELL PARK, NSW

Job No. 28870AD **Method:** BACKHOE **R.L. Surface:** ≈ 59.8m
Date: 5-11-15 **Datum:** AHD
Logged/Checked by: L.M./D.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						0			FILL: Silty sand, fine grained, dark brown, with roots and root fibres, trace of ash.	D MC>PL		>600 >600 >600	GRASS COVER
									FILL: Silty clay, high plasticity, light brown, trace of ash.				
									FILL: Silty clay, high plasticity, light grey and orange brown, with shale gravel and cobbles, trace of ash.				
						1			FILL: Silty clay, medium plasticity, dark brown, trace of ash and organic material.			350 300 350	
									END OF TEST PIT AT 1.3m				
						2							
						3							
						4							
						5							
						6							
						7							

EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. Not all notes are necessarily relevant to all reports. Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions are directly relevant only to the ground at the place where, and time when, the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, the SAA Site Investigation Code. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2mm
Gravel	2 to 60mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as shown in the following table:

Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	Strength not attainable – soil crumbles

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'Shale' is used to describe thinly bedded to laminated siltstone.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact the backfill during construction, or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Premature refusal of the hand augers can occur on a variety of materials such as fill, hard clay, gravel or ironstone, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock fragments. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (e.g. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as CORE LOSS. The locations of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as: N = 13 (4, 6, 7)
- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as: N>30 (15, 30/40mm)

The results of the test can be related empirically to the engineering properties of the soil. Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test is where the same driving system is used with a solid 60 tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as "Nc" on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The attached explanatory notes define the terms and symbols used in preparation of the logs.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than "straight line"

variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open;
- A localised perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (e.g. bricks, concrete, plastic, slag/ash, steel etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. If the volume and quality of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classifications and rocks strengths indicated on the environmental logs unless noted in the report.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, EIS should be notified immediately.

GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

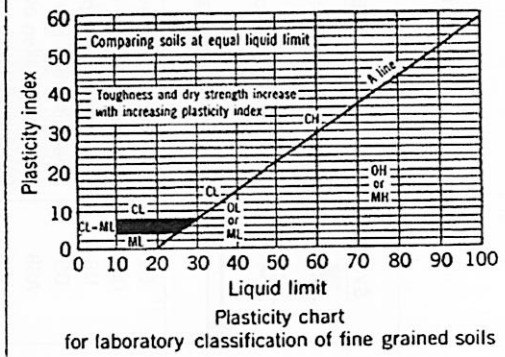
OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols[a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils: More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels: More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW, GP, SW, SP* More than 12% *GM, GC, SM, SC* 5% to 12% *Borderline* cases requiring use of dual symbols
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands: More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 Atterberg limits above "A" line, with *PI* greater than 7 Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 Atterberg limits below "A" line with *PI* greater than 7 Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols
Fine-grained soils: More than half of material is *smaller* than 75 μm sieve size	Identification Procedures on Fraction Smaller than 380 μm Sieve Size								
	Silts and clays: liquid limit less than 50		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
			None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity		
	Silts and clays: liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils		

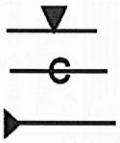


Plasticity chart
for laboratory classification of fine grained soils

Note: 1 Soils possessing characteristics of two groups are designated by combinations of group symbols (eg. GW-GC, well graded gravel-sand mixture with clay fines).
2 Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

EIS

LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown. Extent of borehole collapse shortly after drilling. Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25	Vane shear reading in kPa of Undrained Shear Strength.
	PID = 100	Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils)	MC>PL MC≈PL MC<PL	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit.
(Cohesionless)	D M W	DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)		**Density Index (ID) Range (%) — SPT ' N' Value Range (Blows/300mm)**
	VL	Very Loose <15 — 0-4
	L	Loose 15-35 — 4-10
	MD	Medium Dense 35-65 — 10-30
	D	Dense 65-85 — 30-50
	VD	Very Dense >85 — >50
	( )	Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Tungsten carbide wing bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL		Easily remoulded by hand to a material with soil properties.
		0.03	
Very Low:	VL		May be crumbled in the hand. Sandstone is "sugary" and friable.
		0.1	
Low:	L		A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
		0.3	
Medium Strength:	M		A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
		1	
High:	H		A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
		3	
Very High:	VH		A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
		10	
Extremely High:	EH		A piece of core 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

Appendix C

TRACE Environmental (2018) DSI

Borehole and Test Pit Logs, Figures, Tables

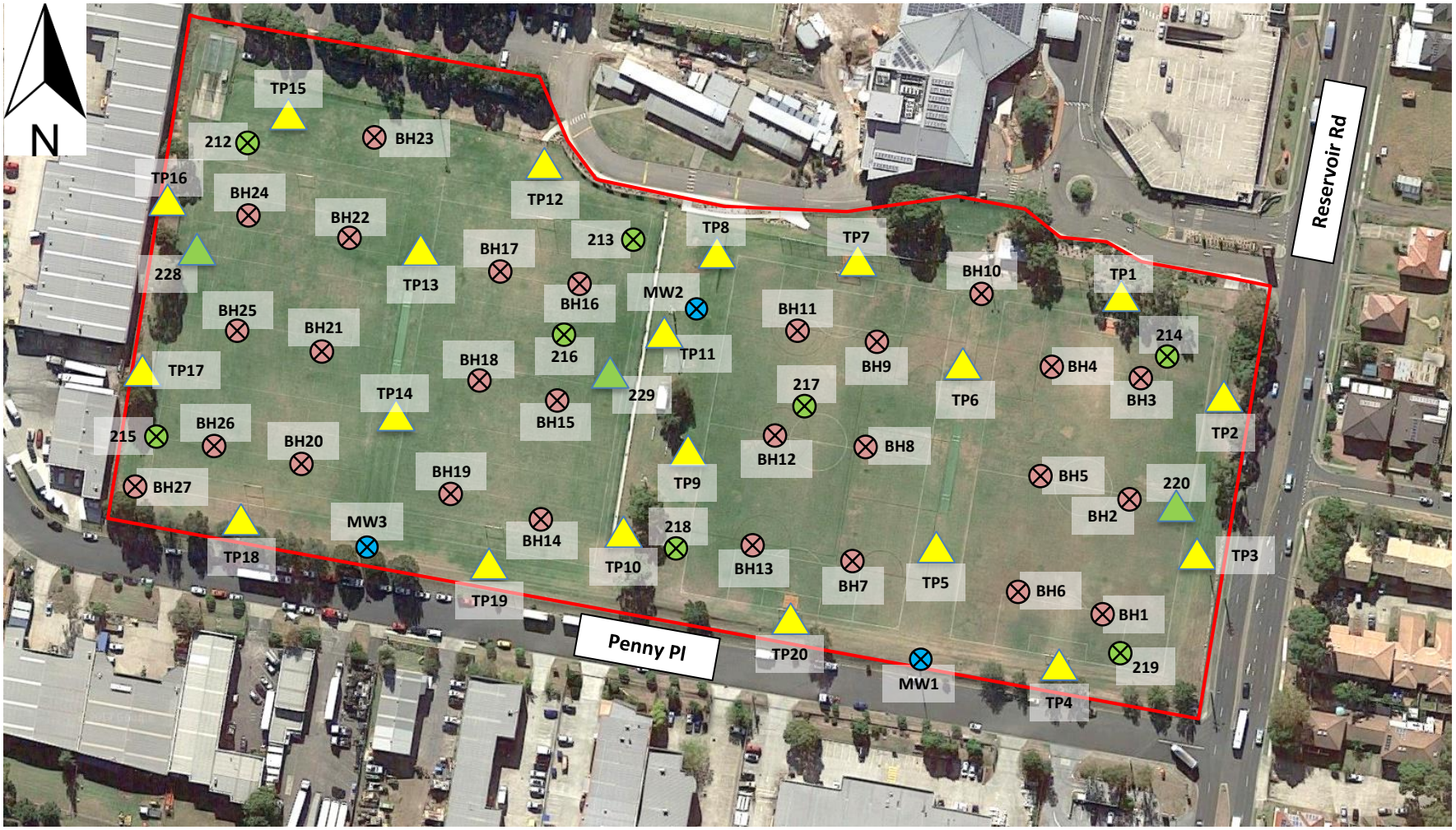
Source: Google Maps

TRACE ENVIRONMENTAL	Project: **99.28**	Title:	**Site Locality Plan**
	Figure: **1**	Address:	**170 Reservoir Road, Arndell Park, NSW**

Investigation Area Boundary

Source: Google

TRACE ENVIRONMENTAL	Project: **99.28**	Title:	**Site Plan**
	Figure: **2**	Address:	**170 Reservoir Road, Arndell Park, NSW**



Investigation Area Boundary | Groundwater Well Location | Borehole Location | Test Pit Location

Previous Borehole Location (EIS 2015) | Previous Test Pit Location (EIS 2015)

Source: Google

TRACE ENVIRONMENTAL	Project: **99.28**	Title:	**Current and Previous Sampling Locations**
	Figure: **3**	Address:	**170 Reservoir Road, Arndell Park, NSW**

Investigation Area Boundary | Groundwater Well Location | Borehole Location | Test Pit Location

Source: Google

TRACE ENVIRONMENTAL	Project: **99.28**	Title:	**Human Health Criteria Exceedances – Asbestos in Soil**
	Figure: **4**	Address:	**170 Reservoir Road, Arndell Park, NSW**

TRACE ENVIRONMENTAL	Project: **99.28**	Title:	**Encountered Depth of Fill Material**
	Figure: **5**	Address:	**170 Reservoir Road, Arndell Park, NSW**

Investigation Area Boundary Borehole Location Test Pit Location

Source: Google

TRACE ENVIRONMENTAL	Project: 99.28	Title:	Estimated Extent and Volume of Asbestos Impacted Fill Material
	Figure: 6	Address:	170 Reservoir Road, Arndell Park, NSW

TABLE 1:
SUMMARY OF SOIL SAMPLES COLLECTED
170 Reservoir Road, Arndell Park, NSW

Sample Identification	Date Collected	Material Type	Depth (mbgs)	PID (ppm)
BH1-0.2	8/01/2018	Fill	0.2	1.1
BH1-0.5	8/01/2018	Natural	0.5	0.0
BH1-1.6	8/01/2018	Natural	1.6	0.0
BH2-0.2	8/01/2018	Fill	0.2	2.8
BH2-0.5	8/01/2018	Fill	0.5	1.5
BH2-1.0	8/01/2018	Fill	1.0	2.5
BH2-2.0	8/01/2018	Natural	2.0	1.5
BH3-0.2	8/01/2018	Fill	0.2	-
BH3-0.5	8/01/2018	Fill	0.5	0.0
BH3-1.0	8/01/2018	Fill	1.0	1.4
BH3-2.0	8/01/2018	Fill	2.0	0.0
BH3-3.0	8/01/2018	Natural	3.0	3.0
BH4-0.2	8/01/2018	Fill	0.2	1.7
BH4-0.5	8/01/2018	Fill	0.5	1.4
QS1	8/01/2018			-
QS1A	8/01/2018			-
BH4-1.0	8/01/2018	Fill	1.0	3.0
BH4-2.0	8/01/2018	Fill	2.0	2.8
BH4-3.0	8/01/2018	Natural	3.0	2.2
BH5-0.2	8/01/2018	Fill	0.2	2.4
BH5-0.5	8/01/2018	Fill	0.5	3.8
BH5-1.0	8/01/2018	Fill	1.0	3.3
BH5-2.0	8/01/2018	Natural	2.0	0.0
BH6-0.2	8/01/2018	Fill	0.2	0.8
BH6-0.5	8/01/2018	Natural	0.5	1.5
BH6-1.0	8/01/2018	Natural	1.0	1.5
BH7-0.2	9/01/2018	Natural	0.2	0.0
BH7-0.5	9/01/2018	Natural	0.5	0.0
BH7-1.0	9/01/2018	Natural	1.0	0.0
BH8-0.2	9/01/2018	Fill	0.2	0.0
BH8-0.6	9/01/2018	Fill	0.6	0.5
BH8-1.2	9/01/2018	Natural	1.2	0.6
BH9-0.2	9/01/2018	Fill	0.2	0.6
BH9-0.8	9/01/2018	Fill	0.8	0.7
BH9-2.6	9/01/2018	Fill	2.6	0.0
BH9-3.2	9/01/2018	Natural	3.2	0.4
BH10-0.2	9/01/2018	Fill	0.2	0.0
BH10-0.8	9/01/2018	Fill	0.8	0.4
BH10-2.0	9/01/2018	Fill	2.0	0.5
BH10-3.0	9/01/2018	Natural	3.0	0.8
BH11-0.2	9/01/2018	Fill	0.2	0.0
BH11-0.5	9/01/2018	Fill	0.5	0.5
BH11-1.5	9/01/2018	Fill	1.5	0.5
BH11-2.7	9/01/2018	Natural	2.7	0.0
BH12-0.2	9/01/2018	Fill	0.2	0.0
BH12-0.5	9/01/2018	Fill	0.5	0.0
BH12-1.0	9/01/2018	Fill	1.0	0.7
BH12-2.1	9/01/2018	Natural	2.1	0.3
BH13-0.2	9/01/2018	Fill	0.2	0.0
BH13-0.5	9/01/2018	Fill	0.5	0.0
BH13-1.0	9/01/2018	Fill	1.0	0.8
BH13-2.0	9/01/2018	Natural	2.0	0.5
BH14-0.2	9/01/2018	Fill	0.2	0.0
BH14-0.5	9/01/2018	Natural	0.5	0.3
BH14-1.0	9/01/2018	Natural	1.0	0.5
BH15-0.2	9/01/2018	Fill	0.2	0.0
BH15-0.8	9/01/2018	Fill	0.8	0.0
BH15-1.5	9/01/2018	Natural	1.5	0.0
BH16-0.2	9/01/2018	Fill	0.2	0.0
BH16-0.5	9/01/2018	Fill	0.5	0.0
BH16-1.5	9/01/2018	Fill	1.5	0.0
BH16-2.2	9/01/2018	Natural	2.2	0.0
BH17-0.2	9/01/2018	Fill	0.2	0.0
BH17-0.5	9/01/2018	Fill	0.5	0.0
BH17-1.0	9/01/2018	Fill	1.0	0.0
BH17-2.1	9/01/2018	Natural	2.1	0.0
BH18-0.2	10/01/2018	Fill	0.2	0.0
BH18-0.5	10/01/2018	Fill	0.5	0.0
BH18-1.0	10/01/2018	Natural	1.0	0.0

Notes:
mbgs - metres below ground surface
PID - Photoionisation Detector; ppm - parts per million
QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4-0.5
QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2-0.5
QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3-0.5
QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1-0.5
QS-5 and QS-5A - Duplicate/Triplicate Samples of TP3-0.5
QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8-0.5
QS-7 and QS-7A - Duplicate/Triplicate Samples of TP18-0.7
QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19-0.3

TABLE 1:
SUMMARY OF SOIL SAMPLES COLLECTED
170 Reservoir Road, Arndell Park, NSW

Sample Identification	Date Collected	Material Type	Depth (mbgs)	PID (ppm)
BH19-0.2	10/01/2018	Fill	0.2	0.0
BH19-0.5	10/01/2018	Fill	0.5	0.3
BH19-1.1	10/01/2018	Natural	1.1	0.0
BH20-0.3	10/01/2018	Fill	0.3	0.0
BH20-0.8	10/01/2018	Fill	0.8	0.0
BH20-1.5	10/01/2018	Natural	1.5	0.0
BH21-0.2	10/01/2018	Fill	0.2	0.0
BH21-0.5	10/01/2018	Fill	0.5	0.0
BH21-1.0	10/01/2018	Fill	1.0	-
BH21-2.6	10/01/2018	Natural	2.6	0.0
BH22-0.4	10/01/2018	Fill	0.4	0.0
BH22-1.2	10/01/2018	Fill	1.2	0.0
BH22-2.3	10/01/2018	Natural	2.3	0.0
BH23-0.3	10/01/2018	Fill	0.3	0.0
BH23-1.2	10/01/2018	Fill	1.2	0.0
BH23-2.3	10/01/2018	Fill	2.3	0.0
BH23-2.7	10/01/2018	Natural	2.7	0.0
BH24-0.2	10/01/2018	Fill	0.2	0.0
BH24-0.5	10/01/2018	Fill	0.5	0.0
BH24-1.2	10/01/2018	Fill	1.2	0.0
BH24-2.6	10/01/2018	Natural	2.6	0.0
BH25-0.2	10/01/2018	Fill	0.2	0.0
BH25-0.5	10/01/2018	Fill	0.5	0.0
BH25-1.0	10/01/2018	Fill	1.0	0.0
BH25-2.0	10/01/2018	Natural	2.0	0.0
BH26-0.3	10/01/2018	Fill	0.3	0.0
BH26-0.8	10/01/2018	Fill	0.8	0.0
BH26-1.2	10/01/2018	Fill	1.2	0.0
BH26-2.5	10/01/2018	Natural	2.5	0.0
BH27-0.4	10/01/2018	Fill	0.4	0.0
BH27-0.8	10/01/2018	Fill	0.8	0.0
BH27-1.5	10/01/2018	Fill	1.5	0.0
BH27-3.2	10/01/2018	Natural	3.2	0.0
MW1-0.2	8/01/2018	Fill	0.2	0.0
MW1-0.5	8/01/2018	Natural	0.5	0.0
MW1-1.0	8/01/2018	Natural	1.0	0.0
MW1-2.0	8/01/2018	Natural	2.0	0.0
MW2-0.2	9/01/2018	Fill	0.2	0.0
MW2-0.5	9/01/2018	Fill	0.5	0.0
QS2	9/01/2018			-
QS2A	9/01/2018			-
MW2-1.0	9/01/2018	Fill	1.0	0.0
MW2-2.3	9/01/2018	Natural	2.3	0.0
MW3-0.2	10/01/2018	Fill	0.2	0.6
MW3-0.5	10/01/2018	Fill	0.5	0.4
QS3	10/01/2018			-
QS3A	10/01/2018			-
MW3-1.1	10/01/2018	Natural	1.1	0.0
MW3-2.2	10/01/2018	Natural	2.2	0.0
TP1-0.2	11/01/2018	Fill	0.2	0.0
TP1-0.5	11/01/2018	Fill	0.5	0.0
QS4	11/01/2018			-
QS4A	11/01/2018			-
TP1-1.0	11/01/2018	Natural	1.0	0.0
TP2-0.2	11/01/2018	Fill	0.2	0.0
TP2-0.4	11/01/2018	Fill	0.4	0.0
TP2-1.0	11/01/2018	Fill	1.0	0.0
TP2-1.5	11/01/2018	Natural	1.5	0.0
TP3-0.2	11/01/2018	Fill	0.2	0.0
TP3-0.5	11/01/2018	Fill	0.5	0.0
QS5	11/01/2018			-
QS5A	11/01/2018			-
TP3-1.0	11/01/2018	Natural	1.0	1.1
TP4-0.3	11/01/2018	Fill	0.3	0.0
TP4-0.6	11/01/2018	Natural	0.6	0.8
TP5-0.2	11/01/2018	Fill	0.2	0.0
TP5-0.6	11/01/2018	Natural	0.6	0.0
TP6-0.2	11/01/2018	Fill	0.2	0.0
TP6-0.5	11/01/2018	Fill	0.5	0.0

Notes:

mbgs - metres below ground surface

PID - Photoionisation Detector; ppm - parts per million

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4-0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2-0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3-0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1-0.5

QS-5 and QS-5A - Duplicate/Triplicate Samples of TP3-0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8-0.5

QS-7 and QS-7A - Duplicate/Triplicate Samples of TP18-0.7

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19-0.3

TABLE 1:
SUMMARY OF SOIL SAMPLES COLLECTED
170 Reservoir Road, Arndell Park, NSW

Sample Identification	Date Collected	Material Type	Depth (mbgs)	PID (ppm)
TP6-1.0	11/01/2018	Fill	1.0	0.0
TP6-2.6	11/01/2018	Natural	2.6	0.0
TP7-0.2	11/01/2018	Fill	0.2	0.0
TP7-0.5	11/01/2018	Fill	0.5	0.0
TP7-1.5	11/01/2018	Fill	1.5	0.0
TP7-2.8	11/01/2018	Natural	2.8	0.0
TP8-0.2	11/01/2018	Fill	0.2	0.0
TP8-0.5	11/01/2018	Fill	0.5	0.0
QS6	11/01/2018			-
QS6A	11/01/2018			-
TP8-1.5	11/01/2018	Fill	1.5	0.4
TP8-3.0	11/01/2018	Fill	3.0	0.0
TP9-0.2	12/01/2018	Fill	0.2	1.9
TP9-0.5	12/01/2018	Fill	0.5	2.1
TP9-1.2	12/01/2018	Fill	1.2	1.5
TP9-2.0	12/01/2018	Natural	2.0	0.9
TP10-0.2	12/01/2018	Fill	0.2	1.5
TP10-0.6	12/01/2018	Natural	0.6	2.0
TP11-0.3	12/01/2018	Fill	0.3	2.9
TP11-1.0	12/01/2018	Fill	1.0	3.0
TP11-2.0	12/01/2018	Natural	2.0	2.7
TP12-0.2	12/01/2018	Fill	0.2	1.1
TP12-1.2	12/01/2018	Fill	1.2	1.0
TP12-2.3	12/01/2018	Natural	2.3	0.6
TP13-0.2	12/01/2018	Fill	0.2	-
TP13-0.5	12/01/2018	Fill	0.5	-
TP13-1.0	12/01/2018	Fill	1.0	-
TP13-2.0	12/01/2018	Natural	2.0	-
TP14-0.4	12/01/2018	Fill	0.4	0.0
TP14-1.0	12/01/2018	Natural	1.0	0.0
TP14-1.8	12/01/2018	Natural	1.8	0.0
TP15-0.3	12/01/2018	Fill	0.3	1.1
TP15-1.2	12/01/2018	Fill	1.2	1.4
TP15-2.5	12/01/2018	Natural	2.5	0.8
TP16-0.4	12/01/2018	Fill	0.4	1.9
TP16-1.3	12/01/2018	Fill	1.3	2.1
TP16-2.0	12/01/2018	Fill	2.0	1.7
TP17-0.2	12/01/2018	Fill	0.2	2.3
TP17-0.5	12/01/2018	Fill	0.5	1.2
TP17-1.0	12/01/2018	Fill	1.0	0.9
TP17-2.5	12/01/2018	Natural	2.5	0.7
TP18-0.2	12/01/2018	Fill	0.2	0.0
TP18-0.7	12/01/2018	Fill	0.7	0.0
QS7	12/01/2018			-
QS7A	12/01/2018			-
TP18-1.2	12/01/2018	Fill	1.2	0.0
TP18-1.9	12/01/2018	Natural	1.9	0.0
TP19-0.3	12/01/2018	Natural	0.3	0.0
QS8	12/01/2018			-
QS8A	12/01/2018			-
TP19-0.6	12/01/2018	Natural	0.6	0.0
TP20-0.3	12/01/2018	Fill	0.3	0.0
TP20-0.9	12/01/2018	Natural	0.9	0.0

Notes:

mbgs - metres below ground surface

PID - Photoionisation Detector; ppm - parts per million

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4-0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2-0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3-0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1-0.5

QS-5 and QS-5A - Duplicate/Triplicate Samples of TP3-0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8-0.5

QS-7 and QS-7A - Duplicate/Triplicate Samples of TP18-0.7

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19-0.3

TRACE ENVIRONMENTAL

TABLE 2:
SUMMARY OF SOIL ANALYTICAL RESULTS - TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						BH1-0.2	BH1-0.5	BH3-0.5	BH3-2.0	BH4-0.5	QS1	RPD%	QS1A	RPD%	BH5-0.2	BH5-1.0	BH6-0.2	BH7-0.2	BH8-0.2	BH8-0.6	BH9-0.2	BH9-2.6
Sample Date						8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018					8/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type						Fill	Natural	Fill	Fill	Fill					Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]																	
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 50	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C29 - C36 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6 - C10 Fraction	20	82,000	5,600	5,100	180	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction	50	62,000	4,200	3,800	120	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16 - C34 Fraction	100	85,000	5,800	5,300	300	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
>C34 - C40 Fraction	100	120,000	8,100	7,400	2,800	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	0.1	1,100	140	120	50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	120,000	21,000	18,000	85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	85,000	5,900	5,300	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene	0.2	NE	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0%	< 0.5	0%	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
ortho-Xylene	0.1	NE	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Xylenes	0.3	130,000	17,000	15,000	105	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	0.5	29,000	2,200	1,900	170	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

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3. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
4. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (5) and (6) - Urban residential and public open space, Coarse soils

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 2:
SUMMARY OF SOIL ANALYTICAL RESULTS -
TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						BH10-0.2	BH11-0.5	BH11-1.5	BH12-2.1	BH13-0.2	BH13-1.0	BH14-0.2	BH15-0.2	BH15-0.8	BH16-0.2	BH17-0.2	BH17-0.5	BH18-0.2	BH18-0.5	BH19-0.5	BH20-0.3
Sample Date						9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type						Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]																
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C29 - C36 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
C6 - C10 Fraction	20	82,000	5,600	5,100	180	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction	50	62,000	4,200	3,800	120	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16 - C34 Fraction	100	85,000	5,800	5,300	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
>C34 - C40 Fraction	100	120,000	8,100	7,400	2,800	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	0.1	1,100	140	120	50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	120,000	21,000	18,000	85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	85,000	5,900	5,300	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene	0.2	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	< 0.2	< 0.2	< 0.2
ortho-Xylene	0.1	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	< 0.1	< 0.1	< 0.1
Total Xylenes	0.3	130,000	17,000	15,000	105	< 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	< 0.3	< 0.3	< 0.3
Naphthalene	0.5	29,000	2,200	1,900	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	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Direct Contact - Intrusive Maintenance Worker in a 1m trench
2. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (High Density Residential)
3. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
4. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (5) and (6) - Urban residential and public open space, Coarse soils

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 2:
SUMMARY OF SOIL ANALYTICAL RESULTS - TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						BH20-0.8	BH21-0.5	BH22-0.4	BH23-0.3	BH23-2.3	BH24-0.2	BH24-0.5	BH25-0.5	BH26-0.3	BH26-0.8	BH27-0.4	MW1-0.2	MW2-0.5	QS2	RPD%	QS2A	RPD%
Sample Date						10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	8/01/2018	9/01/2018				
Material Type						Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill				
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]																	
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%
C10 - C14 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 50	0%
C15 - C28 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%
C29 - C36 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%
C6 - C10 Fraction	20	82,000	5,600	5,100	180	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%
>C10 - C16 Fraction	50	62,000	4,200	3,800	120	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%
>C16 - C34 Fraction	100	85,000	5,800	5,300	300	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%
>C34 - C40 Fraction	100	120,000	8,100	7,400	2,800	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%
Benzene	0.1	1,100	140	120	50	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%
Toluene	0.1	120,000	21,000	18,000	85	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%
Ethylbenzene	0.1	85,000	5,900	5,300	70	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%
meta- & para-Xylene	0.2	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	< 0.2	0%	< 0.5	0%
ortho-Xylene	0.1	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	< 0.1	0%	< 0.5	0%
Total Xylenes	0.3	130,000	17,000	15,000	105	< 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	< 0.3	0%	< 0.5	0%
Naphthalene	0.5	29,000	2,200	1,900	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	< 0.5	0%	< 1	0%

Notes:

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TRACE ENVIRONMENTAL

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SUMMARY OF SOIL ANALYTICAL RESULTS -
TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						MW2-1.0	MW3-0.2	MW3-0.5	QS3	RPD%	QS3A	RPD%	TP1-0.2	TP1-0.5	QS4	RPD%	QS4A	RPD%	TP2-0.2	TP2-0.4	TP3-0.5	TP4-0.3	TP4-0.6
Sample Date						9/01/2018	10/01/2018	10/01/2018					11/01/2018	11/01/2018					11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018
Material Type						Fill	Fill	Fill					Fill	Fill					Fill	Fill	Fill	Fill	Natural
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]																		
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20
C10 - C14 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	0%	< 50	0%	< 20	< 20	< 20	0%	< 50	0%	< 20	< 20	< 20	< 20	< 20
C15 - C28 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	< 50	< 50	0%	< 100	0%	**130**	< 50	< 50	< 50	< 50
C29 - C36 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	< 50	< 50	0%	< 100	0%	**120**	< 50	< 50	< 50	< 50
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	0%	< 50	0%	**250**	< 50	< 50	< 50	< 50
C6 - C10 Fraction	20	**82,000**	**5,600**	**5,100**	**180**	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction	50	**62,000**	**4,200**	**3,800**	**120**	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50
>C16 - C34 Fraction	100	**85,000**	**5,800**	**5,300**	**300**	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	< 100	< 100	0%	< 100	0%	**200**	< 100	< 100	< 100	< 100
>C34 - C40 Fraction	100	**120,000**	**8,100**	**7,400**	**2,800**	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	< 100	< 100	0%	< 100	0%	< 100	< 100	< 100	< 100	< 100
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50
Benzene	0.1	**1,100**	**140**	**120**	**50**	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	**120,000**	**21,000**	**18,000**	**85**	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	**85,000**	**5,900**	**5,300**	**70**	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene	0.2	NE	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	0%	< 0.5	0%	< 0.2	< 0.2	< 0.2	0%	< 0.5	0%	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
ortho-Xylene	0.1	NE	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Xylenes	0.3	**130,000**	**17,000**	**15,000**	**105**	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	0.5	**29,000**	**2,200**	**1,900**	**170**	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

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<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 2:
SUMMARY OF SOIL ANALYTICAL RESULTS -
TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						TP5-0.2	TP6-0.2	TP6-1.0	TP7-1.5	TP8-0.5	QS6	RPD%	QS6A	RPD%	TP8-1.5	TP9-0.2	TP9-0.5	TP11-0.3	TP12-0.2	TP13-0.2	TP13-0.5	TP14-0.4
Sample Date						11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018					11/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type						Fill	Fill	Fill	Fill	Fill					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]																	
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C10 - C14 Fraction	20	NE	NE	NE	NE	**27**	< 20	< 20	< 20	< 20	< 20	0%	< 50	0%	< 20	**24**	< 20	< 20	< 20	< 20	< 20	< 20
C15 - C28 Fraction	50	NE	NE	NE	NE	**68**	**190**	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	**150**	< 50	< 50	< 50	< 50	< 50	< 50
C29 - C36 Fraction	50	NE	NE	NE	NE	**73**	**84**	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50	**120**	< 50	< 50	**64**	< 50	< 50	< 50
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	**168**	**274**	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	**294**	< 50	< 50	**64**	< 50	< 50	< 50
C6 - C10 Fraction	20	**82,000**	**5,600**	**5,100**	**180**	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction	50	**62,000**	**4,200**	**3,800**	**120**	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
>C16 - C34 Fraction	100	**85,000**	**5,800**	**5,300**	**300**	**110**	**230**	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	**200**	< 100	< 100	< 100	< 100	< 100	< 100
>C34 - C40 Fraction	100	**120,000**	**8,100**	**7,400**	**2,800**	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100	**100**	< 100	< 100	< 100	< 100	< 100	< 100
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50
Benzene	0.1	**1,100**	**140**	**120**	**50**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	**120,000**	**21,000**	**18,000**	**85**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	**85,000**	**5,900**	**5,300**	**70**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- & para-Xylene	0.2	NE	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0%	< 0.5	0%	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
ortho-Xylene	0.1	NE	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Xylenes	0.3	**130,000**	**17,000**	**15,000**	**105**	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	0.5	**29,000**	**2,200**	**1,900**	**170**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:
All units are in mg/kg unless otherwise noted
Only sample results analysed for the COPCs on this table are included
1. CRC CARE 2011 Health Screening Level for Direct Contact - Intrusive Maintenance Worker in a 1m trench
2. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (High Density Residential)
3. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
4. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (5) and (6) - Urban residential and public open space, Coarse soils
LOR - Limits of Reporting
NL - Not Limiting
NE - Not Established
QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5
QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5
QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5
QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5
QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5
QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3
High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:
No Limit (<10 x LOR)
<30% RPD (Inorganic)
<50% RPD (Organic)

TABLE 2:
SUMMARY OF SOIL ANALYTICAL RESULTS - TRH AND BTEX
170 Reservoir Road, Arndell Park, NSW

Sample ID						TP15-0.3	TP15-1.2	TP16-0.4	TP17-0.2	TP17-0.5	TP18-0.7	TP18-1.2	TP19-0.3	QS8	RPD%	QS8A	RPD%	TP20-0.3
Sample Date						12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018					12/01/2018
Material Type						Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural					Fill
Compounds	LOR	HSL Intrusive Maintenance Worker [1]	HSL Direct Contact [2]	HSL Direct Contact [3]	EILs/ESLs [4]													
C6 - C9 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20
C10 - C14 Fraction	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 50	0%	< 20
C15 - C28 Fraction	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50
C29 - C36 Fraction	50	NE	NE	NE	NE	**56**	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 100	0%	< 50
C10 - C36 Fraction (sum)	50	NE	NE	NE	NE	**56**	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50
C6 - C10 Fraction	20	**82,000**	**5,600**	**5,100**	**180**	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20
C6 - C10 Fraction F1	20	NE	NE	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20
>C10 - C16 Fraction	50	**62,000**	**4,200**	**3,800**	**120**	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50
>C16 - C34 Fraction	100	**85,000**	**5,800**	**5,300**	**300**	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100
>C34 - C40 Fraction	100	**120,000**	**8,100**	**7,400**	**2,800**	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	0%	< 100	0%	< 100
>C10 - C16 Fraction F2	50	NE	NE	NE	NE	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50
Benzene	0.1	**1,100**	**140**	**120**	**50**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1
Toluene	0.1	**120,000**	**21,000**	**18,000**	**85**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1
Ethylbenzene	0.1	**85,000**	**5,900**	**5,300**	**70**	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1
meta- & para-Xylene	0.2	NE	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	0%	< 0.5	0%	< 0.2
ortho-Xylene	0.1	NE	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1
Total Xylenes	0.3	**130,000**	**17,000**	**15,000**	**105**	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3
Naphthalene	0.5	**29,000**	**2,200**	**1,900**	**170**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Direct Contact - Intrusive Maintenance Worker in a 1m trench
2. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (High Density Residential)
3. CRC CARE 2011 Health Screening Level for Direct Contact with Soil (Recreational/Open Space)
4. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (5) and (6) - Urban residential and public open space, Coarse soils

LOR - Limits of Reporting

NL - Not Limiting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID									BH1-0.2	BH1-0.5	BH3-0.5	BH3-2.0	BH4-0.5	QS1	RPD%	QS1A	RPD%	BH5-0.2	BH5-1.0	BH6-0.2	BH7-0.2	BH8-0.2	BH8-0.6	BH9-0.2
Sample Date									8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018					8/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type									Fill	Natural	Fill	Fill	Fill					Fill	Fill	Fill	Natural	Fill	Fill	Fill
Compounds	**LOR**	**HSL Intrusive Maintenance Worker 0 to <2 m[1]**	**CLAY HSL A/B 0 to <1 m[2]**	**CLAY HSL A/B 1 to <2 m[2]**	**CLAY HSL A/B 2 to <4 m[2]**	**CLAY HSL D 0 to <1 m[3]**	**CLAY HSL D 1 to <2 m[3]**	**CLAY HSL D 2 to <4 m[3]**																	
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID									BH9-2.6	BH10-0.2	BH11-0.5	BH11-1.5	BH12-2.1	BH13-0.2	BH13-1.0	BH14-0.2	BH15-0.2	BH15-0.8	BH16-0.2	BH17-0.2	BH17-0.5	BH18-0.2	BH18-0.5
Sample Date									9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	10/01/2018	10/01/2018
Material Type									Fill	Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	**LOR**	**HSL Intrusive Maintenance Worker 0 to <2 m[1]**	**CLAY HSL A/B 0 to <1 m[2]**	**CLAY HSL A/B 1 to <2 m[2]**	**CLAY HSL A/B 2 to <4 m[2]**	**CLAY HSL D 0 to <1 m[3]**	**CLAY HSL D 1 to <2 m[3]**	**CLAY HSL D 2 to <4 m[3]**															
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 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	< 0.3	< 0.3
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID									BH19-0.5	BH20-0.3	BH20-0.8	BH21-0.5	BH22-0.4	BH23-0.3	BH23-2.3	BH24-0.2	BH24-0.5	BH25-0.5	BH26-0.3	BH26-0.8	BH27-0.4	MW1-0.2
Sample Date									10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	8/01/2018
Material Type									Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	**LOR**	**HSL Intrusive Maintenance Worker 0 to <2 m[1]**	**CLAY HSL A/B 0 to <1 m²**	**CLAY HSL A/B 1 to <2 m²**	**CLAY HSL A/B 2 to <4 m²**	**CLAY HSL D 0 to <1 m³**	**CLAY HSL D 1 to <2 m³**	**CLAY HSL D 2 to <4 m³**														
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 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	< 0.3
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

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QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID									MW2-0.5	QS2	RPD%	QS2A	RPD%	MW2-1.0	MW3-0.2	MW3-0.5	QS3	RPD%	QS3A	RPD%	TP1-0.2	TP1-0.5	QS4	RPD%	QS4A	RPD%
Sample Date									9/01/2018					9/01/2018	10/01/2018	10/01/2018					11/01/2018	11/01/2018				
Material Type									Fill					Fill	Fill	Fill					Fill	Fill				
Compounds	**LOR**	**HSL Intrusive Maintenance Worker 0 to <2 m[1]**	**CLAY HSL A/B 0 to <1 m[2]**	**CLAY HSL A/B 1 to <2 m[2]**	**CLAY HSL A/B 2 to <4 m[2]**	**CLAY HSL D 0 to <1 m[3]**	**CLAY HSL D 1 to <2 m[3]**	**CLAY HSL D 2 to <4 m[3]**																		
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5	< 0.5	0%	< 1	0%
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20	< 20	0%	< 10	0%
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50	< 50	0%	< 50	0%

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID									TP2-0.2	TP2-0.4	TP3-0.5	TP4-0.3	TP4-0.6	TP5-0.2	TP6-0.2	TP6-1.0	TP7-1.5	TP8-0.5	QS6	RPD%	QS6A	RPD%	TP8-1.5	TP9-0.2
Sample Date									11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018					11/01/2018	12/01/2018
Material Type									Fill	Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill					Fill	Fill
Compounds	**LOR**	**HSL Intrusive Maintenance Worker 0 to <2 m^1**	**CLAY HSL A/B 0 to <1 m^2**	**CLAY HSL A/B 1 to <2 m^2**	**CLAY HSL A/B 2 to <4 m^2**	**CLAY HSL D 0 to <1 m^3**	**CLAY HSL D 1 to <2 m^3**	**CLAY HSL D 2 to <4 m^3**																
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1	< 0.1
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1	< 0.1
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3	< 0.3
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 1	0%	< 0.5	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	0%	< 10	0%	< 20	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	0%	< 50	0%	< 50	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Sample ID									TP9-0.5	TP11-0.3	TP12-0.2	TP13-0.2	TP13-0.5	TP14-0.4	TP15-0.3	TP15-1.2	TP16-0.4	TP17-0.2	TP17-0.5	TP18-0.7	TP18-1.2
Sample Date									12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type									Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	LOR	HSL Intrusive Maintenance Worker 0 to <2 m^1	CLAY HSL A/B 0 to <1 m^2	CLAY HSL A/B 1 to <2 m^2	CLAY HSL A/B 2 to <4 m^2	CLAY HSL D 0 to <1 m^3	CLAY HSL D 1 to <2 m^3	CLAY HSL D 2 to <4 m^3													
Benzene	0.1	350	0.7	1	2	4	6	9	< 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	0.1	NL	480	NL	NL	NL	NL	NL	< 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	0.1	NL	NL	NL	NL	NL	NL	NL	< 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
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 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	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TABLE 3:
SUMMARY OF SOIL ANALYTICAL RESULTS -
SOIL HEALTH SCREENING LEVELS FOR VAPOUR INTRUSION
170 Reservoir Road, Arndell Park, NSW

Sample ID									TP19-0.3	QS8	RPD%	QS8A	RPD%	TP20-0.3
Sample Date									12/01/2018					12/01/2018
Material Type									Natural					Fill
Compounds	LOR	HSL Intrusive Maintenance Worker 0 to <2 m^3	CLAY HSL A/B 0 to <1 m^2	CLAY HSL A/B 1 to <2 m^2	CLAY HSL A/B 2 to <4 m^2	CLAY HSL D 0 to <1 m^3	CLAY HSL D 1 to <2 m^3	CLAY HSL D 2 to <4 m^3						
Benzene	0.1	350	0.7	1	2	4	6	9	< 0.1	< 0.1	0%	< 0.2	0%	< 0.1
Toluene	0.1	NL	480	NL	NL	NL	NL	NL	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1
Ethylbenzene	0.1	NL	NL	NL	NL	NL	NL	NL	< 0.1	< 0.1	0%	< 0.5	0%	< 0.1
Xylenes	0.3	NL	110	310	NL	NL	NL	NL	< 0.3	< 0.3	0%	< 0.5	0%	< 0.3
Naphthalene	0.5	NL	5	NL	NL	NL	NL	NL	< 0.5	< 0.5	0%	< 1	0%	< 0.5
C6 - C10 Fraction F1	20	NL	50	90	150	310	480	NL	< 20	< 20	0%	< 10	0%	< 20
>C10 - C16 Fraction F2	50	NL	280	NL	NL	NL	NL	NL	< 50	< 50	0%	< 50	0%	< 50

Notes:

All units are in mg/kg unless otherwise noted

F1 Fraction denotes TRH C_6-C_{10} fraction minus BTEX compounds

F2 Fraction denotes TRH >C_{10}-C_{16} minus naphthalene

Only sample results analysed for the COPCs on this table are included

1. CRC CARE 2011 Health Screening Level for Vapour Intrusion - Intrusive Maintenance Worker, Clay
2. NEPM 2013 Health Screening Level for Vapour Intrusion - Low-high density residential, Clay
3. NEPM 2013 Health Screening Level for Vapour Intrusion - recreational/open space, Clay

LOR - Limits of Reporting

NL - Not Limiting

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH1-0.2	BH1-0.5	BH2-2.0	BH3-0.5	BH3-2.0	BH3-3.0	BH4-0.2	BH4-0.5	QS1	RPD%	QS1A	RPD%	BH4-2.0	BH5-0.2	BH5-1.0	BH5-2.0	BH6-0.2	BH6-0.5	BH7-0.2	BH7-0.5	BH8-0.2	BH8-0.6
Sample Date					8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018				8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type					Fill	Natural	Natural	Fill	Fill	Natural	Fill	Fill					Fill	Fill	Fill	Natural	Fill	Natural	Natural	Natural	Fill	Fill
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	NE	NE	**0.7**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	**4**	**3**	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	**400**	**300**	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

LOR - Limits of Reporting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

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<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH8-1.2	BH9-0.2	BH9-0.8	BH9-2.6	BH10-0.2	BH10-2.0	BH11-0.5	BH11-1.5	BH11-2.7	BH12-0.5	BH12-2.1	BH13-0.2	BH13-0.5	BH13-1.0	BH14-0.2	BH14-0.5	BH15-0.2	BH15-0.8	BH15-1.5	BH16-0.2	BH16-1.5	BH17-0.2
Sample Date					9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type					Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Fill	Natural	Fill	Fill	Natural	Fill	Fill	Fill
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	**4**	**3**	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	**400**	**300**	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

LOR - Limits of Reporting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH17-0.5	BH17-1.0	BH18-0.2	BH18-0.5	BH18-1.0	BH19-0.2	BH19-0.5	BH20-0.3	BH20-0.8	BH21-0.2	BH21-0.5	BH21-1.0	BH22-0.4	BH22-1.2	BH23-0.3	BH23-1.2	BH23-2.3	BH24-0.2	BH24-0.5	BH24-1.2	BH25-0.5	BH25-1.0
Sample Date					9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type					Fill	Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	**4**	**3**	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	**400**	**300**	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	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

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QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH26-0.3	BH26-0.8	BH26-2.5	BH27-0.4	BH27-1.5	MW1-0.2	MW1-0.5	MW2-0.2	MW2-0.5	QS2	RPD%	QS2A	RPD%	MW2-1.0	MW3-0.2	MW3-0.5	QS3	RPD%	QS3A	RPD%	MW3-1.1	TP1-0.2
Sample Date					10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018				9/01/2018	10/01/2018	10/01/2018					10/01/2018	11/01/2018
Material Type					Fill	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Fill	Fill				Fill	Fill	Fill					Natural	Fill
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Acenaphthylene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benz(a)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benzo(a)pyrene	0.5	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%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benzo(b&j)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Chrysene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Fluorene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Naphthalene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Phenanthrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	4	3	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5
Total PAH	0.5	400	300	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

LOR - Limits of Reporting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					TP1-0.5	QS4	RPD%	QS4A	RPD%	TP1-1.0	TP2-0.2	TP2-0.4	TP2-1.0	TP3-0.2	TP3-0.5	TP4-0.3	TP4-0.6	TP5-0.2	TP5-0.6	TP6-0.2	TP6-0.5	TP6-1.0	TP6-2.6	TP7-0.5	TP7-1.5	TP8-0.2
Sample Date					11/01/2018					11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018
Material Type					Fill					Natural	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Fill	Fill
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	**0.7**	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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-cd)pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	**4**	**3**	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	**400**	**300**	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

LOR - Limits of Reporting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					TP8-0.5	QS6	RPD%	QS6A	RPD%	TP8-1.5	TP9-0.2	TP9-0.5	TP9-1.2	TP11-0.3	TP11-1.0	TP12-0.2	TP12-1.2	TP13-0.2	TP13-0.5	TP13-1.0	TP13-2.0	TP14-0.4	TP14-1.0	TP15-0.3	TP15-1.2	TP15-2.5
Sample Date					11/01/2018					11/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type					Fill					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Natural
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																						
Acenaphthene	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	**0.7**	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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-cd)pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 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	0.5	NE	NE	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	**4**	**3**	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH	0.5	**400**	**300**	NE	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

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QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

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TRACE ENVIRONMENTAL

TABLE 4:
SUMMARY OF SOIL ANALYTICAL RESULTS
POLYCYCLIC AROMATIC HYDROCARBONS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					TP16-0.4	TP16-1.3	TP17-0.2	TP17-0.5	TP17-1.0	TP18-0.2	TP18-0.7	TP18-1.2	TP19-0.3	QS8	RPD%	QS8A	RPD%	TP19-0.6	TP20-0.3	TP20-0.9
Sample Date					12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018					12/01/2018	12/01/2018	12/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural					Natural	Fill	Natural
Compounds	**LOR**	**HIL B**	**HIL C**	**ESL[1]**																
Acenaphthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	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%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Chrysene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Fluorene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Pyrene	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (lower bound)	0.5	4	3	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5
Total PAH	0.5	400	300	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0%	< 0.5	0%	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreatinal Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table 1B (6) - Urban residential and public open space, Fine soils

LOR - Limits of Reporting

NE - Not Established

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH1-0.2	BH1-0.5	BH2-0.2	BH2-2.0	BH3-0.2	BH3-0.5	BH3-2.0	BH3-3.0	BH4-0.2	BH4-0.5	QS1	RPD%	QS1A	RPD%	BH4-1.0	BH4-2.0	BH5-0.2	BH5-1.0	BH5-2.0	BH6-0.2
Sample Date					8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018					8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018
Material Type					Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural	Fill	Fill					Fill	Fill	Fill	Fill	Natural	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																				
Arsenic	2	500	300	100	3.9	3.3	-	8.5	-	5	21	4.3	11	3.3	7.9	82%	6	58%	-	9.6	7.1	5.7	8.5	6.9
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	-	< 0.4	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 1	-	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	19	7.7	-	15	-	14	52	10	22	16	44	93%	15	6%	-	20	20	13	22	19
Copper	5	30,000	17,000	230	34	26	-	39	-	16	34	42	26	24	37	43%	28	15%	-	25	14	46	31	14
Lead	5	1,200	600	1,100	19	12	-	18	-	24	40	22	51	10	24	82%	28	95%	-	13	23	19	13	16
Mercury	0.1	120	80	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	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	22	5.8	-	20	-	8.8	22	16	13	19	48	87%	11	53%	-	8.1	11	45	12	9.3
Zinc	5	60,000	30,000	750	95	39	-	73	-	65	84	56	110	84	82	2%	62	30%	-	43	53	110	54	35
pH (aqueous)	0.1 pH units	-	-	-	-	-	5.6	-	-	-	-	-	-	9	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	480	-	54	-	-	-	-	-	-	100	-	-	-	-	-	-	-	-	-	-
% Clay	1%	-	-	-	26	-	-	-	-	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	5.2	-	-	-	-	-	-	-	-	7.8	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	1	-	-	-	-	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	6.6	-	-	-	-	-	-	-	-	3.4	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	22	-	-	-	-	-	-	-	-	18	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	-	ND/NRFD	-	ND/NRFD	-	ND/NRFD	-	0.00016% AF, Chr NRFD	ND/NRFD	ND/NRFD	-	-	-	0.0039% AF + FA, Chr NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (1) to (5) - Urban residential and public open space, Fine soils

EILs for Cr, Cu, Pb, Ni and Zn calculated based on NEPM 2013 methodology and based on based on average soil properties of pH, % clay, CEC, % Fe and Organic Carbon Content

LOR - Limits of Reporting

NE - Not Established

FA - Fibrous Asbestos

Chr - Chrysotile Asbestos

Am - Amosite Asbestos

Cr - Crocidolite Asbestos

ND - No Asbestos Detected at reporting limit of 0.001% w/w

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

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QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH6-0.5	BH7-0.2	BH7-0.5	BH8-0.2	BH8-0.6	BH8-1.2	BH9-0.2	BH9-0.8	BH9-2.6	BH10-0.2	BH10-2.0	BH11-0.5	BH11-1.5	BH11-2.7	BH12-0.2	BH12-0.5	BH12-2.1	BH13-0.2	BH13-0.5
Sample Date					8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type					Natural	Natural	Natural	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Fill	Natural	Fill	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																			
Arsenic	2	500	300	100	6.3	3.6	12	3.1	12	8.4	12	9.7	8.1	5.7	3.5	8.8	59	19	-	6.6	17	9.8	8.3
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	22	9.9	35	9.6	34	21	19	24	17	14	34	15	9.1	36	-	11	17	11	16
Copper	5	30,000	17,000	230	23	10	16	7.3	23	21	13	44	36	20	31	39	30	19	-	37	13	32	23
Lead	5	1,200	600	1,100	17	17	23	10	23	17	20	24	17	19	16	21	25	21	-	20	8.9	20	15
Mercury	0.1	120	80	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	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	7	7.3	12	8.1	13	7.9	9.9	20	13	7.9	38	18	22	15	-	25	< 5	15	8.9
Zinc	5	60,000	30,000	750	36	38	20	29	42	31	40	85	43	45	81	80	130	42	-	74	19	75	33
pH (aqueous)	0.1 pH units	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	6.5	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	-	44	-	40	-	-	-	-	-	-	-	-	-	-	-	15	-	-	-
% Clay	1%	-	-	-	-	-	-	3.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	-	ND/NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD	-	0.12% Chr + Cr NRFD	ND/NRFD	-	ND/NRFD	-	-	ND/NRFD	-	-	-	ND/NRFD

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (1) to (5) - Urban residential and public open space, Fine soils

EILs for Cr, Cu, Pb, Ni and Zn calculated based on NEPM 2013 methodology and based on based on average soil properties of pH, % clay, CEC, % Fe and Organic Carbon Content

LOR - Limits of Reporting

NE - Not Established

FA - Fibrous Asbestos

Chr - Chrysotile Asbestos

Am - Amosite Asbestos

Cr - Crocidolite Asbestos

ND - No Asbestos Detected at reporting limit of 0.001% w/w

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH13-1.0	BH14-0.2	BH14-0.5	BH15-0.2	BH15-0.8	BH15-1.5	BH16-0.2	BH16-1.5	BH17-0.2	BH17-0.5	BH17-1.0	BH18-0.2	BH18-0.5	BH18-1.0	BH19-0.2	BH19-0.5	BH20-0.3	BH20-0.8	BH21-0.2
Sample Date					9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type					Fill	Fill	Natural	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																			
Arsenic	2	500	300	100	7.2	5.4	5.1	4.3	3.6	9.9	7.3	9.6	8.3	8.1	9.9	16	11	8.4	4.6	5.6	9.7	9.1	9.1
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	23	15	12	7.2	8.1	19	17	6.6	18	18	13	27	14	13	12	13	11	15	16
Copper	5	30,000	17,000	230	12	8.3	7	7.4	21	23	13	20	18	31	28	14	34	44	9.4	37	32	32	12
Lead	5	1,200	600	1,100	20	18	16	14	12	9.9	20	14	22	33	7.3	25	26	17	20	24	17	21	20
Mercury	0.1	120	80	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	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	6.8	5	5	< 5	15	13	8.9	14	12	24	11	11	24	32	6.5	41	11	28	7.6
Zinc	5	60,000	30,000	750	16	28	18	39	76	57	71	78	58	94	53	62	97	89	34	96	62	96	48
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	-	ND/NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD	-	ND/NRFD	-	ND/NRFD	ND/NRFD	ND/NRFD	-	ND/NRFD	ND/NRFD	ND/NRFD	-	ND/NRFD

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

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1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (1) to (5) - Urban residential and public open space, Fine soils

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High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

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TRACE ENVIRONMENTAL

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID					BH21-0.5	BH21-1.0	BH22-0.4	BH22-1.2	BH23-0.3	BH23-1.2	BH23-2.3	BH24-0.2	BH24-0.5	BH24-1.2	BH25-0.2	BH25-0.5	BH25-1.0	BH26-0.3	BH26-0.8	BH26-2.5	BH27-0.4	BH27-0.8
Sample Date					10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																		
Arsenic	2	500	300	100	17	19	7.6	10	9.7	7.5	7.4	14	5.7	17	-	27	24	15	6.4	9.7	11	-
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-
Chromium (Total)	5	500	300	490	8.4	28	18	9.1	15	14	15	19	8.6	10	-	11	11	12	7.7	7.2	9.5	-
Copper	5	30,000	17,000	230	43	20	27	30	27	37	18	27	32	39	-	54	48	64	24	35	35	-
Lead	5	1,200	600	1,100	23	38	28	20	51	27	24	32	21	28	-	24	26	28	18	16	30	-
Mercury	0.1	120	80	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	< 0.1	< 0.1	< 0.1	-
Nickel	5	1,200	1,200	250	18	8.1	27	24	20	28	11	19	23	13	-	35	35	18	7.4	23	24	-
Zinc	5	60,000	30,000	750	78	39	81	87	95	98	51	77	77	72	-	89	89	110	33	55	86	-
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	-	-	-	8.2	-	-	-	-	8.4	-	-	-	-	-	8.5
Electrical Conductivity	5 µS/cm	-	-	-	-	86	-	-	-	-	130	-	-	-	-	88	-	-	-	-	-	93
% Clay	1%	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	6.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	-	ND/NRFD	-	-	ND/NRFD	0.13% Chr + Am, 0.00073% AF Chr + Am NRFD	ND/NRFD	-	-	ND/NRFD	ND/NRFD	-	ND/NRFD	-	-	ND/NRFD	-

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (1) to (5) - Urban residential and public open space, Fine soils

EILs for Cr, Cu, Pb, Ni and Zn calculated based on NEPM 2013 methodology and based on based on average soil properties of pH, % clay, CEC, % Fe and Organic Carbon Content

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NE - Not Established

FA - Fibrous Asbestos

Chr - Chrysotile Asbestos

Am - Amosite Asbestos

Cr - Crocidolite Asbestos

ND - No Asbestos Detected at reporting limit of 0.001% w/w

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QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

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QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH27-1.5	MW1-0.2	MW1-0.5	MW2-0.2	MW2-0.5	QS2	RPD%	QS2A	RPD%	MW2-1.0	MW3-0.2	MW3-0.5	QS3	RPD%	QS3A	RPD%	MW3-1.1	TP1-0.2
Sample Date					10/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018					9/01/2018	10/01/2018	10/01/2018	10/01/2018				10/01/2018	11/01/2018
Material Type					Fill	Fill	Natural	Fill	Fill					Fill	Fill	Fill					Natural	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																		
Arsenic	2	500	300	100	10	13	20	3.7	7.5	5.8	26%	< 5	100%	7.9	3.4	15	14	7%	10	40%	25	8.7
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 1	-	< 0.4	< 0.4	< 0.4	< 0.4	-	< 1	-	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	11	30	41	15	10	11	10%	7	35%	20	8.6	19	22	15%	17	11%	23	17
Copper	5	30,000	17,000	230	33	23	28	42	38	32	17%	33	14%	36	5.3	21	12	55%	12	55%	32	15
Lead	5	1,200	600	1,100	16	43	62	19	22	19	15%	20	10%	23	15	22	22	0%	22	0%	19	51
Mercury	0.1	120	80	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	< 0.1
Nickel	5	1,200	1,200	250	23	9.6	15	31	18	19	5%	16	12%	26	< 5	18	11	48%	11	48%	30	7.8
Zinc	5	60,000	30,000	750	73	61	89	87	64	67	5%	54	17%	87	26	61	29	71%	31	65%	80	90
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	-	-	-	95	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	ND/NRFD	-	-	ND/NRFD	ND/NRFD	-	-	-	ND/NRFD	ND/NRFD	ND/NRFD	-	-	-	-	-	ND/NRFD

Notes:

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<50% RPD (Organic)

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SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Sample ID					TP1-0.5	QS4	RPD%	QS4A	RPD%	TP1-1.0	TP2-0.2	TP2-0.4	TP2-1.0	TP3-0.2	TP3-0.5	TP4-0.3	TP4-0.6	TP5-0.2	TP5-0.6	TP6-0.2	TP6-0.5	TP6-1.0	TP6-2.6
Sample Date					11/01/2018					11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018
Material Type					Fill					Natural	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill	Natural	Fill	Fill	Fill	Natural
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																			
Arsenic	2	500	300	100	8.3	7.7	8%	8	4%	15	11	6.9	6.6	8.2	15	24	7.8	6.2	12	4.6	13	12	11
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	-	< 1	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	15	14	7%	13	14%	20	36	18	20	17	29	26	18	16	27	10	35	41	21
Copper	5	30,000	17,000	230	38	34	11%	36	5%	26	22	48	23	11	18	33	46	25	20	16	54	54	23
Lead	5	1,200	600	1,100	28	30	7%	24	15%	47	41	40	20	38	33	130	21	96	19	33	39	41	21
Mercury	0.1	120	80	NE	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	18	17	6%	18	0%	12	16	18	13	8.6	11	12	14	10	8	7	37	44	16
Zinc	5	60,000	30,000	750	80	66	19%	70	13%	49	91	120	45	58	44	190	130	130	31	67	110	120	47
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	ND/NRFD	-	-	-	-	ND/NRFD	0.27% Chr NRFD	-	ND/NRFD	ND/NRFD	1.5% Chr + Am NRFD	-	0.002% FA, Chr NRFD	-	-	ND/NRFD	2.2% Chr + Am NRFD	-

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

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QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Sample ID					TP7-0.5	TP7-1.5	TP8-0.2	TP8-0.5	QS6	RPD%	QS6A	RPD%	TP8-1.5	TP9-0.2	TP9-0.5	TP9-1.2	TP10-0.2	TP11-0.3	TP11-1.0	TP12-0.2	TP12-1.2	TP13-0.2	TP13-0.5
Sample Date					11/01/2018	11/01/2018	11/01/2018	11/01/2018					11/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type					Fill	Fill	Fill	Fill					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**																			
Arsenic	2	500	300	100	6.4	8.1	9.5	9.5	9	5%	8	17%	6.5	9.1	5.6	5.8	-	7.3	8.5	9.4	27	5.2	4.7
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	-	< 1	-	< 0.4	< 0.4	< 0.4	< 0.4	-	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	15	15	15	14	11	24%	12	15%	25	13	11	< 5	-	12	13	15	9.5	11	8.6
Copper	5	30,000	17,000	230	29	24	20	34	26	27%	36	6%	33	20	45	7.7	-	30	40	18	37	11	25
Lead	5	1,200	600	1,100	26	19	31	34	26	27%	23	39%	23	34	27	6.5	-	31	30	26	21	21	22
Mercury	0.1	120	80	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	0.2	< 0.1	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	17	17	12	25	20	22%	24	4%	56	9	24	< 5	-	18	22	11	21	7	7.6
Zinc	5	60,000	30,000	750	67	60	73	85	68	22%	85	0%	120	85	76	12	-	92	93	67	69	49	42
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.5
Electrical Conductivity	5 µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90	-	-	-	-	43
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	0.017% Chr + Am NRFD	-	ND/NRFD	ND/NRFD	-	-	-	-	ND/NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD	ND/NRFD

Notes:

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170 Reservoir Road, Arndell Park, NSW

Sample ID					TP13-1.0	TP13-2.0	TP14-0.4	TP14-1.0	TP15-0.3	TP15-1.2	TP15-2.5	TP16-0.4	TP16-1.3	TP17-0.2	TP17-0.5	TP17-1.0	TP18-0.2	TP18-0.7	TP18-1.2
Sample Date					12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type					Fill	Natural	Fill	Natural	Fill	Fill	Natural	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**															
Arsenic	2	500	300	100	17	4.5	27	8.8	11	8.4	9.4	13	6.3	11	11	12	5.1	10	17
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	18	14	10	12	17	16	18	9	18	17	14	16	11	13	21
Copper	5	30,000	17,000	230	38	6.1	38	35	20	38	18	26	19	20	61	55	11	51	20
Lead	5	1,200	600	1,100	18	15	20	19	37	58	24	15	16	32	30	29	26	42	14
Mercury	0.1	120	80	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	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	21	< 5	11	23	12	30	6.5	6.5	7.4	13	55	39	9.1	16	10
Zinc	5	60,000	30,000	750	73	7.1	61	72	95	93	27	45	23	79	120	120	79	78	38
pH (aqueous)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	-	-	ND/NRFD	-	ND/NRFD	ND/NRFD	-	ND/NRFD	-	ND/NRFD	ND/NRFD	-	-	ND/NRFD	ND/NRFD

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QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TABLE 5:
SUMMARY OF SOIL ANALYTICAL RESULTS:
HEAVY METALS, ASBESTOS AND PHYSICAL PARAMETERS
170 Reservoir Road, Arndell Park, NSW

Sample ID					TP19-0.3	QS8	RPD%	QS8A	RPD%	TP19-0.6	TP20-0.3	TP20-0.9
Sample Date					12/01/2018					12/01/2018	12/01/2018	12/01/2018
Material Type					Natural					Natural	Fill	Natural
Metal	**LOR**	**HIL B**	**HIL C**	**EIL[1]**								
Arsenic	2	500	300	100	7.2	6.6	9%	< 5	97%	5.8	8.9	10
Cadmium	0.4	150	90	NE	< 0.4	< 0.4	-	< 1	-	< 0.4	< 0.4	< 0.4
Chromium (Total)	5	500	300	490	23	15	42%	9	88%	19	49	23
Copper	5	30,000	17,000	230	8.8	8	10%	6	38%	42	24	25
Lead	5	1,200	600	1,100	21	21	0%	12	55%	16	22	19
Mercury	0.1	120	80	NE	< 0.1	< 0.1	-	< 0.1	-	< 0.1	< 0.1	< 0.1
Nickel	5	1,200	1,200	250	5.8	< 5	80%	3	64%	30	35	9.4
Zinc	5	60,000	30,000	750	19	16	17%	10	62%	90	53	38
pH (aqueous)	0.1 pH units	-	-	-	7.5	-	-	-	-	-	-	-
Electrical Conductivity	5 µS/cm	-	-	-	57	-	-	-	-	-	-	-
% Clay	1%	-	-	-	-	-	-	-	-	-	-	-
pH ($CaCl_2$)	0.1 pH units	-	-	-	-	-	-	-	-	-	-	-
Total Organic Carbon	0.1%	-	-	-	-	-	-	-	-	-	-	-
% Iron	0.01%	-	-	-	-	-	-	-	-	-	-	-
Cation Exchange Capacity	0.05 meq/100g	-	-	-	-	-	-	-	-	-	-	-
Asbestos	0.001%	0.04%; 0.001% FA/AF	0.02%; 0.001% FA/AF	-	ND/NRFD	-	-	-	-	-	0.00084%, FA Chr + Am + Cr NRFD	-

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Tables 1B (1) to (5) - Urban residential and public open space, Fine soils

EILs for Cr, Cu, Pb, Ni and Zn calculated based on NEPM 2013 methodology and based on based on average soil properties of pH, % clay, CEC, % Fe and Organic Carbon Content

LOR - Limits of Reporting

NE - Not Established

FA - Fibrous Asbestos

Chr - Chrysotile Asbestos

Am - Amosite Asbestos

Cr - Crocidolite Asbestos

ND - No Asbestos Detected at reporting limit of 0.001% w/w

NRFD - No Respirable Fibres Detected

QS-1 and QS-1A - Duplicate/Triplicate Samples of BH4_0.5

QS-2 and QS-2A - Duplicate/Triplicate Samples of MW2_0.5

QS-3 and QS-3A - Duplicate/Triplicate Samples of MW3_0.5

QS-4 and QS-4A - Duplicate/Triplicate Samples of TP1_0.5

QS-6 and QS-6A - Duplicate/Triplicate Samples of TP8_0.5

QS-8 and QS-8A - Duplicate/Triplicate Samples of TP19_0.3

High RPDs are shaded. Acceptable RPDs for each LOR multiplier range are:

No Limit (<10 x LOR)

<30% RPD (Inorganic)

<50% RPD (Organic)

TRACE ENVIRONMENTAL

Paynter Dixon Constructions Pty Ltd

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH1-0.2	BH2-0.2	BH2-0.5	BH3-0.5	BH4-0.2	BH5-0.2	BH6-0.2	BH7-0.2	BH8-0.6
Sample Date					8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Aroclor-1016	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB	0.5	1	1	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH9-0.2	BH10-0.2	BH11-0.5	BH12-0.2	BH12-1.0	BH13-0.2	BH14-0.2	BH15-0.8	BH16-0.2
Sample Date					9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Aroclor-1016	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1242	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1248	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1254	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1260	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PCB	0.5	1	1	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH17-0.2	BH17-0.5	BH18-0.2	BH19-0.2	BH20-0.3	BH21-0.2	BH22-0.4	BH23-0.3	BH24-0.2
Sample Date					9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.05	< 0.05	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Aroclor-1016	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	NE	NE	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	1	1	NE	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					BH25-0.2	BH26-0.3	BH27-0.4	MW1-0.2	MW2-0.2	MW3-0.2	TP1-0.2	TP2-0.4	TP3-0.2
Sample Date					10/01/2018	10/01/2018	10/01/2018	8/01/2018	9/01/2018	10/01/2018	11/01/2018	11/01/2018	11/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.2	< 0.2	< 0.2	< 0.05	< 0.05	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Aroclor-1016	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	1	1	NE	< 0.5	< 0.5	< 0.5	< 0.1	< 0.1	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					TP4-0.3	TP5-0.2	TP6-0.2	TP7-0.2	TP8-0.2	TP9-0.2	TP10-0.2	TP11-0.3	TP12-0.2
Sample Date					11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**									
Aroclor-1016	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	1	1	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TABLE 6:
SUMMARY OF SOIL ANALYTICAL RESULTS
- OCPs, OPPs and PCBs
170 Reservoir Road, Arndell Park, NSW

Sample ID					TP13-0.2	TP14-0.4	TP15-0.3	TP16-0.4	TP17-0.2	TP18-0.2	TP19-0.3	TP20-0.3
Sample Date					12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type					Fill	Fill	Fill	Fill	Fill	Fill	Natural	Fill
OCP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**								
4.4'-DDD	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	600	400	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	600	400	180	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordanes - Total	0.1	90	70	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
d-BHC	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	400	340	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	20	20	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	10	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	NE	NE	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	15	10	NE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	500	400	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	30	30	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
OPP	**LOR**	**HIL B**	**HIL C**	**EIL[1]**								
Azinphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	340	250	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton-O	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-S	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Naled	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	NE	NE	NE	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	NE	NE	NE	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
PCB	**LOR**	**HIL B**	**HIL C**	**EIL[1]**								
Aroclor-1016	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	NE	NE	NE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	NE	NE	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB	0.5	1	1	NE	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

1. NEPM 2013, Sch B1 Ecological Investigation Levels and Environmental Screening Levels, Table (5) - Urban residential and public open space

LOR - Limits of Reporting

NE - Not Established

TRACE ENVIRONMENTAL

TABLE 7:
SUMMARY OF SOIL ANALYTICAL RESULTS - Phenols
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

SampleID				BH1-0.2	BH3-0.5	BH5-1.0	BH8-0.2	BH9-2.6	BH11-0.5	BH13-1.0	BH15-0.8	BH17-0.5	BH18-0.2	BH20-0.3	BH22-0.4	BH24-0.5
Sample Date				8/01/2018	8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018
Material Type				Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Phenols	**LOR**	**HIL B**	**HIL C**													
2.4.5-Trichlorophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4-Dichlorophenol	0.5	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
2.6-Dichlorophenol	0.5	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
2-Chlorophenol	0.5	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
4-Chloro-3-methylphenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Pentachlorophenol	1	**130**	**120**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Halogenated Phenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	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
2.4-Dinitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Cyclohexyl-4.6-dinitrophenol	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	**4700**	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
2-Nitrophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3&4-Methylphenol (m&p-Cresol)	0.4	**4700**	**4000**	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dinoseb	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Phenol	0.5	**45000**	**40000**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

LOR - Limits of Reporting

NE - Not Established

TRACE ENVIRONMENTAL

TABLE 7:
SUMMARY OF SOIL ANALYTICAL RESULTS - Phenols
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

SampleID				BH26-0.3	MW2-0.5	MW3-0.5	TP1-0.2	TP2-0.4	TP4-0.3	TP6-1.0	TP8-0.5	TP9-0.5	TP13-0.2	TP15-0.3	TP17-0.2	TP18-0.7
Sample Date				10/01/2018	9/01/2018	10/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	11/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018	12/01/2018
Material Type				Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Phenols	**LOR**	**HIL B**	**HIL C**													
2.4.5-Trichlorophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4-Dichlorophenol	0.5	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
2.6-Dichlorophenol	0.5	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
2-Chlorophenol	0.5	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
4-Chloro-3-methylphenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Pentachlorophenol	1	**130**	**120**	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Halogenated Phenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	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
2.4-Dinitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Cyclohexyl-4.6-dinitrophenol	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	**4700**	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
2-Nitrophenol	1	NE	NE	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
3&4-Methylphenol (m&p-Cresol)	0.4	**4700**	**4000**	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	NE	NE	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Dinoseb	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Phenol	0.5	**45000**	**40000**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol	20	NE	NE	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

LOR - Limits of Reporting

NE - Not Established

TRACE ENVIRONMENTAL

TABLE 8:
SUMMARY OF SOIL ANALYTICAL RESULTS - HERBICIDES
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

SampleID				BH1-0.2	BH5-0.2	BH9-0.2	BH10-0.2	BH13-0.2	BH16-0.2	BH18-0.2	BH23-0.3	BH25-0.2	BH27-0.4	MW3-0.2	TP10-0.2	TP20-0.3
Sample Date				8/01/2018	8/01/2018	9/01/2018	9/01/2018	9/01/2018	9/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	10/01/2018	12/01/2018	12/01/2018
Material Type				Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill	Fill
Herbicides	**LOR**	**HIL B**	**HIL C**													
2.4.5-T	0.5	**900**	**800**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-TP	0.5	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
2.4-D	0.5	**1600**	**1300**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2.4-DB	0.5	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
Actril (loxynil)	0.5	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
Dicamba	0.5	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
Dichlorprop	0.5	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
Dinitro-o-cresol	0.5	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
Dinoseb	0.5	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
MCPA	0.5	**900**	**800**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
MCPB	0.5	**900**	**800**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Mecoprop	0.5	**900**	**800**	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

Notes:

All units are in mg/kg unless otherwise noted

HIL B - NEPM 2013 Health Investigation Levels for Medium/High Density Residential with minimal access to soil

HIL C - NEPM 2013 Health Investigation Levels for Open Parks/Recreational Areas

LOR - Limits of Reporting

NE - Not Established

TRACE ENVIRONMENTAL

TABLE 9:
SUMMARY OF TRIP BLANK, TRIP SPIKE AND RINSATE ANALYTICAL DATA
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID		TB1 (Trip Blank)	TS1 (Trip Spike)	TB1 (Trip Blank)	TS1 (Trip Spike)	WTB1 (Trip Blank) mg/L	WTS1 (Trip Spike) mg/L	RB1 (Rinsate - mg/L)	RB2 (Rinsate - mg/L)	RB3 (Rinsate - mg/L)	RB4 (Rinsate - mg/L)	RB5 (Rinsate - mg/L)
Sample Date		9/01/2018	9/01/2018	12/01/2018	12/01/2018	17/01/2018	17/01/2018	8/01/2018	9/01/2018	10/01/2018	11/01/2018	12/01/2018
Compounds	**LOR (mg/kg)**											
Benzene	0.1	<0.1	91%	<0.1	92%	<0.001	86%	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	0.1	<0.1	92%	<0.1	94%	<0.001	100%	<0.001	<0.001	<0.001	<0.001	<0.001
Ethylbenzene	0.1	<0.1	94%	<0.1	93%	<0.001	87%	<0.001	<0.001	<0.001	<0.001	<0.001
meta- & para-Xylene	0.2	<0.2	94%	<0.2	90%	<0.002	83%	<0.002	<0.002	<0.002	<0.002	<0.002
ortho-Xylene	0.1	<0.1	92%	<0.1	92%	<0.001	99%	<0.001	<0.001	<0.001	<0.001	<0.001
Total Xylenes	0.3	<0.3	93%	<0.3	91%	<0.003	88%	<0.003	<0.003	<0.003	<0.003	<0.003
Naphthalene	0.5	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01
C6 - C9 Fraction	20	<20	99%	<20	100%	<0.02	77%	<0.02	<0.02	<0.02	<0.02	<0.02
C10 - C14 Fraction	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
C15 - C28 Fraction	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
C29 - C36 Fraction	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
C10 - C36 Fraction (sum)	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
C6 - C10 Fraction	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02
C6 - C10 Fraction F1	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02
>C10 - C16 Fraction	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
>C16 - C34 Fraction	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
>C34 - C40 Fraction	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
>C10 - C16 Fraction F2	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
PAHs	**LOR (mg/kg)**											
Acenaphthene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Acenaphthylene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Anthracene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(a)pyrene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(b&j)fluoranthene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(g.h.i)perylene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Benzo(k)fluoranthene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Chrysene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Dibenz(a.h)anthracene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Fluoranthene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Fluorene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Indeno(1.2.3-cd)pyrene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Naphthalene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Phenanthrene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Pyrene	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Total PAH*	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Metals	**LOR (mg/kg)**											
Arsenic	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	-	-	-	-	-	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium (Total)	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	**0.001**	<0.001
Copper	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Lead	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005

TRACE ENVIRONMENTAL

TABLE 10
SUMMARY OF GROUNDWATER ANALYTICAL DATA
170 Reservoir Road, Arndell Park, NSW

Paynter Dixon Constructions Pty Ltd

Sample ID						MW1	MW2	MW3	QW-1	RPD	QW-1A	RPD
Sample Date						17/01/18	17/01/18	17/01/18				
Compounds	**LOR**	**NEPM 2013 Drinking Water GIL[1]**	**NEPM 2013 Freshwater GIL[2]**	**NEPM 2013 SAND HSL HSL A/B**	**NEPM 2013 SAND HSL HSL C**							
BTEXN												
Benzene	0.001	**0.001**	**950**	**0.8**	**NL**	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Toluene	0.001	**0.8**	NE	**NL**	**NL**	<0.001	<0.001	<0.001	<0.001	0%	<0.002	0%
Ethylbenzene	0.001	**0.3**	NE	**NL**	**NL**	<0.001	<0.001	<0.001	<0.001	0%	<0.002	0%
meta- & para-Xylene	0.002	NE	**200**	NE	NE	<0.002	<0.002	<0.002	<0.002	0%	<0.002	0%
ortho-Xylene	0.001	NE	**350**	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.002	0%
Total Xylenes	0.003	**0.6**	NE	**NL**	**NL**	<0.003	<0.003	<0.003	<0.003	0%	<0.002	0%
Naphthalene	0.01	NE	**16**	**NL**	**NL**	<0.01	<0.01	<0.01	<0.01	0%	<0.005	0%
Total Petroleum Hydrocarbons/Total Recoverable Hydrocarbons												
C6 - C9 Fraction	0.02	NE	NE	NE	NE	<0.02	<0.02	<0.02	<0.02	0%	<0.02	0%
C10 - C14 Fraction	0.05	NE	NE	NE	NE	<0.05	<0.05	<0.05	<0.05	0%	<0.05	0%
C15 - C28 Fraction	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	<0.1	0%
C29 - C36 Fraction	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	<0.05	0%
C10 - C36 Fraction (sum)	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	<0.05	0%
TRH Fraction F1	0.02	NE	NE	**1**	**NL**	<0.02	<0.02	<0.02	<0.02	0%	<0.02	0%
C6 - C10 Fraction	0.02	NE	NE	NE	NE	<0.02	<0.02	<0.02	<0.02	0%	<0.02	0%
>C10 - C16 Fraction	0.05	NE	NE	NE	NE	<0.05	<0.05	<0.05	<0.05	0%	<0.1	0%
>C16 - C34 Fraction	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	<0.1	0%
>C34 - C40 Fraction	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	<0.1	0%
TRH Fraction F2	0.05	NE	NE	**1**	**NL**	<0.05	<0.05	<0.05	<0.05	0%	<0.1	0%
Metals												
Arsenic	0.001	**0.01**	**0.024**	NE	NE	**0.002**	<0.001	<0.001	<0.001	0%	<0.001	0%
Cadmium	0.0002	**0.002**	**0.0002**	NE	NE	<0.0002	<0.0002	<0.0002	<0.0002	0%	<0.0001	0%
Chromium	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Copper	0.001	**2**	**0.0014**	NE	NE	**0.001**	**0.001**	<0.001	<0.001	0%	<0.001	0%
Lead	0.001	**0.01**	**0.0034**	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Mercury	0.0001	**0.001**	**0.00006**	NE	NE	<0.0001	<0.0001	<0.0001	<0.0001	0%	<0.0001	0%
Nickel	0.001	**0.02**	**0.011**	NE	NE	**0.006**	**0.005**	<0.001	<0.001	0%	**0.001**	67%
Zinc	0.005	NE	**0.008**	NE	NE	**0.015**	**0.009**	<0.005	<0.005	0%	<0.005	0%
Polycyclic Aromatic Hydrocarbons												
Naphthalene	0.001	NE	**16**	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Acenaphthylene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Acenaphthene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Fluorene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Phenanthrene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Anthracene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Fluoranthene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Pyrene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Benz(a)anthracene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Chrysene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Benzo(b+j)fluoranthene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Benzo(k)fluoranthene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Benzo(a)pyrene	0.001	**0.00001**	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.0005	0%
Indeno(1.2.3.cd)pyrene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Dibenz(a.h)anthracene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Benzo(g.h.i)perylene	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.001	0%
Sum of PAHs	0.001	NE	NE	NE	NE	<0.001	<0.001	<0.001	<0.001	0%	<0.0005	0%
Organochlorine Pesticides												
4.4'-DDD	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
4.4'-DDE	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
4.4'-DDT	0.0001	**0.000006**	**0.009**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.002	0%
a-BHC	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Aldrin	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Aldrin and Dieldrin (Total)	0.0001	NE	**0.0003**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
b-BHC	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Chlordanes - Total	0.001	**0.00003**	**0.002**	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.0005	0%
d-BHC	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
DDT + DDE + DDD (Total)	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Dieldrin	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endosulfan I	0.0001	**0.00003**	**0.02**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endosulfan II	0.0001	**0.00003**	**0.02**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endosulfan sulphate	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endrin	0.0001	**0.00001**	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endrin aldehyde	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Endrin ketone	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
g-BHC (Lindane)	0.0001	**0.0002**	**0.01**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Heptachlor	0.0001	**0.00001**	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Heptachlor epoxide	0.0001	NE	**0.0003**	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Hexachlorobenzene	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.0005	0%
Methoxychlor	0.0001	NE	NE	NE	NE	< 0.0001	< 0.0001	< 0.0001	< 0.0001	0%	<0.002	0%
Toxaphene	0.01	**0.0001**	NE	NE	NE	< 0.01	< 0.01	< 0.01	< 0.01	0%	-	0%

Notes:
NE - Not Established
NL - Not Limiting
All units in mg/L unless otherwise noted
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.
Shading indicates concentration exceeds criteria.

TABLE 10
SUMMARY OF GROUNDWATER ANALYTICAL DATA
170 Reservoir Road, Arndell Park, NSW

Sample ID						MW1	MW2	MW3	QW-1	RPD	QW-1A	RPD
Sample Date						17/01/18	17/01/18	17/01/18				
Organophosphorous Pesticides												
Azinphos-methyl	0.002	**0.03**	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Bolstar	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Chlorfenvinphos	0.002	**0.002**	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Chlorpyrifos	0.02	**0.01**	NE	NE	NE	< 0.02	< 0.02	< 0.02	< 0.02	0%	<0.0005	0%
Chlorpyrifos-methyl	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Coumaphos	0.02	NE	NE	NE	NE	< 0.02	< 0.02	< 0.02	< 0.02	0%	-	-
Demeton-O	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Demeton-S	0.02	NE	NE	NE	NE	< 0.02	< 0.02	< 0.02	< 0.02	0%	<0.0005	0%
Diazinon	0.002	**0.00001**	**0.004**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Dichlorvos	0.002	NE	**0.005**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Dimethoate	0.002	**0.00015**	**0.007**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Disulfoton	0.002	NE	**0.004**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
EPN	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Ethion	0.002	NE	**0.004**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Ethoprop	0.002	NE	**0.001**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Ethyl parathion	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Fenitrothion	0.002	**0.0002**	**0.007**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Fensulfothion	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Fenthion	0.002	NE	**0.007**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Malathion	0.002	**0.00005**	**0.07**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.0005	0%
Merphos	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Methyl parathion	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.002	0%
Mevinphos	0.002	NE	**0.006**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Monocrotophos	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.002	0%
Naled	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Omethoate	0.002	NE	**0.001**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Phorate	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Pirimiphos-methyl	0.02	NE	**0.09**	NE	NE	< 0.02	< 0.02	< 0.02	< 0.02	0%	<0.0005	0%
Pyrazophos	0.002	NE	**0.02**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Ronnel	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Terbufos	0.002	NE	**0.0009**	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Tetrachlorvinphos	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Tokuthion	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Trichloronate	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	-	-
Phenols (halogenated)												
2.4.5-Trichlorophenol	0.001	NE	NE	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	<0.001	0%
2.4.6-Trichlorophenol	0.01	**0.02**	**0.003**	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	<0.001	0%
2.4-Dichlorophenol	0.001	**0.2**	**0.12**	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
2.6-Dichlorophenol	0.003	NE	NE	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
2-Chlorophenol	0.003	**0.3**	**0.34**	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
4-Chloro-3-methylphenol	0.01	NE	NE	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	<0.001	0%
Pentachlorophenol	0.01	**0.01**	**0.0036**	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	<0.002	0%
Tetrachlorophenols - Total	0.03	NE	NE	NE	NE	<0.03	<0.03	<0.03	<0.03	0%	-	-
Total Halogenated Phenol	0.01	NE	NE	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	-	-
Phenols (non-halogenated)												
2.4-Dimethylphenol	0.001	NE	NE	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
2.4-Dinitrophenol	0.03	NE	**0.045**	NE	NE	<0.03	<0.03	<0.03	<0.03	0%	-	-
2-Cyclohexyl-4.6-dinitrophenol	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	-	-
2-Methyl-4.6-dinitrophenol	0.03	NE	NE	NE	NE	<0.03	<0.03	<0.03	<0.03	0%	-	-
2-Methylphenol (o-Cresol)	0.003	NE	NE	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
2-Nitrophenol	0.01	NE	NE	NE	NE	<0.01	<0.01	<0.01	<0.01	0%	<0.001	0%
3&4-Methylphenol (m&p-Cresol)	0.006	NE	NE	NE	NE	<0.006	<0.006	<0.006	<0.006	0%	<0.002	0%
4-Nitrophenol	0.03	NE	NE	NE	NE	<0.03	<0.03	<0.03	<0.03	0%	-	-
Dinoseb	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	-	-
Phenol	0.003	NE	**0.32**	NE	NE	<0.003	<0.003	<0.003	<0.003	0%	<0.001	0%
Total Non-Halogenated Phenol	0.1	NE	NE	NE	NE	<0.1	<0.1	<0.1	<0.1	0%	-	-
Polychlorinated Biphenyls												
Aroclor-1016	0.005	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1221	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1232	0.005	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1242	0.005	**0.0003**	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1248	0.005	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1254	0.005	**0.00001**	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Aroclor-1260	0.005	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Total PCB	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.001	0%
Herbicides												
2.4.5-T	0.001	**0.1**	**0.036**	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%
2.4.5-TP	0.006	NE	NE	NE	NE	< 0.006	< 0.004	< 0.004	< 0.004	0%	<0.010	0%
2.4-D	0.001	**0.03**	**0.28**	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%
2.4-DB	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%
Actril (loxynil)	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	0%
Dicamba	0.001	**0.1**	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%
Dichlorprop	0.001	**0.1**	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	-
Dinitro-o-cresol	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	0%
Dinoseb	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	-	0%
MCPA	0.001	**0.04**	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%
MCPB	0.002	NE	NE	NE	NE	< 0.002	< 0.002	< 0.002	< 0.002	0%	<0.010	0%
Mecoprop	0.001	NE	NE	NE	NE	< 0.001	< 0.001	< 0.001	< 0.001	0%	<0.010	0%

Notes:
NE - Not Established
NL - Not Limiting
All units in mg/L unless otherwise noted
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.
Shading indicates concentration exceeds criteria.

TRACE ENVIRONMENTAL

TRACE Environmental
PO Box 422
Camperdown NSW 1450
m. 0410 465 961

Monitoring Well Log

Project Name:	**Arndell Park DSI**	Hole ID.	**MW1**
Project Number:	**99.28**	Hole Depth:	**10.00 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**Yes**
Client:	**Paynter Dixon**	GW Encountered: (mBGS)	**8**
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments	Well Details	Well Construction
							Grass					
	0.10 / 0.40	MW1/0.2	0.0	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.		
		MW1/0.5	0.0				**FILL**- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.		dry	No waste. No odour. No staining.		
		MW1/1.0	0.0			CL	**CLAY**- brown / grey, red mottled, ironstone fragments.			No odour. No staining.		
	2.0	MW1/2.0	0.0									
	2.90			Natural			**Weathered SHALE**- brown / pale brown.		dry	No odour. No staining.		
	4.0										4.5 Bentonite 5.5	Grout
	6.00						**Weathered SHALE**- dark brown / grey.		humid	No odour. No staining.	6.5 Sand	
▽	8.00						**Weathered SHALE**- dark grey / dark brown.		wet	No odour. No staining.	Screen 9.5 Collapse	
	10.00						**End of Hole at 10.00m** Target depth.					
	12.0											

Notes

Backfill | Grout | Bentonite | Gravel Pack | Screen | Cave-in

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

TRACE ENV LOG 2 99.28 ARNDELL PARK V3.GPJ WSP.GDT 8/2/18 8:30:34 AM - drawn by laurie white at www.reumad.com.au

TRACE ENVIRONMENTAL

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Monitoring Well Log

Project Name:	**Arndell Park DSI**	Hole ID.	**MW2**
Project Number:	**99.28**	Hole Depth:	**8.00 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**Yes**
Client:	**Paynter Dixon**	GW Encountered: (mBGS)	**6.5**
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments	Well Details	Well Construction
							Grass					
	0.10	MW2/0.2 MW2/0.5 QS-2/QS-2A MW2/1.0	0.0 0.0 0.0	Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.		
	2.0						**FILL**- Gravelly CLAY, brown / grey with red mottles, low plasticity, sahle gravels and cobbles.			No waste. No odour. No staining.		Grout
	2.10	MW2/2.3	0.0	Natural		CL	**Gravelly CLAY**- grey with red / brown mottles, low plasticity, shale fragments.	stiff	humid	No odour. No staining.	2.5	
	2.80					CL	**CLAY**- brown with red mottles, low plasticity, some shale fragments.	soft to stiff	humid	No odour. No staining.		Bentonite
	3.40					CL	**CLAY**- pale brown, brown, medium plasticity.	soft	moist	No odour. No staining.	3.5	
	4.0											
	4.50					CL	**Silty CLAY**- pale grey with pale brown mottles, trace shale fragments.	soft	humid	No odour. No staining.	5.0	
▽	6.0								wet			Sand
	8.00						**End of Hole at 8.00m** Target depth.					Screen
	10.0											
	12.0											

Notes

Backfill | Grout | Bentonite | Gravel Pack | Screen | Cave-in

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Monitoring Well Log

Project Name:	**Arndell Park DSI**	Hole ID.	**MW3**
Project Number:	**99.28**	Hole Depth:	**11.50 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**Yes**
Client:	**Paynter Dixon**	GW Encountered: (mBGS)	**10**
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments	Well Details	Well Construction
							Grass					
	0.10	MW3/0.2	0.6	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.		
	0.40	MW3/0.5	0.4				**FILL**- Silty TOPSOIL, some Gravel.	loose	dry	No waste. No odour. No staining.		
	0.90	QS-3/QS-3A					**FILL**- CLAY / GRAVEL / SILT, brown / red / grey.			No waste. No odour. No staining.		
		MW3/1.1	0.0	Natural		CL	**Gravelly CLAY**- pale grey with pale brown mottles, low plasticity, some weathered shale fragments.	stiff	dry to humid	No odour. No staining.		
	2.0											
	2.50	MW3/2.2	0.0				**Weathered SHALE**- dark grey / brown.		dry to humid	No odour. No staining.		
	4.0										4.0	
	4.30						**Weathered SHALE**- dark grey / dark brown.		dry to humid	No odour. No staining.		
	5.0										5.0	
	6.0											
	8.0										8.5	
▽	10.0								wet			
	11.50						**End of Hole at 11.50m** Target depth.					
	12.0											

Well Construction: Grout; Bentonite; Sand; Screen

Notes

Backfill; Grout; Bentonite; Gravel Pack; Screen; Cave-in

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH1**
Project Number:	**99.28**	Hole Depth:	**1.80 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.30	BH1/0.2	1.1				**FILL**- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.	loose	dry	No waste. No odour. No staining.
	0.5	BH1/0.5	0.0	Natural		CL	**CLAY**- grey with red / pale brown mottles, grass roots, trace ironstone.	dense	dry	No odour. No staining.
	1.40						**Weathered SHALE**- grey / brown.		dry	No odour. No staining.
	1.60	BH1/1.6	0.0				**Weathered SHALE**- brown.		dry	No odour. No staining.
	1.80						**End of Hole at 1.80m** Push Tube refusal.			

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH2**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
		BH2/0.2	2.8	Fill			**FILL**- CLAY / SAND, brown, medium grained sand, gravel / shale fragments.			No waste. No odour. No staining.
	0.5	BH2/0.5	1.5							
	1.0	BH2/1.0	2.5							
	1.5									
	1.60						**FILL**- Gravelly CLAY, red / brown, ironstone fragments.	stiff	humid	No odour. No staining. Trace ash?
	2.0	BH2/2.0	1.5							
	2.40									
	2.5			Natural		CL	**Silty CLAY**- grey / brown with red mottles.	stiff	humid	No odour. No staining.
	2.70						**End of Hole at 2.70m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH3**
Project Number:	**99.28**	Hole Depth:	**3.40 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.		dry	No waste. No odour. No staining.
		BH3/0.2	---				**FILL**- Gravelly CLAY, sand, shale fragments.			No odour. No staining. Bricks.
	0.5	BH3/0.5	0.0							
	1.0	BH3/1.0	1.4							
	1.5									
	1.60						**FILL**- CLAY, pale brown / grey / dark brown, medium plasticity.	soft	moist	No odour. No staining. Trace ash.
	2.0	BH3/2.0	0.0							
	2.50			Natural		CL	**CLAY**- pale grey with orange mottles, low plasticity.	stiff	humid	No odour. No staining.
	3.0	BH3/3.0	3.0							
	3.10						**Weathered SHALE**- brown.		dry	No odour. No staining.
	3.40						**End of Hole at 3.40m** Target depth.			
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH4**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.90 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH4/0.2	1.7				**FILL**- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.	loose	dry	No waste. No odour. No staining.
	0.40									
	0.5	BH4/0.5 QS-1/QS-1A	1.4				**FILL**- CLAY / GRAVEL / SAND / SILT, shale fragments.	loose	dry	No odour. No staining. Bricks.
	1.0	BH4/1.0	3.0							
	1.5									
	1.70									
	2.0	BH4/2.0	2.8				**FILL**- Gravelly CLAY, brown / grey, ironstone / shale fragments.		humid	No waste. No odour. No staining.
	2.5									
	2.60			Natural		CL	**Silty CLAY**- brown / grey.		humid	No odour. No staining.
	3.0	BH4/3.0	2.2							
	3.10					CL	**Silty CLAY**- brown / grey with red mottles.		humid	No odour. No staining.
	3.5									
	3.90									
	4.0						**End of Hole at 3.90m** Target depth.			

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH5**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	BH5/0.2	2.4	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
							FILL- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.			No waste. No odour. No staining.
	0.5	BH5/0.5	3.8							
	0.80						**FILL**- CLAY / GRAVEL / SAND / SILT.	loose	dry	No odour. No staining.
	1.0	BH5/1.0	3.3							
	1.5									
	1.80									
	2.0	BH5/2.0	0.0	Natural		CL	**Silty CLAY**- pale brown with red mottles, medium plasticity.	soft	humid	No odour. No staining.
	2.5									
	2.60									
	2.70						**Weathered SHALE**- brown.		dry	No odour. No staining.
							End of Hole at 2.70m Target depth.			
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH6**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**8/01/2018**	Northing:	
Date Completed:	**8/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	BH6/0.2	0.8	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
							FILL- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.			No waste. No odour. No staining.
	0.40									
	0.5	BH6/0.5	1.5	Natural		CL	**CLAY**- brown with red mottles, low plasticity.		dry	No odour. No staining.
	1.0	BH6/1.0	1.5							
	1.5									
	1.60						**Weathered SHALE**- grey / brown.		dry	No odour. No staining.
	2.0									
	2.5									
	2.70						**End of Hole at 2.70m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **8/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

TRACE ENVIRONMENTAL

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Borehole Log

Hole ID. **BH7**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.40	BH7/0.2	0.0	Natural		ML	**Clayey SILT**- brown.	loose	dry	No odour. No staining.
	0.5	BH7/0.5	0.0			CL	**CLAY**- brown with red mottles, low plasticity.	stiff	dry	No odour. No staining.
	1.0	BH7/1.0	0.0							
	1.20									
	1.5					CL	**Gravelly CLAY**- brown / pale brown with red mottles, low plasticity, ironstone fragments.	stiff	dry	No odour. No staining.
	1.70									
	2.0					CL	**CLAY**- pale grey with brown / orange mottles, low plasticity.	soft	humid	No odour. No staining.
	2.5									
	2.70									
	3.0						**End of Hole at 2.70m** Target depth.			
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

TRACE ENVIRONMENTAL

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Borehole Log

Hole ID. **BH8**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH8/0.2	0.0				**FILL**- Gravelly CLAY, brown / grey with red mottles, low plasticity, shale gravel and cobbles.		dry	No waste. No odour. No staining.
	0.40									
	0.5	BH8/0.6	0.5	Fill			**FILL**- Gravelly Silty CLAY, brown / red.		dry	No waste. No odour. No staining.
	1.0									
	1.10									
		BH8/1.2	0.6			CL	**Gravelly CLAY**- brown with red mottles, trace ironstone.		humid	No odour. No staining.
	1.5									
	1.70									
	2.0			Natural		CL	**Gravelly CLAY**- pale grey with pale brown / red mottles, trace ironstone.		humid	No odour. No staining.
	2.5									
	2.70									
	3.0						**End of Hole at 2.70m** Target depth.			
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH9**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.50 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
		BH9/0.2	0.6				**FILL**- Clayey SILT, brown, low plasticity.			No waste. No odour. No staining.
	0.30						**FILL**- Gravelly CLAY, brown / grey with red mottles, low plasticity, shale gravel and cobbles.		dry	No odour. No staining. Some concrete.
	0.5	BH9/0.8	0.7							
	1.0									
	1.50						**FILL**- Gravelly CLAY, grey / brown / red / orange, shale fragments.	soft	humid	No waste. No odour. No staining.
	2.0									
	2.5	BH9/2.6	0.0							Asbestos fragment at 2.6m.
	2.70			Natural		ML	**Clayey SILT**- dark grey / brown mottled.	soft	moist	No odour. No staining.
	3.0									
	3.10	BH9/3.2	0.4			CL	**Silty CLAY**- brown / red mottled, trace ironstone, weathered shale fragments.	soft	moist	No odour. No staining.
	3.50						**End of Hole at 3.50m** Target depth.			
	4.0									

Notes

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**
Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH10**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.80 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	BH10/0.2	0.0	Fill			**FILL**- TOPSOIL.		dry	No waste. No odour. No staining.
							FILL- Gravelly CLAY, brown / grey with red mottles, low plasticity, shale gravel and cobbles.			No waste. No odour. No staining.
	0.5	BH10/0.8	0.4							
	1.0									
	1.5									
	2.0	BH10/2.0	0.5							
	2.40									
	2.5			Natural		ML	**Gravelly Clayey SILT**- dark grey / dark brown, orange mottles.	soft to stiff	moist	No odour. No staining.
	3.0	BH10/3.0	0.8							
	3.50					CL	**CLAY**- pale grey with pale brown mottles.	stiff	moist	No odour. No staining.
	3.80						**End of Hole at 3.80m** Target depth.			
	4.0									

Notes

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**
Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH11**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.80 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.		dry	No waste. No odour. No staining.
		BH11/0.2	0.0				**FILL**- Gravelly CLAY, brown / grey with red mottles, low plasticity, shale gravel and cobbles.			No waste. No odour. No staining.
	0.5	BH11/0.5	0.5							
	1.0									
	1.5	BH11/1.5	0.5							
	2.0									
	2.40									
	2.5			Natural		CL	**Silty CLAY**- brown / dark grey, low plasticity, trace ironstone.	stiff	moist	No odour. No staining.
	2.70	BH11/2.7	0.0							
	3.0					CL	**Silty CLAY**- pale grey with pale brown mottles, low to medium plasticity.	stiff	moist	No odour. No staining.
	3.5									
	3.80						**End of Hole at 3.80m** Push Tube refusal.			
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH12**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.20 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
	0.20	BH12/0.2	0.0				**FILL**- Gravelly Sandy SILT, brown, pale brown, orange, shale fragments.		dry	No waste. No odour. No staining.
	0.5	BH12/0.5	0.0				**FILL**- Gravelly CLAY, brown / grey with red mottles, low plasticity, shale gravel and cobbles.			No waste. No odour. No staining.
	1.0	BH12/1.0	0.7							
	1.5									
	1.60			Natural		CL	**Gravelly CLAY**- brown with red mottles, trace ironstone.	stiff	humid	No odour. No staining.
	2.00									
	2.20	BH12/2.1	0.3			CL	**Gravelly CLAY**- pale grey with pale brown / red mottles, trace ironstone.	stiff	humid	No odour. No staining.
	2.5						**End of Hole at 2.20m** Push Tube refusal.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date:	**9/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date:	**2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH13**
Project Number:	**99.28**	Hole Depth:	**2.20 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	BH13/0.2	0.0	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
	0.30						**FILL**- Gravelly SILT, some Clay, brown / grey.			No waste. No odour. No staining.
	0.5	BH13/0.5	0.0				**FILL**- Gravelly Silty CLAY, brown / red.	soft to stiff	dry	No waste. No odour. No staining.
	1.0	BH13/1.0	0.8							
	1.20			Natural		CL	**Gravelly CLAY**- brown with red mottles, trace ironstone.	stiff	humid	No odour. No staining.
	1.5									
	1.60					CL	**Gravelly CLAY**- pale grey with pale brown / red mottles, trace ironstone.	stiff	humid	No odour. No staining.
	2.0	BH13/2.0	0.5							
	2.20						**End of Hole at 2.20m** Push Tube refusal.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **9/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Borehole Log

Hole ID. **BH14**

Project Name:	**Arndell Park DSI**	Hole Depth:	**1.40 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
		BH14/0.2	0.0	Fill			**FILL**- SILT, CLAY, TOPSOIL, brown, shale fragments.			No waste. No odour. No staining.
	0.30									
	0.40						**FILL**- CLAY, brown / grey, trace ironstone.	stiff	moist	No waste. No odour. No staining.
	0.5	BH14/0.5	0.3	Natural		CL	**Silty CLAY**- grey / brown, low plasticity, grass roots.	soft	dry	No odour. No staining.
	0.80									
	1.0	BH14/1.0	0.5			CL	**CLAY**- brown with red mottles, low plasticity.	stiff	humid	No odour. No staining.
	1.20									
	1.40					CL	**Gravelly CLAY**- pale grey with pale brown mottles, weathered shale fragments.	stiff	dry to humid	No odour. No staining.
	1.5						**End of Hole at 1.40m** Push Tube refusal.			
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH15**
Project Number:	**99.28**	Hole Depth:	**2.10 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH15/0.2	0.0				**FILL**- Clayey SILT, brown, low plasticity.	loose	moist	No waste. No odour. No staining.
	0.30						**FILL**- Gravelly Silty CLAY, brown, low plasticity.	soft	humid	No waste. No odour. No staining.
	0.5			Fill						
		BH15/0.8	0.0							
	1.0									
	1.30									
	1.50					CL	**CLAY**- dark brown with pale brown mottles, low plasticity.	stiff	humid to moist	No odour. No staining.
		BH15/1.5	0.0	Natural		CL	**CLAY**- pale grey with pale brown mottles, medium plasticity.	soft to stiff	moist	No odour. No staining.
	2.0						Tree roots at 2.1m.			
	2.10						**End of Hole at 2.10m** Target depth.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH16**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH16/0.2	0.0				**FILL**- Clayey SILT, brown / dark brown.	loose	humid to moist	No waste. No odour. No staining.
	0.50	BH16/0.5	0.0	Fill			**FILL**- Gravelly Silty CLAY, brown / pale brown, low plasticity.	soft	dry to humid	No waste. No odour. No staining.
	1.0									
	1.5	BH16/1.5	0.0							
	1.90									
	2.0	BH16/2.2	0.0	Natural		CL	**CLAY**- brown / pale brown with red mottles, low plasticity.	stiff	humid to moist	No odour. No staining.
	2.5									
	2.60						**End of Hole at 2.60m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **9/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Borehole Log

Hole ID. **BH17**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**9/01/2018**	Northing:	
Date Completed:	**9/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.30	BH17/0.2	0.0				**FILL**- Silty TOPSOIL, GRAVEL, CLAY.			No waste. No odour. No staining.
	0.5	BH17/0.5	0.0	Fill			**FILL**- Gravelly Silty CLAY, brown / pale brown, low plasticity.	soft	dry to humid	No waste. No odour. No staining.
	1.0	BH17/1.0	0.0							
	1.5									
	1.80									
	2.0	BH17/2.1	0.0	Natural		CL	**CLAY**- pale grey with pale brown mottles, medium plasticity.	soft to stiff	humid	No odour. No staining.
	2.5									
	2.60						**End of Hole at 2.60m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **9/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH18**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	moist	No waste. No odour. No staining.
	0.30	BH18/0.2	0.0	Fill			**FILL**- Clayey SILT, brown, low plasticity.			No waste. No odour. No staining.
	0.5	BH18/0.5	0.0				**FILL**- CLAY, GRAVEL, SILT, brown.		moist	No waste. No odour. No staining. Concrete.
	0.70									
	1.0	BH18/1.0	0.0	Natural		CL	**Silty CLAY**- grey with pale brown mottles, low plasticity.	soft	dry to humid	No odour. No staining.
	1.70									
	2.0					CL	**Silty CLAY**- brown with red mottles, low plasticity.	stiff	moist	No odour. No staining.
	2.50									
	2.70					CL	**Gravelly Silty CLAY**- pale grey with orange mottles, medium plasticity, ironstone fragments.	soft	moist	No odour. No staining.
	3.0						**End of Hole at 2.70m** Target depth.			
	3.5									
	4.0									

Notes

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**
Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH19**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.00 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.	loose	dry to humid	No waste. No odour. No staining.
	0.30	BH19/0.2	0.0				**FILL**- CLAY, red / brown, low plasticity.	stiff	dry to humid	No waste. No odour. No staining.
	0.5	BH19/0.5	0.3				**FILL**- Gravelly Silty CLAY, brown / pale grey / light brown.	stiff	dry to humid	No waste. No odour. No staining.
	0.90									
	1.0	BH19/1.1	0.0	Natural		CL	**Silty CLAY**- grey with pale brown mottles, low plasticity.	stiff	dry to humid	No odour. No staining.
	1.30									
	1.5					CL	**Silty CLAY**- brown with red mottles, low plasticity.	stiff	humid	No odour. No staining.
	1.70									
	2.00					CL	**Silty CLAY**- pale grey / pale brown, low plasticity.	stiff	humid	No odour. No staining.
	2.5						**End of Hole at 2.00m** Push Tube refusal.			
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH20**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.20 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH20/0.3	0.0	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.	loose	humid	No waste. No odour. No staining.
	0.5									
		BH20/0.8	0.0							
	1.0									
	1.30									
	1.5	BH20/1.5	0.0	Natural		CL	**CLAY**- pale grey / pale brown with red mottles, medium plasticity.	soft to stiff	moist	No odour. No staining.
	1.70									
	2.0					CL	**Silty CLAY**- grey with pale brown & red mottles, medium plasticity.	soft	moist	No odour. No staining.
	2.20									
	2.5						**End of Hole at 2.20m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH21**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH21/0.2	0.0				**FILL**- Silty TOPSOIL, CLAY, brown.	loose	moist	No waste. No odour. No staining.
	0.50	BH21/0.5	0.0				**FILL**- CLAY, GRAVEL, SILT, brown.	loose	humid	No waste. No odour. No staining.
	1.0	BH21/1.0	---	Fill						
	1.5									
	2.0									
	2.50									
	2.70	BH21/2.6	0.0	Nat.		CL	**Silty CLAY**- pale grey / brown, medium plasticity.	soft	moist	No odour. No staining.
							End of Hole at 2.70m Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **10/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH22**
Project Number:	**99.28**	Hole Depth:	**2.70 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	dry to humid	No waste. No odour. No staining.
		BH22/0.4	0.0	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.			No waste. No odour. No staining.
	0.5									
	1.0	BH22/1.2	0.0							
	1.5									
	2.00									
				Natural		CL	**Silty CLAY**- grey with pale brown mottles, low plasticity.	stiff	humid	No odour. No staining.
	2.30	BH22/2.3	0.0							
	2.5					CL	**Silty CLAY**- brown with red mottles, low plasticity.	stiff	humid to moist	No odour. No staining.
	2.70									
							End of Hole at 2.70m Target depth.			
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Project Name:	**Arndell Park DSI**	Hole ID.	**BH23**
Project Number:	**99.28**	Hole Depth:	**2.80 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	moist	No waste. No odour. No staining.
		BH23/0.3	0.0	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.	loose	humid	No waste. No odour. No staining.
	0.5									
	1.0	BH23/1.2	0.0							
	1.5									
	2.0									
	2.40	BH23/2.3	0.0							Asbestos fragment at 2.3m.
	2.5			Natural		CL	**Silty CLAY**- brown with red mottles, low plasticity.	soft to stiff	moist	No odour. No staining.
	2.80	BH23/2.7	0.0							
	3.0						**End of Hole at 2.80m** Target depth.			
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH24**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.75 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	moist	No waste. No odour. No staining.
		BH24/0.2	0.0				**FILL**- Silty TOPSOIL, some Clay.	loose	moist	No waste. No odour. No staining.
	0.30									
	0.5	BH24/0.5	0.0				**FILL**- CLAY, GRAVEL, SILT, brown.	loose	humid	No waste. No odour. No staining.
	1.0	BH24/1.2	0.0	Fill						
	1.5									
	2.0									
	2.40									
	2.5	BH24/2.6	0.0	Natural		CL	**Silty CLAY**- brown with red mottles, low plasticity.	soft to stiff	moist	No odour. No staining.
	2.75									
	3.0						**End of Hole at 2.75m** Target depth.			
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **10/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Borehole Log

Hole ID. **BH25**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.40 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	dry to humid	No waste. No odour. No staining.
		BH25/0.2	0.0	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.			No waste. No odour. No staining.
	0.5	BH25/0.5	0.0							
	1.0	BH25/1.0	0.0							
	1.5									
	1.80									
	2.0	BH25/2.0	0.0	Natural		CL	**Silty CLAY**- brown with red mottles, low plasticity.	stiff	moist	No odour. No staining.
	2.20					CL	**Sandy Silty CLAY**- brown / orange / grey, dark brown mottles, low to medium plasticity, fine grained sand.	soft	moist	No odour. No staining.
	2.40						**End of Hole at 2.40m** Push Tube refusal.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **10/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Borehole Log

Hole ID. **BH26**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 1m, Solid Flight Auger to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
		BH26/0.3	0.0				**FILL**- CLAY, GRAVEL, SILT, brown.	loose	dry to humid	No waste. No odour. No staining.
	0.5									
		BH26/0.8	0.0							
	1.0									
		BH26/1.2	0.0							
	1.5									
	2.0									
	2.40									
	2.5	BH26/2.5	0.0	Nat.		CL	**Sandy Silty CLAY**- brown / orange / grey, dark brown mottles, low to medium plasticity, fine grained sand.	soft	moist	No odour. No staining.
	2.60						**End of Hole at 2.60m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **10/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **8/02/2018**

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Borehole Log

Hole ID. **BH27**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.90 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Drill Company:	**Numac Drilling**		
Drill Method:	**Hand Auger to 0.3m, Push Tube to EOH**	Easting:	
Date Started:	**10/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
	0.5	BH27/0.4	0.0				**FILL**- CLAY, GRAVEL, SILT, brown.	loose	dry to humid	No waste. No odour. No staining.
	1.0	BH27/0.8	0.0							
	1.5	BH27/1.5	0.0							
	2.0									
	2.5									
	3.0									
	3.10			Natural		CL	**Gravelly Silty CLAY**- brown with red mottles, low plasticity, ironstone fragments.	stiff	humid	No odour. No staining.
	3.5	BH27/3.2	0.0							
	3.90						**End of Hole at 3.90m** Push Tube refusal.			
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **10/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

TRACE ENVIRONMENTAL

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Test Pit Log

Pit ID. **TP1**

Project Name:	**Arndell Park DSI**	Hole Depth:	**1.30 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
	0.20	TP1/0.2	0.0				**FILL**- Clayey SILT, trace gravel.			No waste. No odour. No staining.
	0.40						**FILL**- CLAY / GRAVEL / SILT, brown / orange / grey.	stiff	humid	No waste. No odour. No staining.
	0.5	TP1/0.5 QS-4/QS-4A	0.0				**FILL**- CLAY, grey / brown, weathered shale gravel.		humid	No waste. No odour. No staining.
	0.70			Natural		CL	**CLAY**- brown / grey with red / orange mottles, low plasticity.	stiff	humid	No odour. No staining.
	1.0	TP1/1.0	0.0							
	1.30						**End of Hole at 1.30m** Target depth.			
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP2**

Project Name:	**Arndell Park DSI**	Hole Depth:	**1.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
	0.20	TP2/0.2	0.0				**FILL**- Clayey SILT, trace gravel.			No waste. No odour. No staining.
	0.40	TP2/0.4	0.0				**FILL**- CLAY / GRAVEL / SILT, brown / orange / grey.	stiff	humid	No waste. No odour. No staining.
	0.5						**FILL**- CLAY, grey brown, weathered shale gravel.	stiff	humid	No odour. No staining. Asbestos at 0.4m.
	1.0	TP2/1.0	0.0							
	1.10			Natural		CL	**Gravelly Silty CLAY**- brown / pale brown / orange / dark grey, low plasticity.	stiff	humid	No odour. No staining.
	1.40									
	1.5	TP2/1.5	0.0			CL	**CLAY**- brown with orange mottles, low plasticity.	stiff	moist	No odour. No staining.
	1.60						**End of Hole at 1.60m** Target depth.			
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP3**

Project Name:	**Arndell Park DSI**	Hole Depth:	**1.10 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.20	TP3/0.2	0.0				**FILL**- Clayey SILT, trace gravel.	medium dense	dry	No waste. No odour. No staining.
	0.5	TP3/0.5 QS-5/QS-5A	0.0				**FILL**- CLAY, grey brown, weathered shale gravel.	stiff	humid	No waste. No odour. No staining.
	0.60									
	0.80			Natural		CL	**Gravelly Silty CLAY**- brown / pale brown / orange / dark grey, low plasticity.	stiff	humid	No odour. No staining.
	1.0	TP3/1.0	1.1			CL	**CLAY**- brown / grey with red / orange mottles, low plasticity.	stiff	humid	No odour. No staining.
	1.10						**End of Hole at 1.10m** Target depth.			
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP4**

Project Name:	**Arndell Park DSI**	Hole Depth:	**0.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
	0.20						**FILL**- Clayey SILT, trace gravel.			No waste. No odour. No staining.
	0.40	TP4/0.3	0.0				**FILL**- CLAY / GRAVEL / SILT, brown / orange / grey.	stiff	humid	No odour. No staining. Asbestos at 0.3m.
	0.5			Natural		CL	**CLAY**- brown / grey with red / orange mottles, low plasticity.	soft to stiff	humid	No waste. No odour. No staining.
	0.60	TP4/0.6	0.8				**End of Hole at 0.60m** Target depth.			
	1.0									
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP5**

Project Name:	**Arndell Park DSI**	Hole Depth:	**0.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		TP5/0.2	0.0	Fill			**FILL**- Sandy SILT (TOPSOIL), brown, fine grained sand.	loose	moist	No waste. No odour. No staining.
	0.30						**FILL**- Gravelly Silty CLAY, ironstone fragments.	soft	moist	No waste. No odour. No staining.
	0.50									
	0.60	TP5/0.6	0.0	Nat		CL	**CLAY**- brown / grey with red / orange mottles, low plasticity.	stiff	moist	No odour. No staining.
							End of Hole at 0.60m Target depth.			

1.0
1.5
2.0
2.5
3.0
3.5
4.0

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP6**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.70 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**.	loose	humid	No waste. No odour. No staining.
	0.30	TP6/0.2	0.0				**FILL**- Clayey SILT, trace gravel.			No waste. No odour. No staining.
	0.5	TP6/0.5	0.0				**FILL**- CLAY, grey brown, weathered shale gravel.	soft	humid	No waste. No odour. No staining.
	0.70						**FILL**- CLAY, grey, with orange / pale brown mottles, ironstone fragments.	stiff	humid	No waste. No odour. No staining.
	1.00	TP6/1.0	0.0	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.	loose	moist	No odour. No staining. Asphalt, terracotta, bricks, concrete. Asbestos at 1m.
	1.5									
	2.0									Asbestos at 2.2m.
	2.50									
	2.70	TP6/2.6	0.0	Nat.		CL	**Gravelly Silty CLAY**- grey / pale brown / orange, dark brown mottled, medium plasticity.	soft	moist	No odour. No staining.
	3.0						**End of Hole at 2.70m** Target depth.			
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP7**
Project Number:	**99.28**	Hole Depth:	**3.00 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
		TP7/0.2	0.0				**FILL**- Clayey SILT, trace gravel.			No waste. No odour. No staining.
	0.30									
	0.5	TP7/0.5	0.0				**FILL**- CLAY, grey brown, weathered shale gravel.	soft to stiff	moist	No odour. No staining. Brick and terracotta fragments.
	1.0			Fill						
	1.5	TP7/1.5	0.0							Asbestos fragment observed at 1.3m.
	2.0									
	2.5									
	2.60									
		TP7/2.8	0.0	Natural		ML	**Clayey SILT**- dark brown / brown mottled.	soft	moist	No odour. No staining.
	3.00									
							End of Hole at 3.00m Target depth.			
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP8**

Project Name:	**Arndell Park DSI**	Hole Depth:	**3.50 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**11/01/2018**	Northing:	
Date Completed:	**10/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	TP8/0.2	0.0	Fill			**FILL**- TOPSOIL.	soft	humid	No waste. No odour. No staining.
							FILL- CLAY, grey brown, weathered shale gravel.			No waste. No odour. No staining.
	0.5	TP8/0.5 QS-6/QS-6A	0.0							
	0.80						**FILL**- CLAY, pale grey with red mottles, ironstone fragments, sandstone cobbles / boulders.	stiff	moist	No odour. No staining. Brick, concrete and terracotta fragments.
	1.0									
	1.5	TP8/1.5	0.4							
	2.0									
	2.5									
	3.0	TP8/3.0	0.0							
	3.20			Natural		CL	**Gravelly Silty CLAY**- grey / dark grey / brown / orange, medium to high plasticity.	soft	moist to wet	No odour. No staining.
	3.50						**End of Hole at 3.50m** Target depth.			
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **11/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP9**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.00 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
		TP9/0.2	1.9				**FILL**- CLAY, grey brown, weathered shale gravel.			No waste. No odour. No staining.
	0.5	TP9/0.5	2.1							
	0.90						**FILL**- CLAY, GRAVEL, grey / brown / red, weathered shale gravel.	stiff	humid	No waste. No odour. No staining.
	1.0	TP9/1.2	1.5							
	1.5									
	1.80			Nat.		CL	**Silty CLAY**- brown with orange mottles, medium to low plasticity.	soft	moist	No odour. No staining.
	2.00	TP9/2.0	0.9				**End of Hole at 2.00m** Target depth.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP10**

Project Name:	**Arndell Park DSI**	Hole Depth:	**0.60 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.30	TP10/0.2	1.5				**FILL**- Clayey SILT, trace gravel.	loose	moist	No waste. No odour. No staining.
	0.5			Natural		CL	**CLAY**- brown / grey, some red mottles, low plasticity.	stiff	humid	No odour. No staining.
	0.60	TP10/0.6	2.0				**End of Hole at 0.60m** Target depth.			
	1.0									
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP11**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.40 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
		TP11/0.3	2.9	Fill			**FILL**- CLAY, grey / brown, weathered shale gravel.		humid	No waste. No odour. No staining.
	0.5									
	0.60						**FILL**- Gravelly Silty CLAY, grey / brown, red mottles, low plasticity.	stiff	humid	No waste. No odour. No staining.
	1.0	TP11/1.0	3.0							
	1.5									
	1.70									
	2.0	TP11/2.0	2.7	Natural		CL	**Silty CLAY**- grey with orange / pale brown mottles, low plasticity.	soft to stiff	humid	No odour. No staining.
	2.40									
	2.5						**End of Hole at 2.40m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **12/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP12**
Project Number:	**99.28**	Hole Depth:	**2.50 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.	loose	moist	No waste. No odour. No staining.
		TP12/0.2	1.1				**FILL**- CLAY, grey / brown, weathered shale gravel.		humid	No waste. No odour. No staining.
	0.5									
	1.0									
		TP12/1.2	1.0							
	1.5									
	1.60						**FILL**- Gravelly CLAY, brown / grey, shale fragments.	stiff	humid	No waste. No odour. No staining.
	2.0									
	2.10			Natural		CL	**Silty CLAY**- grey / brown, medium to low plasticity.	soft	moist	No odour. No staining.
		TP12/2.3	0.6							
	2.50						**End of Hole at 2.50m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date:	**12/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date:	**2/02/2018**

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Test Pit Log

Pit ID.	**TP13**		
Project Name:	**Arndell Park DSI**	Hole Depth:	**2.10 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05			Fill			**FILL**- TOPSOIL.	loose	moist	No waste. No odour. No staining.
	0.30	TP13/0.2	---				**FILL**- Clayey SILT, dark brown, low plasticity.	loose	moist	No waste. No odour. No staining.
	0.5	TP13/0.5	---				**FILL**- CLAY, grey / red mottled, low plasticity, ironstone fragments, shale gravel.	stiff	humid	No waste. No odour. No staining.
	1.0	TP13/1.0	---							
	1.40									
	1.5						**FILL**- CLAY, brown / dark brown mottled, shale gravel.	stiff	humid	No waste. No odour. No staining.
	1.90									
	2.0	TP13/2.0	---	Natural			**SILTSTONE / SILT**- pale grey / pale brown.	loose	humid to dry	No odour. No staining.
	2.10						**End of Hole at 2.10m** Target depth.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **12/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP14**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.00 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		TP14/0.4	0.0	Fill			**FILL**- CLAY, grey, red mottles, low plasticity.	stiff	humid	No odour. No staining. Terracotta.
	0.5									
		TP14/1.0	0.0							
	1.0									
	1.20									
	1.5			Natural		CL	**Silty CLAY**- brown with red mottles, medium plasticity.	soft	moist	No odour. No staining.
	1.70									
		TP14/1.8	0.0			CL	**Silty Gravelly CLAY**- brown with red mottles, medium plasticity, ironstone gravels.	soft to stiff	moist	No odour. No staining.
	2.00						**End of Hole at 2.00m** Target depth.			
	2.5									
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP15**
Project Number:	**99.28**	Hole Depth:	**2.70 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10						**FILL**- TOPSOIL.			No waste. No odour. No staining.
		TP15/0.3	1.1	Fill			**FILL**- CLAY, GRAVEL, SILT, brown.	loose	dry to humid	No odour. No staining. Sandstone boulders, bricks, concrete.
	0.5									
	1.0	TP15/1.2	1.4							
	1.5									
	2.0									
	2.40									
	2.5	TP15/2.5	0.8	Natural		CL	**Silty CLAY**- brown with red mottles, low plasticity.	soft	humid	No waste. No odour. No staining.
	2.70						**End of Hole at 2.70m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

Log Drawn By:	**Laurie White**	Logged By:	**Matt Vanderheyden**	Date: **12/01/2018**
Contact:	**laurie.white@reumad.com.au**	Checked By:	**Matt Vanderheyden**	Date: **2/02/2018**

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Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP16**
Project Number:	**99.28**	Hole Depth:	**2.70 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
		TP16/0.4	1.9				**FILL**- CLAY, GRAVEL, SILT, brown.	loose	humid	No waste. No odour. No staining.
	1.20	TP16/1.3	2.1				**FILL**- CLAY, grey, red / brown mottles, ironstone fragments, weathered shale fragments.	stiff	humid	No waste. No odour. No staining.
	1.60	TP16/2.0	1.7				**FILL**- CLAY, grey / brown, weathered shale gravel.		humid	No waste. No odour. No staining.
	2.40			Natural		CL	**Silty CLAY**- brown with red mottles, low plasticity.	soft to stiff	moist	No odour. No staining.
	2.70						**End of Hole at 2.70m** Target depth.			

Notes

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**
Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **8/02/2018**

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Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP17**
Project Number:	**99.28**	Hole Depth:	**2.80 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.	loose	humid	No waste. No odour. No staining.
		TP17/0.2	2.3				**FILL**- Gravelly Silty CLAY, sandstone boulders.	soft to stiff	humid	No waste. No odour. No staining.
	0.40									
	0.5	TP17/0.5	1.2				**FILL**- CLAY, GRAVEL, SILT, brown, weathered shale boulders.	loose to dense	humid	No odour. No staining. Concrete.
	1.0	TP17/1.0	0.9							
	1.5									
	2.0									
	2.40									
	2.5	TP17/2.5	0.7	Natural		CH	**CLAY**- grey / dark grey with red mottles, high plasticity.	soft	moist	No odour. No staining.
	2.80									
	3.0						**End of Hole at 2.80m** Target depth.			
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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Test Pit Log

Pit ID. **TP18**

Project Name:	**Arndell Park DSI**	Hole Depth:	**2.00 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.10			Fill			**FILL**- TOPSOIL.			No waste. No odour. No staining.
	0.20	TP18/0.2	0.0				**FILL**- Silty TOPSOIL, brown.	loose	dry	No waste. No odour. No staining.
	0.50						**FILL**- CLAY, grey with red mottles, shale gravel.	soft to stiff	dry	No waste. No odour. No staining.
	1.0	TP18/0.7 QS-7/QS-7A	0.0				**FILL**- SILT, brown, gravel, sandstone boulders, clay brown with red mottles.	loose	dry	No waste. No odour. No staining.
	1.5	TP18/1.2	0.0							
	1.80									
	2.00	TP18/1.9	0.0	Nat.		CL	**Silty CLAY**- brown with red mottles, low to medium plasticity.	medium dense	humid	No odour. No staining.
	2.5						**End of Hole at 2.00m** Target depth.			
	3.0									
	3.5									
	4.0									

Notes

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Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

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PO Box 422
Camperdown NSW 1450
m. 0410 465 961

Test Pit Log

Pit ID. **TP19**

Project Name:	**Arndell Park DSI**	Hole Depth:	**0.90 m**
Project Number:	**99.28**	GW Encountered:	**No**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**		
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05	TP19/0.3 QS-8/QS-8A	0.0	Fill			**FILL**- TOPSOIL.	loose	dry	No waste. No odour. No staining.
							FILL- SILT, pale brown / pale grey, low plasticity.	loose	dry	No waste. No odour. No staining.
	0.50	TP19/0.6	0.0	Natural		CL	**CLAY**- grey / brown, red mottles.	stiff	dry	No odour. No staining.
	0.90						**End of Hole at 0.90m** Target depth.			
	1.0									
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**

TRACE ENVIRONMENTAL

TRACE Environmental
PO Box 422
Camperdown NSW 1450
m. 0410 465 961

Test Pit Log

Project Name:	**Arndell Park DSI**	Pit ID.	**TP20**
Project Number:	**99.28**	Hole Depth:	**0.90 m**
Location / Site:	**170 Reservoir Road, Arndell Park NSW**	GW Encountered:	**No**
Client:	**Paynter Dixon**		
Excavation Company:	**A Civil**		
Excavation Method:	**Excavator to EOH**	Easting:	
Date Started:	**12/01/2018**	Northing:	
Date Completed:	**12/01/2018**	Zone:	

Water Inflow	Depth (m)	Sample ID No.	Sample PID ppm	Material Type	Graphic Log	USCS Symbol	Material Description	Consistency / Density	Moisture	Observations / Comments
							Grass			
	0.05						**FILL**- TOPSOIL.	stiff	dry	No waste. No odour. No staining.
		TP20/0.3	0.0	Fill			**FILL**- CLAY, Silt, Gravel, brown / grey / red.			No waste. No odour. No staining.
	0.5									
	0.70			Nat.		CL	**Silty CLAY**- brown with red mottles, low plasticity.	stiff	dry	No odour. No staining.
	0.90	TP20/0.9	0.0				**End of Hole at 0.90m** Target depth.			
	1.0									
	1.5									
	2.0									
	2.5									
	3.0									
	3.5									
	4.0									

Notes

REUMAD

Log Drawn By: **Laurie White**
Contact: **laurie.white@reumad.com.au**

Logged By: **Matt Vanderheyden** Date: **12/01/2018**
Checked By: **Matt Vanderheyden** Date: **2/02/2018**