



# **Douglas Partners**

*Geotechnics | Environment | Groundwater*

Report on  
Detailed Site Investigation (Contamination)

Surface & Civil Alignment Works (SCAW) Package for  
Sydney Metro - Western Sydney Airport (SMWSA)  
Area of Environmental Concern (AEC) 31a,  
Sweetwater Grove, Orchard Hills

Prepared for  
CPB Contractors Pty Limited  
& United Infrastructure Pty Limited  
Joint Venture (CPBUI JV)

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Integrated Practical Solutions



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Douglas Partners Pty Ltd  
ABN 75 053 980 117  
www.douglaspartners.com.au  
96 Hermitage Road  
West Ryde NSW 2114  
PO Box 472  
West Ryde NSW 1685  
Phone (02) 9809 0666

## Executive Summary

Douglas Partners Pty Ltd (DP) has been engaged by CPB Contractors Pty Limited & United Infrastructure Pty Limited Joint Venture (CPBUI JV) to complete this Detailed Site Investigation (Contamination) (DSI) for the Sydney Metro – Western Sydney Airport (SMWSA) Surface and Civil Alignment Works (SCAW) package at Area of Environmental Concern (AEC) 31a.

*Technical Paper 8: Contamination, prepared as part of Sydney Metro - Western Sydney Airport, Environmental Impact Statement (EIS)*, documents areas of environmental concern identified for the Sydney Metro - Western Sydney Airport project. The objective of the DSI is to assess the suitability of AEC 31a and to determine whether further investigation and / or management is required. The site is shown on Drawings AEC31a-01 and AEC31a-02, Appendix A.

It is understood that the site will be subject to a Site Audit by Melissa Porter, a NSW Environment Protection Authority (EPA) Site Auditor accredited under the *Contaminated Land Management Act 1997*.

Field work for the DSI included the collection of soil samples from 33 test pits and seven boreholes; collection of sediment and surface water samples at four sampling points of three dams and a creek; installation of groundwater monitoring wells at three locations; and development and sampling of the groundwater monitoring wells.

At the test pits and shallow boreholes, fill was encountered to depths ranging from 0.05 m to 0.9 m. Fill materials comprised silty sand, sandy silt, or silty clay. Anthropogenic inclusions in fill comprised trace glass, irrigation hose, concrete, gravel, and timber in a number of test pits and boreholes. Fill was underlain by silty clay to test pit / borehole termination depths of between 0.25 m and 1.5 m.

Topsoil / fill (0.3 m and 0.4 m thick AEC31ABH02 and BH03) was encountered in deep boreholes, AEC31ABH01 to AEC31ABH03; silty clay to depths of between 5 m and 9 m; and siltstone to termination depths of between 11.8 m and 15.0 m.

The sediment samples (AEC31ASED1 to AEC31ASED4) were observed to comprise sandy silt / sandy gravel, pale to dark brown with trace rootlets.

Measured groundwater depths ranged between 3.87 m bgl and 9.33 m bgl.

The surface water (AEC31ASW1 to AEC31ASW4) was noted as brown to dark brown, clear / transparent, slightly cloudy with no odour. Some algae and vegetation was covering surface, predominantly around the edges of the dams at sampling points AEC31ASW1 and AEC31ASW2.

Concentrations of chemicals for all analysed soil and sediment samples were below the site assessment criteria (SAC) for all CoPC analysed. Asbestos was not detected in any analysed sample.

Concentrations of contaminants in groundwater and surface water were with the SAC except for some metals (arsenic, chromium, copper, and zinc) and ammonia. The recorded concentrations of metals were considered to be representative of background concentrations and the recorded concentrations of ammonia are not considered to be indicative of groundwater contamination.

Field observations and analysis of soil and groundwater samples has not revealed contamination that requires remediation. Based on the results reported herein, it is considered, from a contamination perspective, that the site (AEC 31a) is suitable for the final intended land use. The tested soils (including tested sediments) are considered suitable to remain on-site.

It is understood that the water in the on-site dams is to be drained. Depending on the water disposal / discharge method, treatment of the dam water for metals and ammonia and possibly other contaminants may be required, along with associated water quality monitoring.

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## Report on Detailed Site Investigation (Contamination)

### Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)

#### Area of Environmental Concern (AEC) 31a, Sweetwater Grove, Orchard Hills

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## 1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by CPB Contractors Pty Limited & United Infrastructure Pty Limited Joint Venture (CPBUI JV) to complete this detailed site investigation (contamination) (DSI) for the Sydney Metro - Western Sydney Airport (SMWSA) Surface and Civil Alignment Works (SCAW) package at Area of Environmental Concern (AEC) 31a.

*Technical Paper 8: Contamination*, prepared as part of *Sydney Metro - Western Sydney Airport, Environmental Impact Statement (EIS)*, documents areas of environmental concern identified for the Sydney Metro - Western Sydney Airport project. The objective of the DSI is to assess the suitability of the part of AEC 31a that will be disturbed by SCAW activities (the site) and to determine whether further investigation and / or management is required. The DSI is not for the entire AEC 31a. The site is shown on Drawings AEC31a-01 and AEC31a-02, Appendix A.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land*, 2020 (NSW EPA, 2020).

It is understood that the site will be subject to a Site Audit by Melissa Porter, a NSW Environment Protection Authority (EPA) Site Auditor accredited under the *Contaminated Land Management Act 1997*.

## 2. Site Identification and Proposed Development

Table 1 provides a summary of information for site identification. The site covers an area of the SCAW package which AEC 31a as shown in Drawings AEC31a-01 and AEC31a-02, Appendix A.

**Table 1: Site Identification Information**

| Item                                    | Details                                                |
|-----------------------------------------|--------------------------------------------------------|
| Site Address (from SIX Maps)            | Sweetwater Grove, Orchard Hills, NSW                   |
| Legal Description (from SIX Maps)       | (Part of) Lot 131, Deposited Plan 1276954              |
| Approximate area of AEC 31a (in EIS)    | 4.6 ha                                                 |
| Approximate site area (within AEC 31 a) | 3.0 ha                                                 |
| Zone (from ePlanning Spatial Viewer)    | ENT: Enterprise<br>Not Zoned along proposed rail line. |
| Local Government Area                   | Penrith City Council                                   |
| Site owner                              | Sydney Metro                                           |

The SCAW package relates to the proposed construction of approximately 10 km of rail alignment between Orchard Hills and the Western Sydney International (future) airport consisting of a combination of viaducts and surface rail. Areas alongside the proposed rail alignment will be used by contractors or for staging and maintenance for the Metro. The alignment of the proposed rail line is shown on Drawing AEC31a-01 and AEC31a-02, Appendix A.

Cardno, *Human Health and Ecological Risk Assessment, Spoil Re-use Sydney Metro and Western Sydney Airport*, 29 June 2021 (80021888 SMSWA HHERARev3-Issued.docx) (Cardno, 2021e) (HHERA) provides (simple) conceptual site models for different general future land uses for the overall SMWSA project. The two general future land uses associated with the SCAW component of the project are considered to be:

- The rail corridor which will include the rail line, embankments / noise barriers, a stabling yard and maintenance facility and Luddenham station; and
- Passive open space. These are areas immediately adjacent to the rail corridor that may be used for bike / commuter paths. It is assumed that there is an absence of buildings in areas of passive open space.

It is presumed that the site will comprise both of the above-listed land uses.

Development of the site will likely include stripping of topsoil and placement of (geotechnically suitable) soil to raise the ground level (up to approximately 10 m above current ground levels) for the surface rail line. Dams will be drained and filled (with dam sediment not intended to be reused as sediment). Stripped topsoil from the site will be subject to reuse elsewhere within the greater SCAW area. Soil to raise ground levels will be sourced from off-site.

Given that soil is to be disturbed at the site as part of the SCAW package, it is assumed that the environmental conservation significance for the small part of the site (in the south) within the area zoned as C2 Environmental Conservation will not be retained.

### 3. Scope of Work

The scope of work for the DSI, was generally based on DP, *Sampling and Analysis Quality Plan (SAQP), Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA) Area of Environmental Concern (AEC) 31a, Sweetwater Grove, Orchard Hills*, August 2022, (204814.01.SAQP.001.Rev0), included the following:

- Collect soil samples from 33 test pits using an excavator;
- Collect soil samples from seven boreholes using hand tools;
- Collect four sediment samples (plus a field replicate) and four surface water samples (plus a field replicate from three dams and a creek using hand tools and disposable bailers;
- Using a drilling rig, three boreholes will be drilled to a (maximum) depth of 15 m or approximately 1.5 m beyond an observed groundwater table (whichever is the lesser) for installation of groundwater monitoring wells. The groundwater monitoring wells will be positioned to provide some site coverage;
- Develop and sample from each of the three groundwater monitoring wells (AEC31ABH01 to BH03);
- Analyse soil, sediment, surface water and groundwater samples for potential contaminants and parameters; and
- Preparation of this DSI including an assessment of analytical and field results.

### 4. Site Condition and Environment Information

Table 2 provides a summary of information relating to the site condition and environment.

**Table 2: Site Condition and Environment Information**

| Item           | Details                                                                                                                                                                                                                                                                                                                                                         |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Geology        | Bringelly Shale (for majority of site): comprising shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.<br>Alluvial / fluvial sediments (at south-east corner of site near Blaxland Creek): comprising fine-grained sand, silt, and clay.<br>(Penrith 1:100,000 Geology Sheet)                      |
| Soil landscape | The majority of the site is at the Blacktown soil landscape which comprises residual soils. The southern end of the site is at the South Creek soil landscape which comprises alluvial soils (Penrith 1:100,000 Soils Landscape Sheet).                                                                                                                         |
| Topography     | The site is at approximately 36 m AHD. Slopes at the northern half of the site are generally down to the north-east. A small valley is present at the northern end of the site. Slopes at the southern half of the site are generally down to the south-east, with the steepest slopes near the south-east corner of the site (NSW 2 m elevation contours map). |

| Item                                     | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Salinity                                 | The southern and northern ends of the site are at areas of high salinity potential. The remainder of site is in an area of moderate salinity potential (Department of Infrastructure Planning and Natural Resources, Salinity Potential in Western Sydney Map).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Acid sulfate soils                       | The site is not within an area or close to an area associated with a risk of acid sulfate soils (NSW Acid Sulfate Soil Risk map).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Surface water bodies                     | <p>Three farm dams are present at the southern end of the site. Another dam is present adjacent to the west of AEC 31a. Refer to Photographs 3 to 6 in Appendix K.</p> <p>An unnamed creek crosses the northern end of the site. The unnamed creek flows into Blaxland Creek which flows adjacent to (approximately 25 m from) the south-east corner of the site.</p> <p>The surface water flow direction across the site and off site may vary based on the elevation contours and nearest water receptors (Blaxland Creek and its tributaries).</p> <p><b>Northern portion of the site:</b> The inferred surface water flow direction across the site and likely flow off-site is north-easterly or easterly; and</p> <p><b>Southern portion of the site:</b> The inferred surface water flow direction across the site and likely flow off-site is south-easterly or easterly.</p> |
| Groundwater flow direction and discharge | Based on topography, shallow groundwater (if any) at the northern half of the site is expected to flow to the north-east and potentially discharge at the unnamed creek. Shallow groundwater (if any) at the southern half of the site is expected to flow to the south-east and discharge at Blaxland Creek. There is the possibility that some groundwater may flow into the dams at the south.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Registered groundwater bores             | There are no registered groundwater bores within 500 m of the site (WaterNSW).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Site use and features                    | <p>The site appears to be used for rural purposes including grazing. Apart from pastoral land and dams, a waste storage area was identified at the site (EIS).</p> <p>Some building rubble was scattered across the site, predominately found in the areas with overgrown long grass and weeds, refer to Photograph 7 in Appendix K. No other major signs of contamination, staining, odours or ACM were visible on the site.</p> <p>The waste storage area noted in the EIS was not present at the time of this investigation with no obvious signs of contamination.</p> <p>Refer to site photographs in Appendix K.</p>                                                                                                                                                                                                                                                            |

| Item                                           | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Surrounding land use and features              | <p>Surrounding land is used for rural purposes and typically comprises grazier land with minor buildings, sheds, animal shelters / pens and dams. Waste storage / dumping areas were identified on nearby land and land located approximately 70 m to the west of the site. Former poultry farm sheds and former potential workshops were identified approximately 100 m to the west of the site. Scattered building rubble, farm equipment piles of building rubble, old vehicles (trucks and cars) were visible on nearby land approximately 250 m to the south-west of the site (downgradient of the site).</p> <p>It is noted that AEC 31b, located approximately 100 m to the east of the site and identified to have potential workshops and potential former hazardous building materials is downgradient of the site. It is also noted that AEC 30, located approximately 15 m to the north of the site, was identified to have a potential workshop and a laydown and stockpile area and is north of the of the site (i.e., to the north of the unnamed creek) (EIS).</p> |
| Information from historical aerial photographs | The land at and surrounding the site appears to have been pastoral land since 1955 (EIS).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NSW EPA records                                | <p>There were no NSW EPA regulated sites (under the Contaminated Land Management Act 1997) within 1 km of the site (EIS).</p> <p>There were no sites notified to the NSW EPA (under the Contaminated Land Management Act 1997) within 500 m of the site (EIS).</p> <p>There were no (current or former) NSW EPA licensed sites (under the Protection of the Environment Operations Act 1997) within 500 m of the site (EIS).</p> <p>There were no NSW EPA PFAS investigation sites within 2 km of the site (EIS).</p> <p>No penalty notices were issued by NSW EPA for the site or nearby surrounding land (EIS).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## 5. Potential Contamination Sources and Preliminary Conceptual Site Model

Potential sources of contamination for AEC 31a were identified in the EIS to be: widespread dumping and storage of waste from drums and bulk storage containers and other wastes including vehicles and unidentifiable items up-gradient of construction footprint; and potential dumping within the construction footprint.

Associated contaminants of potential concern (CoPC) were identified in the EIS to be: heavy metals, total recoverable hydrocarbons (TRH), semi-volatile organic compounds (SVOC), volatile organic compounds (VOC), nutrients, asbestos and other unknown chemicals. DP notes that specific heavy metals, SVOC, VOC and nutrients are not listed in the EIS.

Given that the land at the site does not appear to have been used for intensive farming (crops) requiring the application of fertilisers, it is considered that nutrients (nitrogen and phosphorus) are not a potential soil contaminant at the site even though surface fill / topsoil at the site is anticipated to contain nutrients (nitrogen and phosphorus) as these occur naturally.

Table 3 summarises the potential source of contamination and what are considered to be the contaminants of potential concern for the DSI.

**Table 3: Potential Sources of Contamination and Contaminants of Potential Concern**

| Potential Source of Contamination                                                                                                                                                        | Contaminants of Potential Concern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contaminated ground from waste storage and potential dumping at the site.                                                                                                                | <ul style="list-style-type: none"> <li>Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);</li> <li>Total recoverable hydrocarbons (TRH);</li> <li>Benzene, toluene, ethylbenzene and xylenes (BTEX);</li> <li>Polycyclic aromatic hydrocarbons (PAH);*</li> <li>Organochlorine pesticides (OCP);</li> <li>Organophosphorus pesticides (OPP);</li> <li>Polychlorinated biphenyls (PCB);</li> <li>Phenols;</li> <li>Asbestos;</li> <li>VOC (groundwater); and</li> <li>Ammonia (groundwater).**</li> </ul> |
| Contaminated groundwater or surface water migrating onto the site from land to the west (e.g., former poultry farm and potential workshop)                                               | <ul style="list-style-type: none"> <li>Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc);</li> <li>Total recoverable hydrocarbons (TRH);</li> <li>Benzene, toluene, ethylbenzene, and xylenes (BTEX);</li> <li>Polycyclic aromatic hydrocarbons (PAH);*</li> <li>Organochlorine pesticides (OCP);</li> <li>Organophosphorus pesticides (OPP);</li> <li>Polychlorinated biphenyls (PCB);</li> <li>Phenols;</li> <li>VOC (groundwater); and</li> <li>Ammonia (groundwater).**</li> </ul>                  |
| Contaminated groundwater or surface water migrating onto the site from land to the west (e.g., waste storage / dumping areas of building rubble piles, farm equipment and old vehicles). | <ul style="list-style-type: none"> <li>Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc);</li> <li>Total recoverable hydrocarbons (TRH);</li> <li>Benzene, toluene, ethylbenzene, and xylenes (BTEX);</li> <li>Polycyclic aromatic hydrocarbons (PAH);*</li> <li>Organochlorine pesticides (OCP);</li> <li>Organophosphorus pesticides (OPP);</li> <li>Polychlorinated biphenyls (PCB);</li> <li>Phenols;</li> <li>VOC (groundwater); and</li> <li>Asbestos.</li> </ul>                                 |

Note: \*Based on a review of site history, analysis for a larger suite of SVOC was not considered warranted.

\*\*Ammonia has been adopted as an indicator for potential nutrient contamination

A Conceptual Site Model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site may have become contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e., it enables an assessment of the potential source – pathway – receptor linkages (complete pathways). Table 4 provides the preliminary CSM which forms the basis of the investigation.

**Table 4: Preliminary CSM**

| Potential Contamination Source                                                           | Potential Exposure Pathway                                                                                                                                    | Potential Receptors                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contaminated ground from waste storage and potential dumping at the site.                | <ul style="list-style-type: none"> <li>– Ingestion and direct contact</li> <li>– Inhalation of dust</li> <li>– Inhalation of vapours</li> </ul>               | <ul style="list-style-type: none"> <li>– Construction workers (for the proposed development)</li> <li>– Future site workers including maintenance workers (post-development)</li> <li>– Pedestrians and commuters</li> </ul> |
|                                                                                          | <ul style="list-style-type: none"> <li>– Inhalation of dust</li> <li>– Inhalation of vapours</li> </ul>                                                       | <ul style="list-style-type: none"> <li>– Adjacent site users</li> </ul>                                                                                                                                                      |
|                                                                                          | <ul style="list-style-type: none"> <li>– Surface run-off</li> <li>– Leaching of contaminants into groundwater and lateral migration of groundwater</li> </ul> | <ul style="list-style-type: none"> <li>– Surface water bodies</li> </ul>                                                                                                                                                     |
|                                                                                          | <ul style="list-style-type: none"> <li>– Leaching of contaminants into groundwater</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>– Groundwater</li> </ul>                                                                                                                                                              |
|                                                                                          | <ul style="list-style-type: none"> <li>– Ingestion, inhalation, and direct contact</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>– Terrestrial ecosystems</li> </ul>                                                                                                                                                   |
|                                                                                          | <ul style="list-style-type: none"> <li>– Direct contact</li> </ul>                                                                                            | <ul style="list-style-type: none"> <li>– In ground structures</li> </ul>                                                                                                                                                     |
| Contaminated groundwater or surface water migrating onto the site from land to the west. | <ul style="list-style-type: none"> <li>– Ingestion and direct contact</li> <li>– Inhalation of vapours</li> </ul>                                             | <ul style="list-style-type: none"> <li>– Construction workers (for the proposed development)</li> <li>– Future site workers including maintenance workers (post-development)</li> <li>– Pedestrians and commuters</li> </ul> |
|                                                                                          | <ul style="list-style-type: none"> <li>– Ingestion, inhalation, and direct contact</li> </ul>                                                                 | <ul style="list-style-type: none"> <li>– Terrestrial ecosystems</li> </ul>                                                                                                                                                   |

Although *Table B2: Activities associated with PFAS contamination more broadly* of Appendix B of HEPA, *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020) lists ‘*Agriculture: Potentially used as an adjuvant or active ingredient in fertilisers and pesticides....*’, it is considered that investigation for PFAS is not warranted given that crops did not appear to be established at the site, and, thus, there is a low probability that substantial fertiliser application has occurred. In addition, although there are off- site former poultry farm sheds (noted on Table 2), it is considered that there is a very low probability of this being a potential source of PFAS contamination as firefighting foam application to destroy infected flocks would only be used for large flocks with highly infectious disease (e.g., avian influenza) and there is no information to suggest this activity has occurred near the site.

## 6. Field Work

### 6.1 Data Quality Objectives

The DSI was devised with reference to the seven-step data quality objective process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix C.

### 6.2 Soil Sampling

Based on the CSM and data quality objectives (DQO), a broad grid sampling strategy was adopted to provide data across the site. A sample density of 40 soil sample points was based on the minimum recommended sample density for a 3-ha site in Table 2 of NSW EPA, *Sampling Design Part 1 - application, Contaminated Land Guidelines*, August 2022 (NSW EPA, 2022). Soil samples from 33 sample points (AEC31ATP01 to AEC31ATP33) were collected using an excavator. Soil samples from seven sample points (AEC31AHA34 to AEC31AHA40) were collected using a hand auger as these were inaccessible to an excavator given the presence of vegetation. One test pit, AEC31ATP20, was positioned to target the former waste and drum storage area identified in the EIS (as per the SAQP). Sample locations are shown on Drawings AEC31a-01 and AEC31a-02 in Appendix A.

It is noted that AEC31ATP22 was positioned on the site boundary and AEC31ATP20 was slightly outside the site boundary. Although these pits were not positioned within the site, the data from these pits is considered to provide information with regard to the overall site assessment, particularly as AEC31ATP20 is within the former waste and drum storage area.

Sampling from test pits was carried out on 8 and 9 December 2022. Sampling using a hand auger was carried out on 16 December 2022.

It is noted that the number of sampling points is slightly greater than that listed in the SAQP, as the site boundary had been slightly adjusted (i.e., expanded) since issue of the SAQP.

Soil sampling was carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures is as follows:

- Collect soil samples from excavator bucket returns or hand auger including at the surface / near surface and regular depth intervals (approximately every 0.5 m) and / or at changes of strata;

- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for screening using a photo-ionisation detector (PID);
- For fill samples, collect ~500 ml samples in zip-lock bags (for asbestos analysis);
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

It is noted that as potential ACM or copious quantities of building rubble were not observed in fill, 10 L bulk samples were not collected for sieving / screening for asbestos assessment.

### 6.3 Sediment Sampling

Sediment sampling of the farm dams and a creek in AEC 31a (samples AEC31ASED1 to AEC31ASED4), prior to dewatering and was carried out on 17 January 2023 in accordance with DP standard operating procedures. Sample locations are shown on Drawings AEC31a-01 and AEC31a-02 in Appendix A.

The general sampling and sample management procedures is as follows:

- Collect sediment sample from an accessible point using stainless steel hand tools. The sediment samples were recovered at depths of between 0.0 m and 0.1 m below the base of the dams;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~500 ml samples for asbestos analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated, and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

For soil and sediment sampling, to avoid the need for decontaminating sampling equipment, disposable nitrile gloves were changed between each sampling event and used for sample collection.

## 6.4 Surface Water Sampling

Surface sampling of the farm dams and a creek in AEC31a (samples: AEC31ASW1 to AEC31ASW4) was carried out on 24 January 2023 in accordance with DP standard operating procedures. Sample collection was completed using disposable bailers. A new pair of disposable nitrile gloves were worn at each sample site to minimise potential for cross-contamination. The sampling method is described as follows:

- Sample location in the farm dam in AEC 31a at a reasonable distance from the edge (as shown on Drawings AEC31a-01 and AEC31a-02 in Appendix A);
- Immerse sample container to at least 1 m below the surface (if possible), with the opening pointing directly down to maintain a volume of air in the container, thereby avoiding the collection of any surface films;
- Once under the surface of the water, point the mouth of the sample container up stream so that gloved hands, sample container and / or sample collection device are downstream of the sample being collected;
- If the water is still, move the sample container forward away from the sampler and any equipment to collect a continuous uncontaminated sample;
- Use a sample location specific laboratory-prepared glass bottle without preservatives;
- Decant the water sample into laboratory-prepared bottles, minimising headspace within the sample bottle and cap immediately. The sample location specific laboratory-prepared glass bottle can be used as the sample container for the last sample from that location;
- Place samples into a cooled, insulated, and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

## 6.5 Groundwater Monitoring Well Installation and Development

Boreholes for groundwater monitoring wells (AEC31ABH01 to AEC31ABH03) were drilled to depths of between 11.8 m and 15.0 m on 2 February 2023 using a track-mounted drilling rig with solid flight auger and tc-bit attachment. The wells were positioned to provide general site coverage as per proposed locations in the SAQP.

Monitoring wells were constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well was backfilled with a washed sand filter pack to approximately 1 m above the screened interval. Each well was completed with a hydrated bentonite plug of approximately 2 m thickness and then backfilled to the surface.

The three groundwater monitoring wells were developed on 6 February 2023 using a Twister (plastic) pump.

## 6.6 Groundwater Well Sampling

Groundwater sampling of the groundwater monitoring wells (AEC31ABH01 to AEC31ABH03) was carried out on 13 February 2023 in accordance with DP standard operating procedures. The sampling method adopted is as follows:

- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Measure the static water level using an electronic interface probe;
- Lower the well-dedicated tubing into the well at a depth that is at the screened section of the well;
- Set up the peristaltic pump to draw water at a low rate that produces laminar flow;
- Measure physical parameters by continuously passing the purged water through a flow cell;
- Following stabilisation of the field parameters using a water quality meter, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately. Samples for metals analysis are filtered in the field using a 0.45 µm filter (prior to bottling of the sample);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

Field sheets for groundwater sampling are provided in Appendix H.

## 7. Laboratory Analysis

### 7.1 Soil Samples from Test Pits and Shallow Boreholes

Fill or topsoil (primary) samples from each test pit location were analysed at a NATA accredited laboratory for the CoPC (see Table 3) comprising: metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRH, BTEX, PAH, OCP, OPP, PCB, total / speciated phenols and asbestos (in 500 ml of soil) as fill / surface soil was considered to have a greater risk of contamination compared to the observed natural soil. Natural soil samples from seven sample locations (AEC31ATP01, AEC31ATP10, AEC31ATP20, AEC31ATP28, AEC31AHA35, AEC31AHA38 and AEC31AHA39) and various depths beneath fill / topsoil were analysed for the same suite of CoPC excluding asbestos to obtain some data for the natural profile across the site.

Laboratory certificates and chain of custody are provided in Appendix D.

### 7.2 Sediment Samples from Dam

The sediment samples were analysed at a NATA accredited laboratory for the CoPC (see Table 3) comprising: metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc), TRH, BTEX, PAH, OCP, OPP, PCB, total phenols and asbestos (in 500 ml of soil).

### 7.3 Surface Water Samples

Four surface water samples from sampling points, AEC31ASW1 to AEC31ASW4 were analysed for CoPC comprising metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), PAH, TRH, BTEX, VOC, OCP, OPP, PCB, speciated phenols, ammonia. Hardness was also analysed for the calculation of hardness adjusted default guideline values (DGV). (Samples were also analysed for pH, chlorides, sulphates, cations / anions, TDS, carbonate / bicarbonates, electrical conductivity and Langelier saturation index for geotechnical purposes and results for these have not been reported herein).

### 7.4 Groundwater Samples

Three groundwater samples from groundwater monitoring wells, AEC31ABH01 to AEC31ABH03 were analysed for CoPC comprising metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), PAH, TRH, BTEX, VOC, OCP, OPP, PCB, speciated phenols and ammonia. Hardness was also analysed for the calculation of hardness adjusted default guideline values (DGV). (Samples were also analysed for pH, chlorides, sulphates, cations / anions, TDS, carbonate/bicarbonates, electrical conductivity and Langelier saturation index for geotechnical purposes and results for these have not been reported herein).

## 8. Site Assessment Criteria

Tier 1 Site Assessment Criteria (SAC) for the assessment of soils and water, informed by the CSM, at the site are listed in Appendices E and F.

Given that the future use of the site is presumed to be for passive open space, the SAC for passive open space (land use C) apply for assessment of the site (AEC 31a). Given that soil at the site may be used at other areas of the SCAW project including for the proposed rail corridor (as well as other areas of passive open space), SAC for the rail corridor (land use corridor D) have been included as part of the assessment.

## 9. Field Work Results

### 9.1 Soil - Test Pits and Shallow Boreholes

The test pit and borehole logs for this assessment are included in Appendix G and should be referenced for detailed soil descriptions. In summary:

- Either topsoil or fill comprising silty sand, sandy silt or silty clay was encountered at all test pits and shallow boreholes, between 0.05 m and 0.9 m thick. Shallow boreholes AEC31AHA34, AEC31AHA36 and AEC31AHA refused on tree roots within fill.
- Anthropogenic inclusions in fill comprised trace glass, irrigation hose, concrete, gravel and timber in test pits: AEC31ATP02, AEC31ATP08, AEC31ATP10, AEC31ATP14, AEC31ATP21, AEC31ATP22, AEC31ATP23, AEC31ATP28, AEC31ATP29, AEC31ATP31, AEC31ATP32, AEC31ATP33 and AEC31AHA40.
- Topsoil / fill was underlain by silty clay, to termination depths of between 0.25 m and 1.5 m.

PID results were less than 5 ppm, indicating a low potential for the presence of volatile contaminants.

No signs of contamination (e.g., odour, staining or potential asbestos-containing material) were observed during sampling.

No free groundwater was observed at the test pits. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

### 9.2 Sediment Samples

The sediment samples (AEC31ASED1 to AEC31ASED4) were taken on 24 January 2023 and recorded as sandy silt / sandy gravel, pale to dark brown with trace rootlets. No signs of contamination were observed during sampling.

### 9.3 Surface Water Samples

The surface water (AEC31ASW1 to AEC31ASW4) was sampled on 24 January 2023 and was noted as brown to dark brown, clear / transparent, slightly cloudy with no odour. Some algae and vegetation was covering surface, predominantly around the edges of the dams at sampling points AEC31ASW1 and AEC31ASW2.

### 9.4 Groundwater Boreholes

The borehole logs for this assessment are included in Appendix G. Boreholes for groundwater monitoring wells AEC31ABH01 to BH03 were drilled through a surface layer of topsoil / fill (0.3 m and 0.4 m thick AEC31ABH02 and BH03), then silty clay to depths of between 5 m and 9 m, then siltstone to termination depths (between 11.8 m and 15.0 m). No signs of contamination were noted whilst drilling.

No groundwater seepage was observed whilst drilling groundwater monitoring wells, AEC31ABH01 to BH03. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

## 9.5 Groundwater Well Development and Sampling

The groundwater levels prior to sampling were as follows:

**Table 5: Potential Source of Contamination and Contaminants of Potential Concern**

| Borehole    | Prior to Well Development    |                              | Prior to Well Sampling       |                              |                                                |
|-------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------------------------|
|             | 6/2/2023                     |                              | 13/2/2023                    |                              |                                                |
|             | Groundwater Depth<br>(m bgl) | Groundwater Level<br>(m AHD) | Groundwater Depth<br>(m bgl) | Groundwater Level<br>(m AHD) | Sample Appearance                              |
| AEC31A-BH01 | 2.56                         | 33.94                        | 9.33                         | 27.17                        | Cloudy, pale brown and no odour                |
| AEC31A-BH02 | 6.33                         | 29.97                        | 7.25                         | 29.05                        | Cloudy, pale brown, low turbidity and no odour |
| AEC31A-BH03 | 1.38                         | 31.62                        | 3.87                         | 29.13                        | Clear, cloudy, low turbidity and no odour      |

The groundwater field sheets, and water quality meter calibration record are provided in Appendix H.

Remnant drilling fluid from drilling may have caused abnormally high groundwater levels prior to well development. The groundwater recharge rate was slow during development, indicating low soil permeability.

Overall, the groundwater levels are expected to fluctuate due to changing climatic conditions.

## 10. Discussion of Laboratory Analytical Results

### 10.1 *In situ* Soil Samples

Analytical results for soil samples are summarised in Table I1, Appendix I, against the most conservative (Tier 1) SAC (see Appendix E).

Concentrations of metals, TRH, BTEX, PAH, phenols, OCP, OPP and PCB were within the SAC. It is noted that concentrations of metals (cadmium and mercury), TRH C<sub>6</sub>-C<sub>10</sub>, TRH >C<sub>10</sub>-C<sub>16</sub>, TRH >C<sub>34</sub>-C<sub>40</sub>, BTEX, PAH, phenols, OCP, OPP and PCB were less than the practical quantitation limits.

Asbestos was not detected in any analysed sample.

## 10.2 Sediment Samples

Analytical results for sediment samples (AEC31ASED1 to AEC31ASED4) are summarised in Table I1, Appendix I, against the Tier 1 SAC (see Appendix E).

Concentrations of metals, TRH, BTEX, PAH, phenols, OCP, OPP and PCB were within the SAC. It is noted that concentrations of metals (cadmium and mercury), TRH, BTEX, PAH, phenols, OCP, OPP and PCB were less than the practical quantitation limits.

No asbestos was detected in the sediment samples.

## 10.3 Surface Water Samples

Analytical results for the surface water samples (AEC31ASW1 to AEC31ASW4) are summarised in Table I3, Appendix I against the Tier 1 SAC (see Appendix F).

Concentrations of metals, TRH, BTEX, PAH, speciated phenols, OCP, OPP and PCB were within the SAC apart from elevated concentrations of arsenic, chromium, and copper. Elevated levels of chromium and copper were also identified in groundwater samples, and the elevated levels of arsenic, chromium and copper are considered to most likely be reflective of background levels.

It is noted that concentrations of metals (cadmium and mercury), PAH, OCP, OPP and PCB were less than the practical quantitation limits.

Detectable concentrations of TRH C<sub>6</sub>-C<sub>10</sub>, TRH >C<sub>10</sub>-C<sub>16</sub>, TRH >C<sub>16</sub>-C<sub>34</sub> and TRH >C<sub>34</sub>-C<sub>40</sub> were identified in the surface water samples. Following silica gel clean up, or the removal of polar metabolite compounds (i.e., organic content), the levels of TPH were below the practical quantitation limits apart from TRH >C<sub>16</sub>-C<sub>34</sub> (160 mg/kg) in the surface water sample, AEC31ASW1. Subsequent silica gel clean up test indicated the TRH were broadly attributed to the naturally occurring organic content present in the samples. Algae blooms at sampling points, AEC31ASW1 and AEC31ASW2 were observed and dense vegetation growth surrounding sampling points, AEC31ASW3 and AEC31ASW4 were noticed during the sampling event, refer to site photographs in Appendix K.

Ammonia was detected in all surface water samples with a sample, AEC31ASW2, and its field replicate sample, BD3130230124, exceeding the DGV for fresh water (900 µg/L for pH 8.0). It is noted, however, that the water at AEC31ASW2 had a pH of 6.3 in the field and, according to the Ammonia technical brief (on the ANZG, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* website), the freshwater trigger value is 2520 µg/L for pH 6.3. The recorded concentrations at AEC31ASW2 are marginally above this trigger value. In addition to the samples from AEC31ASW2, field replicate, BD220230124, of primary sample AEC31ASW1, exceeded the aesthetic criterion for recreational water (382 µg/L for ammonia as N).

## 10.4 Groundwater Samples

Analytical results for groundwater samples from the three wells are summarised in Table I3, Appendix I, against the SAC (see Appendix F). Groundwater levels varied from 3.87 m to 9.33 m depth below ground surface, therefore health screening levels (HSL) for vapour intrusion at depth 2 m to <4 m are shown as a tier 1 assessment. Default guideline values (DGV) for metals have been adjusted for hardness where possible.

Concentrations of metals, TRH, BTEX, PAH, speciated phenols, OCP, OPP and PCB were within the SAC apart from chromium and copper levels in samples AEC31ABH01 and AEC31ABH02. Elevated levels of chromium and copper were detected in groundwater samples, AEC31ABH01 and AEC31ABH02 and their replicate samples, BD1/20230213 and BD2/20230213. Elevated concentrations of chromium and copper are considered to most likely be reflective of background levels.

It is noted that concentrations of metal (mercury), TRH, BTEX, OCP, OPP, PCB and speciated phenols were less than the practical quantitation limits.

Ammonia was detected in all groundwater samples with samples, AEC31ABH01 and its field replicate sample, BD1/20230213, AEC31ABH02 and AEC31ABH03 and its field replicate sample, BD3130230124, exceeding the aesthetic criterion for recreational water (382 µg/L for ammonia as N). The ammonia concentrations in groundwater samples were, however, within the DGV for fresh water. The recorded concentrations of ammonia are not considered to be indicative of groundwater contamination.

## 10.5 Preliminary Waste Classification Comments

Although it is understood that excavated soil is to be reused within the SCAW project, preliminary waste classification comments are provided below in the eventuality that spoil is to be disposed to landfill or is not to be reused for the SCAW project.

Table I2, Appendix I presents the analytical results for the current investigation against criteria from NSW EPA, *Waste Classification Guidelines*, 2014 (NSW EPA, 2014) and NSW EPA, *The excavated natural material order 2014*.

With respect to topsoil and fill, concentrations of chemical contaminants were within the CT1 criteria for general solid waste. Asbestos was not identified in fill during sampling or from laboratory analysis. On the basis of laboratory and field results, fill at the site (as described in the logs, Appendix G) has a preliminary classification as general solid waste (non-putrescible). This preliminary waste classification does not apply to any fill that is encountered to be different to those sampled and tested or exhibit signs of potential contamination (e.g., ACM, staining or odours). It is noted that concentrations of metals, TRH, BTEX, PAH and pH are within the criteria for ENM.

With respect to natural soil samples, concentrations of chemical contaminants were within what are considered to be background levels which are considered to be consistent with the definition of virgin excavated natural material (VENM), as defined in Protection of the Environment Operations Act 1997.

## 10.6 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA / QC) results are included in Appendix J. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

## 11. Conclusion

Analysis of soil, sediment, surface water and groundwater samples has not revealed the presence of contamination that requires remediation. Based on the results of sampling and site observations reported herein, it is considered, from a contamination perspective, that the site (at AEC31A) is suitable for the final intended land use. The tested soils (including tested sediments) are considered suitable to remain onsite.

It is understood that the water in the on-site dams is to be drained. Depending on the water disposal / discharge method, treatment of the dam water for metals and ammonia and possibly other contaminants may be required, along with associated water quality monitoring.

## 12. Limitations

Douglas Partners (DP) has prepared this report (or services) for the SCAW package for SMWSA. The work was carried out under a Service Contract. This report is provided for the exclusive use of CPBUI JV for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and / or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and / or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and / or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

Asbestos has not been detected in laboratory analysis of soil samples. Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints, or to parts of the site being inaccessible and not available for inspection / sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that hazardous building materials (HBM), including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

The assessment of atypical safety hazards arising from this advice is restricted to the (environmental) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

DP personnel are not licenced or accredited surveyors. Any quantities quoted in this report are provided for general guidance only and should not be relied upon. The services of a licenced/accredited surveyor should be engaged if reliable quantities are required.

The handling, transport and disposal of the waste should be conducted in accordance with regulatory and statutory requirements. DP does not accept liability for the unlawful disposal of waste materials from any site. DP accepts no responsibility for the material tracking, loading, management, transport, or disposal of waste from the site. Both the receiving site and the site disposing of the soil should satisfy the requirements of the licence before disposal of the soil is undertaken. Note that appropriate prior arrangement with the receiving site / relevant authorities should be obtained prior to the disposal of any soil off site. The receiving site should check to ensure that the soil received matches the description provided in this report and contains no cross contamination.

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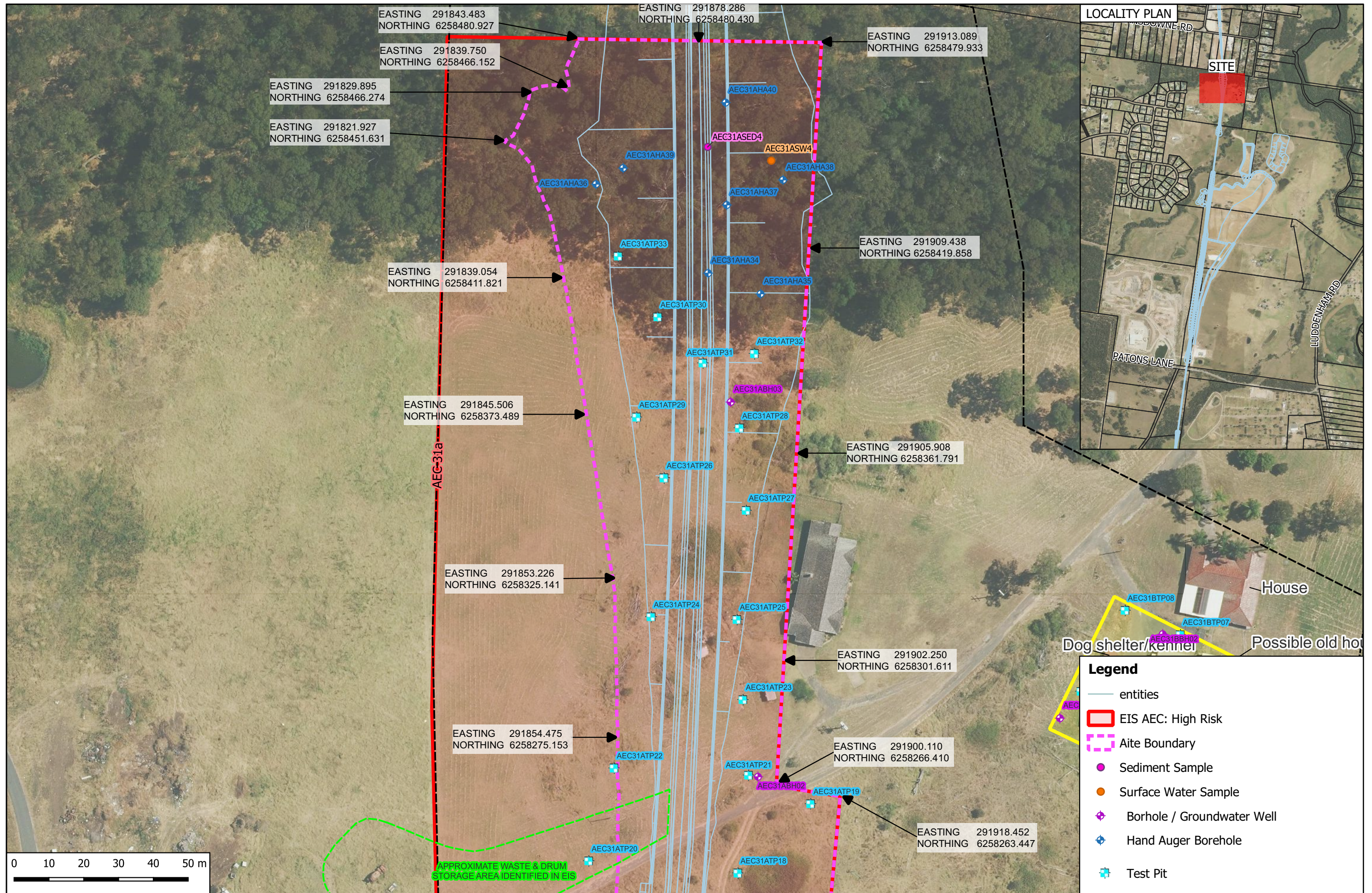
**Douglas Partners Pty Ltd**

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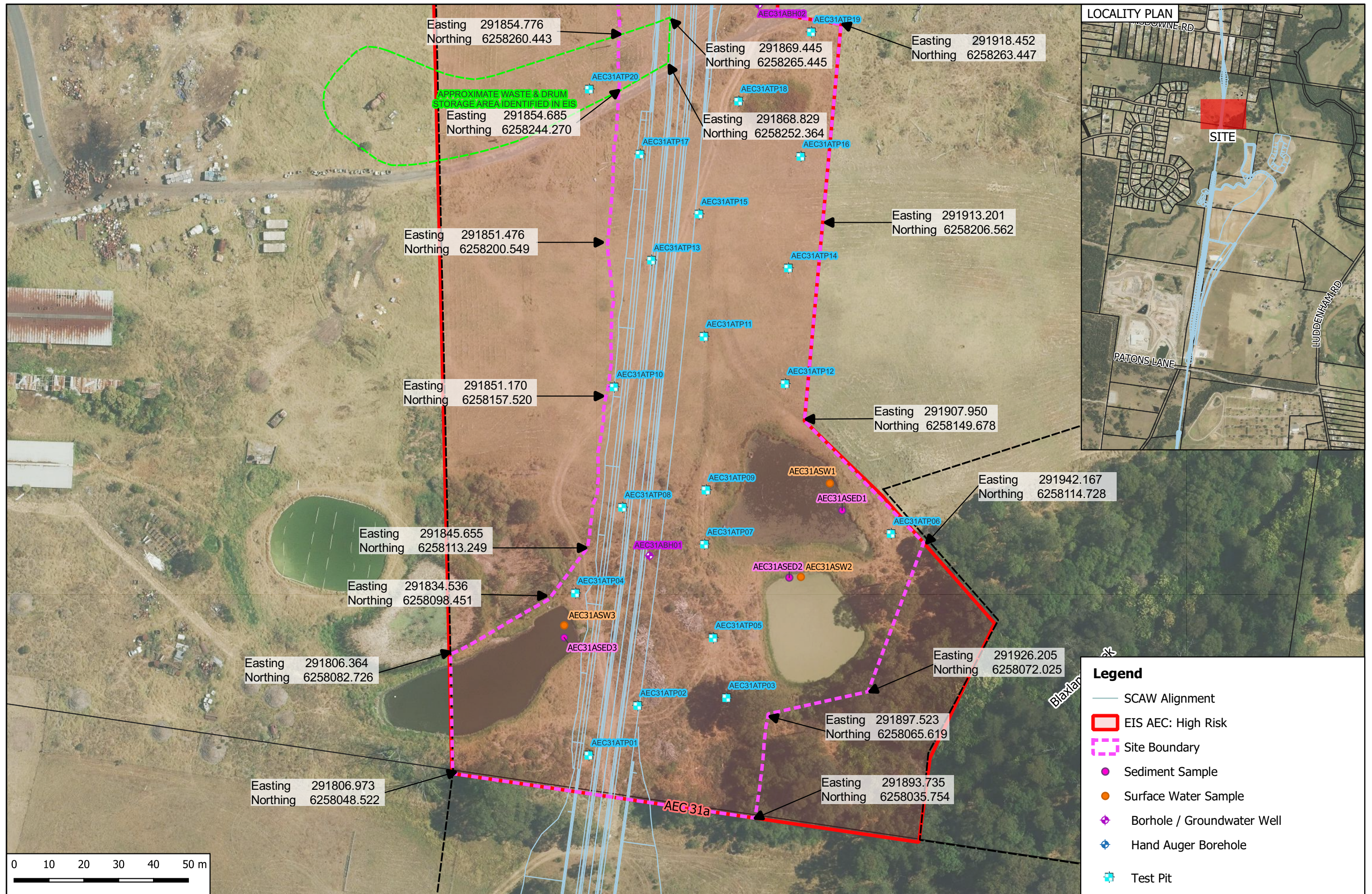
## Appendix A

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Drawings



|                                                                                                                                                        |                    |                  |                                                                                                                                        |                                                                                       |                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------|
|  <b>Douglas Partners</b><br>Geotechnics   Environment   Groundwater | CLIENT: CPBUI JV   |                  | TITLE: <b>AEC31a Test Location Plan</b><br><b>Sydney Metro Western Sydney Airport - SCAW</b><br><b>Sweetwater Grove, Orchard Hills</b> |  | PROJECT No: 204814.01 |
|                                                                                                                                                        | OFFICE: Sydney     | DRAWN BY: MG     |                                                                                                                                        |                                                                                       | DRAWING No: AEC31a-01 |
|                                                                                                                                                        | SCALE: 1:1000 @ A3 | DATE: 04/05/2023 |                                                                                                                                        |                                                                                       | REVISION: 0           |



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## Appendix B

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About this Report

# About this Report

# Douglas Partners



## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

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

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

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

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole 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. They may not be the same at the time of construction as are indicated in the report; 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 first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or 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 a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

# *About this 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, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

## **Information for Contractual Purposes**

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

## **Site Inspection**

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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## Appendix C

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Data Quality Objectives

## Data Quality Objectives

### DSI for AEC31a, Sweetwater Grove, Orchard Hills

### SCAW Package for SMWSA

As shown in the table below, the DSI has been devised broadly in accordance with the seven-step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

| Step                                          | Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1: State the problem                          | <p>The problem to be addressed is that the extent and nature of potential contamination at the site is unknown and it is unclear whether the site is suitable for the proposed uses.</p> <p>The objective of the DSI is to determine the contamination status of the site with respect to the proposed land use and, if contamination is confirmed, to make recommendations for further investigations and / or remediation to render the site suitable for the proposed uses.</p> <p>In addition, soil from the site may potentially be reused elsewhere within SCAW and the data obtained in the DSI, therefore, may also be used for this purpose.</p> <p>A preliminary conceptual site model (CSM) has been prepared for the proposed development.</p> <p>The proposed project team consists of experienced environmental engineers and scientists.</p> |
| 2: Identify the decisions / goal of the study | <p>The site history has identified possible contaminating previous uses which are identified in the preliminary CSM. The SAC for potential contaminants are provided in Appendices E and F.</p> <p>The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.</p>                                                                                                                                                                                                                                                                                                      |
| 3: Identify the information inputs            | <p>Inputs to the investigation will be the results of analysis of samples to measure the concentrations of potential contaminants at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the potential contaminants are provided in Appendices E and F.</p> <p>A photoionisation detector (PID) is used on-site to screen soils for volatile contaminants. PID readings will be used to inform sample selection for laboratory analysis.</p>                                                                                                                                                                                                                                                                                                                                                                       |
| 4: Define the study boundaries                | <p>The site is identified in section 2. The lateral boundaries of the investigation area are shown on Drawings AEC31a-01 and AEC31a-02 in Appendix A.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Step                                                  | Summary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5: Develop the analytical approach (or decision rule) | <p>The decision rule is to compare all analytical results with SAC.</p> <p>Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s).</p> <p>Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6: Specify the performance or acceptance criteria     | <p>Baseline condition: Contaminants at the site and/or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis).</p> <p>Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis).</p> <p>Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.</p> <p>Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows:</p> <ul style="list-style-type: none"> <li>As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e., 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95%UCL shall subsequently be screened against the corresponding SAC.</li> <li>The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.</li> </ul> |
| 7: Optimise the design for obtaining data             | <p>As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas.</p> <p>Further details regarding the proposed sampling plan are presented in the DSI.</p> <p>Adequately experienced environmental scientists / engineers are chosen to conduct field work and sample analysis interpretation.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

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## **Appendix D**

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### Laboratory Certificates and Chain of Custody

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## **Appendix E**

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### Site Assessment Criteria – Soil

## Site Assessment Criteria for Soil for AEC31a

### Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)

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#### 1.0 Introduction

It is understood that the two general future land uses associated at the site will comprise:

- The rail corridor. The rail corridor will include the rail line, embankments / noise barriers, a stabling yard and maintenance facility and stations; and
- Passive open space. These are areas immediately adjacent to the rail corridor that may be used for bike / commuter paths. It is assumed that there is an absence of buildings in areas of passive open space.

The following references were consulted for deriving 'Tier 1' SAC for soil for the two above-listed land uses:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)* [NEPM] (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater, 2011* (CRC CARE, 2011).
- HEPA, *PFAS National Environmental Management Plan, 2020* [NEMP] (HEPA, 2020).

#### 2.0 Human Health-based Criteria

Human health-based SAC for soil and the associated future land uses are listed in Tables 1 to 5. Tier 1 criteria comprise:

- Health Investigation Levels (HIL) for a broad range of metals and organics (Table 1). HIL are applicable for assessing human health risk via all relevant pathways of exposure;
- Health Screening Levels (HSL) for vapour intrusion for selected petroleum hydrocarbons and fractions (Tables 2 and 3). These are applicable for assessing human health via the inhalation pathway. HSL are dependent on soil type and depth. HSL D are applicable to soil / areas to be covered by buildings (e.g., stations, offices and enclosed sheds);
- HSL for direct contact for selected petroleum hydrocarbons and fractions (Table 4). These are applicable for assessing human health via the direct contact pathway; and
- Health screening levels for asbestos (Table 5).

For HSL for vapour intrusion, HSL for clay soils are shown as these are the predominant soil types at the site.

**Table 1: Health Investigation Levels (Tier 1) from NEPM**

| Contaminant                                   | HIL C for Passive Open Space (mg/kg) | HIL D for Rail Corridor (mg/kg) |
|-----------------------------------------------|--------------------------------------|---------------------------------|
| <b>Metals and Inorganics</b>                  |                                      |                                 |
| Arsenic                                       | 300                                  | 3000                            |
| Cadmium                                       | 90                                   | 900                             |
| Chromium (VI)                                 | 300                                  | 3600                            |
| Copper                                        | 17 000                               | 240 000                         |
| Lead                                          | 600                                  | 1500                            |
| Mercury (inorganic)                           | 80                                   | 730                             |
| Nickel                                        | 1200                                 | 6000                            |
| Zinc                                          | 30 000                               | 400 000                         |
| <b>Polycyclic Aromatic Hydrocarbons (PAH)</b> |                                      |                                 |
| Benzo(a)pyrene TEQ                            | 3                                    | 40                              |
| Total PAH                                     | 300                                  | 4000                            |
| <b>Phenols</b>                                |                                      |                                 |
| Phenol                                        | 40 000                               | 240 000                         |
| Pentachlorophenol                             | 120                                  | 660                             |
| Cresols                                       | 4000                                 | 25 000                          |
| <b>Organochlorine Pesticides (OCP)</b>        |                                      |                                 |
| DDT+DDE+DDD                                   | 400                                  | 3600                            |
| Aldrin and dieldrin                           | 10                                   | 45                              |
| Chlordane                                     | 70                                   | 530                             |
| Endosulfan                                    | 340                                  | 2000                            |
| Endrin                                        | 20                                   | 100                             |
| Heptachlor                                    | 10                                   | 50                              |
| HCB                                           | 10                                   | 80                              |
| Methoxychlor                                  | 400                                  | 2500                            |
| <b>Organophosphorus Pesticides (OPP)</b>      |                                      |                                 |
| Chlorpyrifos                                  | 250                                  | 2000                            |
| <b>Polychlorinated Biphenyls (PCB)</b>        |                                      |                                 |
| PCB                                           | 1                                    | 7                               |

**Table 2: Health Screening Levels (Tier 1) for Vapour Intrusion for Passive Open Space from NEPM**

| Contaminant                   | HSL C (mg/kg)         |
|-------------------------------|-----------------------|
| <b>CLAY</b>                   | <b>0 m to &lt;1 m</b> |
| Benzene                       | NL                    |
| Toluene                       | NL                    |
| Ethylbenzene                  | NL                    |
| Xylenes                       | NL                    |
| Naphthalene                   | NL                    |
| TPH C6-C10 less BTEX          | NL                    |
| TPH >C10-C16 less naphthalene | NL                    |

Notes: TPH is total petroleum hydrocarbons

The soil saturation concentration (C<sub>sat</sub>) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds C<sub>sat</sub>, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

**Table 3: Health Screening Levels (Tier 1) for Vapour Intrusion for Rail Corridor from NEPM**

| Contaminant                   | HSL D (mg/kg)         |
|-------------------------------|-----------------------|
| <b>CLAY</b>                   | <b>0 m to &lt;1 m</b> |
| Benzene                       | 4                     |
| Toluene                       | NL                    |
| Ethylbenzene                  | NL                    |
| Xylenes                       | NL                    |
| Naphthalene                   | NL                    |
| TPH C6-C10 less BTEX          | 310                   |
| TPH >C10-C16 less naphthalene | NL                    |

**Table 4: Health Screening Levels (Tier 1) for Direct Contact from CRC CARE (2011)**

| Contaminant                   | HSL C for Passive Open Space (mg/kg) | HSL D for Rail Corridor (mg/kg) |
|-------------------------------|--------------------------------------|---------------------------------|
| Benzene                       | 120                                  | 430                             |
| Toluene                       | 18 000                               | 99 000                          |
| Ethylbenzene                  | 5300                                 | 27 000                          |
| Xylenes                       | 15 000                               | 81 000                          |
| Naphthalene                   | 1900                                 | 11 000                          |
| TPH C6-C10 less BTEX          | 5100                                 | 26 000                          |
| TPH >C10-C16 less naphthalene | 3800                                 | 20 000                          |
| TPH >C16-C34                  | 5300                                 | 27 000                          |
| TPH >C34-C40                  | 7400                                 | 38 000                          |

Notes: TPH is total petroleum hydrocarbons.

**Table 5: Health Screening Levels (Tier 1) for Asbestos from NEPM**

| Form of Asbestos                                                 | Health Screening Level C for Passive Open Space | Health Screening Level D for Rail Corridor |
|------------------------------------------------------------------|-------------------------------------------------|--------------------------------------------|
| Bonded asbestos containing materials (ACM)                       | 0.02%                                           | 0.05%                                      |
| Fibrous asbestos (FA) and asbestos fines (AF) (friable asbestos) | 0.001%                                          | 0.001%                                     |
| All forms of asbestos                                            | No visible asbestos for surface soil            | No visible asbestos for surface soil       |

Notes: FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).  
 AF includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.  
 Surface soils defined as top 10 cm.

### 3.0 Ecological Criteria

Ecological SAC for soil and the associated future use are listed in Tables 6 and 7. Tier 1 criteria comprise:

- Ecological Investigation Levels (EIL) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene (Table 6). These are derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website and are used to assess contamination with respect to terrestrial ecosystems. Site specific inputs (including soil parameters) are required to calculate EIL. EIL typically apply to the top 2 m of soil; and
- Ecological Screening Levels (ESL) for selected petroleum hydrocarbon compounds and fractions, and benzo(a)pyrene, and are used to assess contamination with respect to terrestrial ecosystems (Table 7). ESL are dependent on soil type and typically apply to the top 2 m of soil.

EIL were determined using the NEPC Ecological Investigation Level Spreadsheet based on the following inputs:

- A pH of 6.0 which is the average pH of the six analysed soil samples (see laboratory certificates 313553 and 312920); and
- A Cation Exchange Capacity (CEC) of 10.0 meq/100 g which is the average CEC for the six analysed soil samples (see laboratory certificates 313553 and 312920);
- Contamination is assumed to be 'aged' based on site history;
- A organic carbon content value of 1% has been used as a default value;
- A clay content of 1% has been used as a relatively conservative value; and
- The state is NSW and the traffic volume is 'low'.

Clay and sand soils were encountered during the investigation and, so, ESL for fine and coarse soils have been adopted.

**Table 6: Ecological Investigation Levels (Tier 1) from NEPM toolbox**

| Contaminant   | Public Open Space EIL for Passive Open Space (mg/kg) | Commercial and Industrial EIL for Rail Corridor (mg/kg) |
|---------------|------------------------------------------------------|---------------------------------------------------------|
| <b>Metals</b> |                                                      |                                                         |
| Arsenic       | 100                                                  | 160                                                     |
| Copper        | 210                                                  | 300                                                     |
| Nickel        | 170                                                  | 290                                                     |
| Chromium III  | 190                                                  | 320                                                     |
| Lead          | 1100                                                 | 1800                                                    |
| Zinc          | 480                                                  | 700                                                     |
| <b>PAH</b>    |                                                      |                                                         |
| Naphthalene   | 170                                                  | 370                                                     |
| <b>OCP</b>    |                                                      |                                                         |
| DDT           | 180                                                  | 640                                                     |

**Table 7: Ecological Screening Levels (Tier 1) from NEPM**

| Contaminant          | Soil Type     | Public Open Space ESL for Passive Open Space (mg/kg) | Commercial and Industrial ESL for Rail Corridor (mg/kg) |
|----------------------|---------------|------------------------------------------------------|---------------------------------------------------------|
| Benzene              | Fine          | 65                                                   | 95                                                      |
| Toluene              | Fine          | 105                                                  | 135                                                     |
| Ethylbenzene         | Fine          | 105                                                  | 135                                                     |
| Xylenes              | Fine          | 45                                                   | 95                                                      |
| TPH C6-C10 less BTEX | Coarse/ Fine  | 180*                                                 | 215*                                                    |
| TPH >C10-C16         | Coarse/ Fine  | 120*                                                 | 170*                                                    |
| TPH >C16-C34         | Fine          | 1300                                                 | 2500                                                    |
| TPH >C34-C40         | Fine          | 5600                                                 | 6600                                                    |
| Benzo(a)pyrene       | Coarse / Fine | 0.7                                                  | 1.4                                                     |

Notes: ESL are of low reliability except where indicated by \* which indicates that the ESL is of moderate reliability  
 TPH is total petroleum hydrocarbons

## 4.0 Management Limits

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

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

Management limits are shown in Table 8. Clay was encountered during the investigation and, so, management limits for fine soils have been adopted.

**Table 8: Management Limits for TPH from NEPM (mg/kg)**

| Contaminant  | Soil Type | Public Open Space<br>Management Limits for<br>Passive Open Space<br>(mg/kg) | Commercial and<br>Industrial Management<br>Limit for Rail Corridor<br>(mg/kg) |
|--------------|-----------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| TPH C6-C10   | Fine      | 800                                                                         | 800                                                                           |
| TRH >C10-C16 | Fine      | 1000                                                                        | 1000                                                                          |
| TPH >C16-C34 | Fine      | 3500                                                                        | 5000                                                                          |
| TPH >C34-C40 | Fine      | 10 000                                                                      | 10 000                                                                        |

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## **Appendix F**

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### Site Assessment Criteria – Water

## Site Assessment Criteria for Groundwater for AEC31a

### Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)

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#### 1.0 Introduction

The following references were consulted for deriving 'Tier 1' SAC for groundwater:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).
- NHMRC *Guidelines for Managing Risks In Recreational Water* (NHMRC, 2008).
- ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

#### 2.0 Ecological Criteria

SAC for the protection of aquatic freshwater ecosystems which may receive groundwater from the site include:

- Default guideline values (DGV) recommended for the protection of slightly to moderately disturbed freshwater ecosystems (or otherwise for an unknown level of protection) from ANZG (2018) (Table 1).
- Freshwater water quality guidelines from NEMP (Table 2).

It is noted that livestock at surrounding farmland could potentially be a receptor to discharged groundwater (as surface water) that was sourced from the site, however, water quality guidelines for livestock in ANZECC (2000) are generally less conservative than the DGV (Table 1) and have not been listed herein.

**Table 1: Default Guideline Values for Protection of Aquatic Ecosystems from ANZG (2018)**

| Contaminant    | Fresh Water DGV<br>(µg/L) |
|----------------|---------------------------|
| <b>Metals</b>  |                           |
| Arsenic (III)  | 24                        |
| Arsenic (V)    | 13                        |
| Cadmium        | 0.3-22.3*                 |
| Chromium (III) | 3.3                       |
| Chromium (VI)  | 1.0                       |

| Contaminant                                   | Fresh Water DGV<br>(µg/L) |
|-----------------------------------------------|---------------------------|
| Copper                                        | 1.4                       |
| Lead                                          | 6.5-2843*                 |
| Mercury (inorganic)                           | 0.06                      |
| Nickel                                        | 17-994*                   |
| Zinc                                          | 12-723*                   |
| <b>Aromatic Hydrocarbons (including BTEX)</b> |                           |
| Benzene                                       | 950                       |
| Ethylbenzene                                  | 80                        |
| Toluene                                       | 180                       |
| m-Xylene                                      | 75                        |
| o-Xylene                                      | 350                       |
| p-Xylene                                      | 200                       |
| Isopropylbenzene                              | 30                        |
| <b>PAH</b>                                    |                           |
| Anthracene                                    | 0.01                      |
| Benzo(a)pyrene                                | 0.1                       |
| Fluoranthene                                  | 1                         |
| Naphthalene                                   | 16                        |
| Phenanthrene                                  | 0.6                       |
| <b>Phenols</b>                                |                           |
| 2,4-dinitrophenol                             | 45                        |
| 2,4-dimethylphenol                            | 2                         |
| 4-nitrophenol                                 | 58                        |
| Phenol                                        | 320                       |
| 2,3,4,6-tetrachlorophenol                     | 10                        |
| 2,3,5,6-tetrachlorophenol                     | 0.2                       |
| 2,4,6-trichlorophenol                         | 3                         |
| 2,4-dichlorophenol                            | 120                       |
| 2,6-dichlorophenol                            | 34                        |
| 2-chlorophenol                                | 340                       |
| Pentachlorophenol                             | 3.6                       |
| <b>OCP</b>                                    |                           |
| Aldrin                                        | 0.001                     |
| Chlordane                                     | 0.03                      |
| DDT                                           | 0.006                     |
| Dieldrin                                      | 0.01                      |
| Endosulfan                                    | 0.03                      |
| Endrin                                        | 0.01                      |

| Contaminant                         | Fresh Water DGV<br>(µg/L) |
|-------------------------------------|---------------------------|
| Heptachlor                          | 0.01                      |
| Methoxychlor                        | 0.005                     |
| <b>OPP</b>                          |                           |
| Azinphos methyl                     | 0.01                      |
| Chlorpyrifos                        | 0.01                      |
| Diazinon                            | 0.01                      |
| Dimethoate                          | 0.15                      |
| Fenitrothion                        | 0.2                       |
| Malathion                           | 0.05                      |
| Parathion                           | 0.004                     |
| <b>PCB</b>                          |                           |
| Aroclor 1242                        | 0.3                       |
| Aroclor 1254                        | 0.01                      |
| <b>Ammonia</b>                      |                           |
| Ammonia (as total ammonia nitrogen) | 900                       |
| <b>Other Organics</b>               |                           |
| 1,1,2-trichloroethane               | 6500                      |
| 1,1-dichloroethene                  | 700                       |
| 1,2-dichloroethane                  | 1900                      |
| 1,2-dichloropropane                 | 900                       |
| 1,3-dichloropropane                 | 1100                      |
| Carbon tetrachloride                | 240                       |
| Chloroform                          | 370                       |
| Tetrachloroethene                   | 70                        |
| Vinyl chloride                      | 100                       |
| 1,2,3-trichlorobenzene              | 3                         |
| 1,2,4-trichlorobenzene              | 85                        |
| 1,2-dichlorobenzene                 | 160                       |
| 1,3-dichlorobenzene                 | 260                       |
| 1,4-dichlorobenzene                 | 60                        |
| Chlorobenzene                       | 55                        |
| 1,1,1-Trichloroethane               | 270                       |
| Trichloroethene                     | 330                       |
| 1,1,2,2-Tetrachloroethane           | 400                       |

Notes: \* Modified for hardness

### 3.0 Human Health and Aesthetic Criteria

Human health-based SAC include:

- Health Screening Levels (HSL) for vapour intrusion for selected petroleum hydrocarbons and fractions (Tables 2 and 3). These are applicable for assessing human health via the inhalation pathway. HSL are shown for clay, given that clay is the predominant soil type. HSL D are applicable for areas to be covered by buildings (e.g., stations, offices and enclosed sheds). Where groundwater levels are less than 2 m from the (proposed / final) ground surface, the laboratory practical quantitation limits will be adopted for initial screening purposes; and
- Health-based guidelines for recreational waters (Table 4). These are health-based criteria from NHMRC, NRMCC (2022) multiplied by 10 (to account for lower human consumption of recreational waters compared to drinking water).

Given that groundwater in the area is not used for drinking or domestic purposes (according to groundwater bore registered with Water NSW), health-based drinking water guidelines have not been adopted as SAC.

For the consideration of aesthetics of recreational waters, aesthetic guideline values from NHMRC, NRMCC (2022) have been included in Table 4.

**Table 2: Groundwater Health Screening Levels for Vapour Intrusion from NEPM for Passive Open Space**

| Contaminant                    | HSL C<br>(µg/L) | HSL C<br>(µg/L) | HSL C<br>(µg/L) |
|--------------------------------|-----------------|-----------------|-----------------|
| CLAY                           | 2 m to <4 m     | 4 m to <8 m     | 8 m+            |
| Benzene                        | NL              | NL              | NL              |
| Toluene                        | NL              | NL              | NL              |
| Ethylbenzene                   | NL              | NL              | NL              |
| Xylenes                        | NL              | NL              | NL              |
| Naphthalene                    | NL              | NL              | NL              |
| TPH C6-C10 minus BTEX          | NL              | NL              | NL              |
| TPH >C10-C16 minus naphthalene | NL              | NL              | NL              |

Notes: The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

**Table 3: Groundwater Health Screening Levels for Vapour Intrusion from NEPM for Rail Corridor**

| Contaminant                    | HSL D<br>(µg/L) | HSL D<br>(µg/L) | HSL D<br>(µg/L) |
|--------------------------------|-----------------|-----------------|-----------------|
| CLAY                           | 2 m to <4 m     | 4 m to <8 m     | 8 m+            |
| Benzene                        | 30 000          | 30 000          | 35 000          |
| Toluene                        | NL              | NL              | NL              |
| Ethylbenzene                   | NL              | NL              | NL              |
| Xylenes                        | NL              | NL              | NL              |
| Naphthalene                    | NL              | NL              | NL              |
| TPH C6-C10 minus BTEX          | NL              | NL              | NL              |
| TPH >C10-C16 minus naphthalene | NL              | NL              | NL              |

Notes: The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

California Regional Water Quality Board (CRWB, 2016) aquatic habitat screening levels have been adopted for TRH.

**Table 3.1: CRWB Screening Levels**

| Contaminant     | CRWB (2016)<br>(µg/L) |
|-----------------|-----------------------|
| F1 TPH C6-C10   | 440                   |
| F2 TPH >C10-C16 |                       |
| F3 >C16-C34     | 640                   |
| F4 >C34-C40     |                       |

**Table 4: Guidelines for Protection of Recreational Waters from NHMRC (2008) and NHMRC, NRMCC (2022)**

| Contaminant   | Health-based Guideline Value<br>(µg/L) | Aesthetic Guideline Value<br>(µg/L) |
|---------------|----------------------------------------|-------------------------------------|
| <b>Metals</b> |                                        |                                     |
| Arsenic       | 100                                    | -                                   |
| Cadmium       | 20                                     | -                                   |
| Chromium (VI) | 500                                    | -                                   |
| Copper        | 20 000                                 | 1000                                |
| Lead          | 100                                    | -                                   |
| Mercury       | 10                                     | -                                   |
| Nickel        | 200                                    | -                                   |

| Contaminant                | Health-based Guideline Value (µg/L) | Aesthetic Guideline Value (µg/L) |
|----------------------------|-------------------------------------|----------------------------------|
| Zinc                       | -                                   | 3000                             |
| <b>BTEX</b>                |                                     |                                  |
| Benzene                    | 10                                  | -                                |
| Toluene                    | 8000                                | 25                               |
| Ethylbenzene               | 3000                                | 3                                |
| Xylene (total)             | 6000                                | 20                               |
| <b>PAH</b>                 |                                     |                                  |
| Benzo(a)pyrene             | 0.1                                 | -                                |
| <b>OCP</b>                 |                                     |                                  |
| Aldrin + Dieldrin          | 3                                   | -                                |
| Chlordane                  | 20                                  | -                                |
| DDT                        | 90                                  | -                                |
| Endosulfan                 | 200                                 | -                                |
| Heptachlor                 | 3                                   | -                                |
| Methoxychlor               | 3000                                | -                                |
| <b>OPP</b>                 |                                     |                                  |
| Azinphos methyl            | 300                                 | -                                |
| Diazinon                   | 40                                  | -                                |
| Dimethoate                 | 70                                  | -                                |
| Ethion                     | 40                                  | -                                |
| Fenitrothion               | 70                                  | -                                |
| Malathion                  | 700                                 | -                                |
| Methyl parathion           | 7                                   | -                                |
| Parathion                  | 200                                 | -                                |
| <b>Halogenated Phenols</b> |                                     |                                  |
| 2,4,6-trichlorophenol      | 200                                 | 2                                |
| 2,4-dichlorophenol         | 2000                                | 0.3                              |
| 2-chlorophenol             | 3000                                | 0.1                              |
| Pentachlorophenol          | 100                                 | -                                |
| <b>Other Organics</b>      |                                     |                                  |
| 1,1-dichloroethene         | 300                                 | -                                |
| 1,2-dichloroethane         | 30                                  | -                                |
| Carbon tetrachloride       | 30                                  | -                                |
| Hexachlorobutadiene        | 7                                   | -                                |
| Tetrachloroethene          | 500                                 | -                                |

| Contaminant                   | Health-based Guideline Value<br>(µg/L) | Aesthetic Guideline Value<br>(µg/L) |
|-------------------------------|----------------------------------------|-------------------------------------|
| Vinyl chloride                | 3                                      | -                                   |
| 1,2-dichlorobenzene           | 15 000                                 | 1                                   |
| 1,3-dichlorobenzene           | -                                      | 20                                  |
| 1,4-dichlorobenzene           | 400                                    | 0.3                                 |
| Chlorobenzene                 | 3000                                   | 10                                  |
| Styrene                       | 300                                    | 4                                   |
| <b>Other Inorganics</b>       |                                        |                                     |
| Ammonia (as NH <sub>3</sub> ) | -                                      | 500                                 |

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**Douglas Partners Pty Ltd**

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## Appendix G

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Test Pit and Bore Hole Logs



# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP02

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291859.9, N: 6258067.9 (56 MGA2020)

SURFACE ELEVATION : 36.40 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                                                    | MATERIAL  |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|-------------------|---------|------------------------|----------------------------------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|-------------------------------|--------------------------------------------------------------------------------------------------------------|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS                           | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components                                                                    | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER     | STRUCTURE<br>& Other Observations                                                                            |
| VE<br>E<br>F<br>H |         | Not Observed           | ES<br>0.00m<br>ES<br>0.20m<br>0.50m<br>ES<br>0.60m | 0.0       |                                                                                     | CI-CH                    | 0.05m<br>FILL: silty SAND: brown, fine to medium grained sand, trace rootlets, trace glass<br>Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | D<br>w<PL             | VSt                                | 100<br>200<br>300<br>400<br>X | FILL<br>0.00: PID<5<br>RESIDUAL SOIL<br>0.10: HP =260 kPa<br>0.10: PID<5<br>0.50: HP =210 kPa<br>0.50: PID<5 |
|                   |         |                        |                                                    | 0.5       |                                                                                     |                          | 0.60m<br>EXCAVATION AEC31ATP02 TERMINATED AT 0.60 m<br>Target depth                                                                                                                   |                       |                                    | X                             |                                                                                                              |
|                   |         |                        |                                                    | 1.0       |  |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 1.5       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 2.0       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 2.5       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 3.0       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 3.5       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 4.0       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 4.5       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 5.0       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |
|                   |         |                        |                                                    | 5.5       |                                                                                     |                          |                                                                                                                                                                                       |                       |                                    |                               |                                                                                                              |

PHOTOGRAPHS NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE W U H VH

No Resistance

**WATER**

10 Oct., 73 Water Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS & SOIL DESCRIPTION**  
Based on Unified Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/ RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP03

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291885.4, N: 6258070.1 (56 MGA2020)

SURFACE ELEVATION : 35.50 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                                                        | MATERIAL  |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|-------------------|---------|------------------------|--------------------------------------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS                               | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components                                                                                      | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                                                                                                          |
| VE<br>F<br>H      |         | Not Observed           | ES<br>0.09m<br>ES<br>0.20m<br><br>0.60m<br>ES<br>0.70m | 0.0       |                                                                                     | CI-CH                    | FILL: silty CLAY: low to medium plasticity, red-brown, trace rootlets, trace fine to medium ironstone gravel<br>Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | w<PL                  | St to VSt                          | X                         | FILL<br>0.00: reworked natural<br>0.00: PID<5<br>RESIDUAL SOIL<br>0.10: HP =210 kPa<br>0.10: PID<5<br><br>0.60: HP =180 kPa<br>0.60: PID<5 |
|                   |         |                        |                                                        | 0.5       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    | X                         |                                                                                                                                            |
|                   |         |                        |                                                        | 0.80m     |                                                                                     |                          | EXCAVATION AEC31ATP03 TERMINATED AT 0.80 m<br>Target depth                                                                                                                                              |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 1.0       |  |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 1.5       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 2.0       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 2.5       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 3.0       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 3.5       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 4.0       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 4.5       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        | 5.0       |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |
|                   |         |                        |                                                        |           |                                                                                     |                          |                                                                                                                                                                                                         |                       |                                    |                           |                                                                                                                                            |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE W U H VH

No Resistance

**WATER**

10 Oct., 73 Water Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP04

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291842.0, N: 6258100.1 (56 MGA2020)

SURFACE ELEVATION : 37.20 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING                                     |  |              |                                                                     |                          | MATERIAL    |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|----------------------------------------------|--|--------------|---------------------------------------------------------------------|--------------------------|-------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------------------------|--------------------------------------------------------------|-----------------------------------|--|--|
| VE<br>E<br>PENETRATION<br>F<br>H             |  | SUPPORT      | GROUND WATER<br>LEVELS                                              | SAMPLES &<br>FIELD TESTS | DEPTH (m)   | GRAPHIC<br>LOG                                                                          | CLASSIFICATION<br>SYMBOL                                                                           | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY                | HAND<br>PENETRO-<br>METER<br>kPa<br>100<br>200<br>300<br>400 | STRUCTURE<br>& Other Observations |  |  |
| <div><div></div><div></div><div></div></div> |  | Not Observed | ES<br>0.10m<br><br>0.40m<br>ES<br>0.50m<br><br>0.90m<br>ES<br>1.00m | 0.0                      | <div></div> |                                                                                         | FILL: silty SAND: brown, fine to medium grained sand, with red-brown silty CLAY (reworked natural) | M                                                                                                                  |                       |                                                   |                                                              | FILL<br>0.00: PID<5               |  |  |
|                                              |  |              |                                                                     | 0.30m                    |             | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | w<PL                                                                                               | St to VSt                                                                                                          | X                     | RESIDUAL SOIL<br>0.40: HP =240 kPa<br>0.40: PID<5 |                                                              |                                   |  |  |
|                                              |  |              |                                                                     | 0.5                      | <div></div> | CI-CH                                                                                   |                                                                                                    |                                                                                                                    | X                     | 0.90: HP =180 kPa<br>0.90: PID<5                  |                                                              |                                   |  |  |
|                                              |  |              |                                                                     | 1.0                      |             | EXCAVATION AEC31ATP04 TERMINATED AT 1.00 m<br>Target depth                              |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 1.5         |                                                                                         |                 |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 2.0         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 2.5         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 3.0         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 3.5         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 4.0         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 4.5         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |
|                                              |  |              |                                                                     |                          | 5.0         |                                                                                         |                                                                                                    |                                                                                                                    |                       |                                                   |                                                              |                                   |  |  |



PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP05

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291881.5, N: 6258087.3 (56 MGA2020)

SURFACE ELEVATION : 35.80 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING |   |   |   | MATERIAL |                     |                       |              |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|----------|---|---|---|----------|---------------------|-----------------------|--------------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------|
| VE       | E | F | H | SUPPORT  | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m)    | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY RELATIVE DENSITY | HAND PENETROMETER | STRUCTURE & Other Observations                                                                            |
|          |   |   |   |          |                     | ES 0.10m              | 0.0          |             |                       | FILL: silty SAND: fine to medium grained sand, trace rootlets                                                      | M                  |                              |                   | FILL<br>0.00: PID<5                                                                                       |
|          |   |   |   |          |                     | 0.40m<br>ES<br>0.50m  | 0.30m<br>0.5 |             |                       | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel, trace decomposed wood     |                    |                              | X                 | Field Replicate<br>BD1/20221209 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.40: HP =200 kPa<br>0.40: PID<5 |
|          |   |   |   |          |                     | 0.90m<br>ES<br>1.00m  | 0.9<br>1.0   |             | CI-CH                 | At 0.7m: orange-brown mottled pale grey                                                                            | w-PL               | St to VSt                    | X                 | 0.90: HP =240 kPa<br>0.90: PID<5                                                                          |
|          |   |   |   |          |                     |                       | 1.10m        |             |                       | EXCAVATION AEC31ATP05 TERMINATED AT 1.10 m<br>Target depth                                                         |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 1.5          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 2.0          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 2.5          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 3.0          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 3.5          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 4.0          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 4.5          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |
|          |   |   |   |          |                     |                       | 5.0          |             |                       |                                                                                                                    |                    |                              |                   |                                                                                                           |

PHOTOGRAPHS NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS & SOIL DESCRIPTION**  
Based on Unified Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/ RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP06

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291932.7, N: 6258117.2 (56 MGA2020)

SURFACE ELEVATION : 35.30 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|-------------------|--|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|--|---|---------------------------------------------------|-----------------------------------|--|--|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |                                                                                         | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER |  |   |                                                   | STRUCTURE<br>& Other Observations |  |  |  |  |
|                   |  |         | Not Observed           | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: fine to medium grained sand, trace rootlets, trace decomposed wood                               |                                                                                         | M                     |                                    |                           |  |   | FILL<br>0.00: PID<5                               |                                   |  |  |  |  |
|                   |  |         |                        | 0.30m<br>ES<br>0.40m     |           |                                                                                     |                          | 0.20m                                                                                                              | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel |                       |                                    |                           |  | ✗ | RESIDUAL SOIL<br>0.30: HP =200 kPa<br>0.30: PID<5 |                                   |  |  |  |  |
|                   |  |         |                        | 0.80m<br>ES<br>0.90m     | 0.5       |                                                                                     | CI-CH                    |                                                                                                                    | At 0.7m: orange-brown mottled pale grey                                                 |                       | w-PL                               | St to<br>VSt              |  | ✗ |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          |           |                                                                                     |                          | 0.90m                                                                                                              | EXCAVATION AEC31ATP06 TERMINATED AT 0.90 m<br>Target depth                              |                       |                                    |                           |  |   | 0.80: HP =200 kPa<br>0.80: PID<5                  |                                   |  |  |  |  |
|                   |  |         |                        |                          | 1.0       |  |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 1.5       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |
|                   |  |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                                                                                         |                       |                                    |                           |  |   |                                                   |                                   |  |  |  |  |



PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP07

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291879.1, N: 6258114.1 (56 MGA2020)

SURFACE ELEVATION : 36.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |                      |                        |                          |           | MATERIAL       |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|-------------------|--|----------------------|------------------------|--------------------------|-----------|----------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------------------------------|-----------------------------------|--|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT              | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL                                                                | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER                         | STRUCTURE<br>& Other Observations |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
| Not Observed      |  | ES<br>0.10m          | 0.0                    | 0.50m<br>ES<br>0.60m     | 0.5       | 0.90m          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | w-PL                                                                                                               | St to VSt             | X                                  | RESIDUAL SOIL<br>1.00: HP =210 kPa<br>1.00: PID<5 |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
| ES<br>1.10m       |  | 1.00m<br>ES<br>1.10m | 1.0                    | 1.40m<br>ES<br>1.50m     | 1.5       | 1.50m          | EXCAVATION AEC31ATP07 TERMINATED AT 1.50 m<br>Target depth                              |                                                                                                                    |                       | X                                  | 1.40: HP =170 kPa<br>1.40: PID<5                  |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
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|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |
|                   |  |                      |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |  |  |  |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP08

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291855.5, N: 6258124.8 (56 MGA2020)

SURFACE ELEVATION : 36.80 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------|---------------------------------------------------|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |
|                   |         |                        | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets, irrigation hose                         | M                                                           |                           | FILL<br>0.00: PID<5                               |
|                   |         |                        | 0.30m<br>ES<br>0.40m     | 0.20m     |                                                                                     |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                                                        | VSt                       | RESIDUAL SOIL<br>0.30: HP =280 kPa<br>0.30: PID<5 |
|                   |         |                        | 0.70m<br>ES<br>0.80m     | 0.5       |                                                                                     | CI-CH                    |                                                                                                                    |                                                             |                           | 0.70: HP =240 kPa<br>0.70: PID<5                  |
|                   |         |                        |                          | 0.80m     |                                                                                     |                          | EXCAVATION AEC31ATP08 TERMINATED AT 0.80 m<br>Target depth                                                         |                                                             |                           |                                                   |
|                   |         |                        |                          | 1.0       |  |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 1.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP09

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291879.5, N: 6258129.7 (56 MGA2020)

SURFACE ELEVATION : 35.70 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING                                                   |  |  |  | MATERIAL                                                                                                           |  |  |  |  |  |  |  |  |  |  |
|------------------------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|--|
| SUPPORT                                                    |  |  |  | STRUCTURE & Other Observations                                                                                     |  |  |  |  |  |  |  |  |  |  |
| GROUND WATER LEVELS                                        |  |  |  | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |  |  |  |  |  |  |  |  |  |  |
| SAMPLES & FIELD TESTS                                      |  |  |  | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY                                                        |  |  |  |  |  |  |  |  |  |  |
| DEPTH (m)                                                  |  |  |  | HAND<br>PENETRO-<br>METER                                                                                          |  |  |  |  |  |  |  |  |  |  |
| GRAPHIC LOG                                                |  |  |  | CLASSIFICATION SYMBOL                                                                                              |  |  |  |  |  |  |  |  |  |  |
| Not Observed                                               |  |  |  | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets                                          |  |  |  |  |  |  |  |  |  |  |
| ES 0.10m                                                   |  |  |  | D                                                                                                                  |  |  |  |  |  |  |  |  |  |  |
| 0.30m                                                      |  |  |  | 0.25m                                                                                                              |  |  |  |  |  |  |  |  |  |  |
| ES 0.40m                                                   |  |  |  | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |  |  |  |  |  |  |  |  |  |  |
| 0.80m                                                      |  |  |  | w<PL St to VSt                                                                                                     |  |  |  |  |  |  |  |  |  |  |
| ES 0.90m                                                   |  |  |  | 0.90m                                                                                                              |  |  |  |  |  |  |  |  |  |  |
| EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth |  |  |  | 0.80: HP =260 kPa<br>0.80: PID<5                                                                                   |  |  |  |  |  |  |  |  |  |  |
| 1.0                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 1.5                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 2.0                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 2.5                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 3.0                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 3.5                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 4.0                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 4.5                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |
| 5.0                                                        |  |  |  | EXCAVATION AEC31ATP09 TERMINATED AT 0.90 m<br>Target depth                                                         |  |  |  |  |  |  |  |  |  |  |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP10

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291853.2, N: 6258159.3 (56 MGA2020)

SURFACE ELEVATION : 37.20 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          |           | MATERIAL       |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
|-------------------|--|---------|------------------------|--------------------------|-----------|----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|--|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |  |  |  |
|                   |  |         | Not Observed           | ES<br>0.10m              | 0.0       |                |                          | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets, concrete                                | M                     |                                    |                           | FILL<br>0.00: PID<5                               |  |  |  |
|                   |  |         |                        | 0.30m<br>ES<br>0.40m     |           |                | 0.20m                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |                       |                                    | X                         | RESIDUAL SOIL<br>0.30: HP =210 kPa<br>0.30: PID<5 |  |  |  |
|                   |  |         |                        | 0.80m<br>ES<br>0.90m     | 0.5       |                | CI-CH                    |                                                                                                                    | w<PL                  | St to<br>VSt                       | X                         | 0.80: HP =180 kPa<br>0.80: PID<5                  |  |  |  |
|                   |  |         |                        |                          | 1.0       |                |                          | 1.00m                                                                                                              |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          | EXCAVATION AEC31ATP10 TERMINATED AT 1.00 m<br>Target depth                                                         |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          |                                 |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
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|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |
|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |

PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP11

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291878.9, N: 6258173.7 (56 MGA2020)

SURFACE ELEVATION : 36.80 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

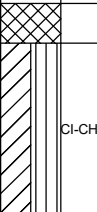
METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |  |              |                        |                                                                                   | MATERIAL  |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|-------------------|--|--|--------------|------------------------|-----------------------------------------------------------------------------------|-----------|----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------|--|--|
| VE<br>E<br>F<br>H |  |  | SUPPORT      | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS                                                          | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                                                                                    |  |  |
|                   |  |  | Not Observed | ES<br>0.10m            |  | 0.0       | CI-CH          | 0.15m                    | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets                                          | M                     |                                    |                           | FILL<br>0.00: PID<5<br><br>RESIDUAL SOIL<br>0.20: HP =190 kPa<br>0.20: PID<5<br><br>0.70: HP =200 kPa<br>0.70: PID<5 |  |  |
|                   |  |  |              | ES<br>0.20m            |                                                                                   |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              | ES<br>0.30m            |                                                                                   |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              | ES<br>0.70m            |                                                                                   |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              | ES<br>0.80m            |                                                                                   |           |                | 0.80m                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w-PL                  | St to VSt                          |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   |           |                |                          | EXCAVATION AEC31ATP11 TERMINATED AT 0.80 m<br>Target depth                                                         |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 1.0       |                |                          |                                 |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 1.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 2.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 2.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 3.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 3.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 4.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 4.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   | 5.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |
|                   |  |  |              |                        |                                                                                   |           |                |                          |                                                                                                                    |                       |                                    |                           |                                                                                                                      |  |  |

PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP12

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291902.3, N: 6258160.2 (56 MGA2020)

SURFACE ELEVATION : 36.10 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |  |              |                        |                          | MATERIAL  |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|-------------------|--|--|--------------|------------------------|--------------------------|-----------|----------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|----------------------------------|---------------------------------------------------|--|--|
| VE<br>E<br>F<br>H |  |  | SUPPORT      | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL                                                                | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER        | STRUCTURE<br>& Other Observations                 |  |  |
|                   |  |  |              |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  | Not Observed | ES<br>0.10m            | 0.0                      |           |                | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                    | M                                                                                                                  |                       |                                    |                                  | FILL<br>0.00: PID<5                               |  |  |
|                   |  |  |              | 0.30m<br>ES<br>0.40m   |                          | 0.20m     |                | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel |                                                                                                                    |                       |                                    |                                  | RESIDUAL SOIL<br>0.30: HP =180 kPa<br>0.30: PID<5 |  |  |
|                   |  |  |              | 0.80m<br>ES<br>0.90m   | 0.5                      | CI-CH     |                | w<PL                                                                                    | St                                                                                                                 |                       |                                    | 0.80: HP =160 kPa<br>0.80: PID<5 |                                                   |  |  |
|                   |  |  |              |                        |                          |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 1.0                      |           |                | EXCAVATION AEC31ATP12 TERMINATED AT 0.90 m<br>Target depth                              |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 1.5                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 2.0                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 2.5                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 3.0                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 3.5                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 4.0                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 4.5                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |
|                   |  |  |              |                        | 5.0                      |           |                |                                                                                         |                                                                                                                    |                       |                                    |                                  |                                                   |  |  |



PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP13

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291863.8, N: 6258195.6 (56 MGA2020)

SURFACE ELEVATION : 37.50 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING                                                                                                                                                |   |   |   | MATERIAL                                                                                                                                                                                                                                                                                                  |                     |                       |           |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| VE                                                                                                                                                      | E | F | H | SUPPORT                                                                                                                                                                                                                                                                                                   | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG                                                                                                                                                                                                                                                                               | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY RELATIVE DENSITY                                                                                                                             | HAND PENETROMETER | STRUCTURE & Other Observations                       |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     | ES 0.10m              | 0.0       |                                                                                                                                                                                                                                                                                           |                       | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets                                          | M                  |                                                                                                                                                          |                   | FILL<br>0.00: PID<5                                  |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     | ES 0.30m              | 0.20m     |                                                                                                                                                                                                                                                                                           |                       | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |                    |                                                                                                                                                          |                   | Field Replicate<br>BD3/20221208 taken at<br>0.0-0.1m |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     | ES 0.40m              | 0.5       |                                                                                                                                                                                                                                                                                           | CI-CH                 |                                                                                                                    | w<PL               | St to VSt                                                                                                                                                |                   | RESIDUAL SOIL<br>0.30: HP =240 kPa<br>0.30: PID<5    |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     | ES 0.80m              | 1.0       |                                                                                                                                                                                                                                                                                           |                       | EXCAVATION AEC31ATP13 TERMINATED AT 1.00 m<br>Target depth                                                         |                    |                                                                                                                                                          |                   | 0.80: HP =190 kPa<br>0.80: PID<5                     |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     | ES 0.90m              | 1.5       |                                                                                                                                                                                                        |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 2.0       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 2.5       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 3.0       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 3.5       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 4.0       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 4.5       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       | 5.0       |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       |           |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
|                                                                                                                                                         |   |   |   |                                                                                                                                                                                                                                                                                                           |                     |                       |           |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
| PHOTOGRAPHS NOTES                                                                                                                                       |   |   |   | <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO                                                                                                                                                                                                                                       |                     |                       |           |                                                                                                                                                                                                                                                                                           |                       |                                                                                                                    |                    |                                                                                                                                                          |                   |                                                      |  |                                                                                                                                                                                                                   |  |  |  |
| <b>METHOD</b><br>N Natural Exposure<br>E Existing Excavation<br>BH Backhoe Bucket<br>B Bulldozer Blade<br>R Ripper<br><br><b>SUPPORT</b><br>T Timbering |   |   |   | <b>PENETRATION</b><br> No Resistance<br><br><b>WATER</b><br> 10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow |                     |                       |           | <b>SAMPLES &amp; FIELD TESTS</b><br>U50 - Undisturbed Sample<br>50 mm diameter<br>D - Disturbed Sample<br>B - Bulk Disturbed Sample<br>MC - Moisture Content<br>HP - Hand Penetrometer (UCS kPa)<br>VS - Vane Shear; P-Peak,<br>R-Remoulded (uncorrected kPa)<br>PBT - Plate Bearing Test |                       |                                                                                                                    |                    | <b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b><br>Based on Unified Classification System<br><br><b>MOISTURE</b><br>D - Dry<br>M - Moist<br>W - Wet |                   |                                                      |  | <b>CONSISTENCY/ RELATIVE DENSITY</b><br>VS - Very Soft<br>S - Soft<br>F - Firm<br>St - Stiff<br>VSt - Very Stiff<br>H - Hard<br>VL - Very Loose<br>L - Loose<br>MD - Medium Dense<br>D - Dense<br>VD - Very Dense |  |  |  |

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP14

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291903.2, N: 6258193.3 (56 MGA2020)

SURFACE ELEVATION : 37.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|--|--|--|--|--|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |  |  |  |  |  |
|                   |         |                        | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: brown, fine to medium grained sand, trace fine gravel,<br>trace rootlets                         | M                     |                                    |                           | FILL<br>0.00: PID<5                               |  |  |  |  |  |
|                   |         |                        | ES<br>0.20m              |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        | ES<br>0.30m              |           |                                                                                     |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium<br>ironstone gravel                         |                       |                                    | X                         | RESIDUAL SOIL<br>0.20: HP =170 kPa<br>0.20: PID<5 |  |  |  |  |  |
|                   |         |                        |                          | 0.5       |                                                                                     | CI-CH                    |                                                                                                                    | w-PL                  | St to<br>Vst                       | X                         | 0.70: HP =200 kPa<br>0.70: PID<5                  |  |  |  |  |  |
|                   |         |                        | 0.70m                    |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        | ES<br>0.80m              | 1.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 1.20m     |                                                                                     |                          | EXCAVATION AEC31ATP14 TERMINATED AT 1.20 m<br>Target depth                                                         |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 1.5       |  |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water  
Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter

D - Disturbed Sample

B - Bulk Disturbed Sample

MC - Moisture Content

HP - Hand Penetrometer (UCS kPa)

VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)

PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP15

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291877.5, N: 6258208.8 (56 MGA2020)

SURFACE ELEVATION : 37.30 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |              |                        |                          |           | MATERIAL                                                                            |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|-------------------|--|--------------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|----------------------------------|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT      | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |                                  |  |  |
|                   |  |              |                        |                          |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
| [Pattern]         |  | Not Observed |                        | ES<br>0.10m              | 0.0       | [Pattern]                                                                           |                          | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                                               | M                     |                                    |                           | FILL<br>0.00: PID<5                               |                                  |  |  |
|                   |  |              |                        | ES<br>0.20m              |           |                                                                                     |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                  | St to VSt                          | X                         | RESIDUAL SOIL<br>0.20: HP =190 kPa<br>0.20: PID<5 |                                  |  |  |
|                   |  |              |                        | ES<br>0.30m              |           |                                                                                     | CI-CH                    |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        | ES<br>0.60m              |           | 0.5                                                                                 |                          |                                                                                                                    |                       |                                    |                           | X                                                 | 0.60: HP =210 kPa<br>0.60: PID<5 |  |  |
|                   |  |              |                        | ES<br>0.70m              |           | 0.70m                                                                               |                          | EXCAVATION AEC31ATP15 TERMINATED AT 0.70 m<br>Target depth                                                         |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 1.0       |  |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 1.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |
|                   |  |              |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |                                  |  |  |



PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP16

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291906.7, N: 6258225.3 (56 MGA2020)

SURFACE ELEVATION : 36.80 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                                                                         |
| VE<br>F<br>H      |         | Not Observed           | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                                               | M                                                           |                           | FILL<br>0.00: PID<5                                                                                       |
|                   |         |                        | 0.30m<br>ES              | 0.20m     |                                                                                     |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                                                        | St to VSt                 | Field Replicate<br>BD5/20221208 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.30: HP =210 kPa<br>0.30: PID<5 |
|                   |         |                        | 0.40m<br>ES              | 0.5       |                                                                                     | CI-CH                    |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        | 0.70m<br>ES              |           |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        | 0.80m<br>ES              | 0.80m     |                                                                                     |                          | EXCAVATION AEC31ATP16 TERMINATED AT 0.80 m<br>Target depth                                                         |                                                             |                           | 0.70: HP =210 kPa<br>0.70: PID<5                                                                          |
|                   |         |                        |                          | 1.0       |  |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 1.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                                                                           |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE W U H VH

No Resistance

**WATER**

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP17

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291860.6, N: 6258226.0 (56 MGA2020)

SURFACE ELEVATION : 37.50 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING                         |  |  |              |                        |                          | MATERIAL    |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|----------------------------------|--|--|--------------|------------------------|--------------------------|-------------|----------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------|-----------------------|------------------------------------|---------------------------------------------------|------------------------------------------------------|
| VE<br>E<br>PENETRATION<br>F<br>H |  |  | SUPPORT      | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)   | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL                                                                | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |              | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER                         | STRUCTURE<br>& Other Observations                    |
| <div></div>                      |  |  | Not Observed | ES<br>0.10m            | 0.0                      | <div></div> |                | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets and wood      | M                                                                                                                  |              |                       |                                    |                                                   | FILL<br>0.00: PID<5                                  |
|                                  |  |  |              | 0.30m                  |                          |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   | Field Replicate<br>BD2/20221208 taken at<br>0.0-0.1m |
|                                  |  |  |              | ES<br>0.40m            | 0.5                      | <div></div> | CI-CH          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | w-PL                                                                                                               | St to<br>Vst |                       |                                    | RESIDUAL SOIL<br>0.30: HP =200 kPa<br>0.30: PID<5 |                                                      |
|                                  |  |  |              | 0.80m                  |                          |             |                |                                                                                         |                                                                                                                    |              |                       |                                    | 0.80: HP =210 kPa<br>0.80: PID<5                  |                                                      |
| <div></div>                      |  |  |              | ES<br>0.90m            | 1.0                      | <div></div> |                | EXCAVATION AEC31ATP17 TERMINATED AT 1.00 m<br>Target depth                              |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 1.5                      | <div></div> |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 2.0                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 2.5                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 3.0                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 3.5                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 4.0                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 4.5                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        | 5.0                      |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        |                          |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |
|                                  |  |  |              |                        |                          |             |                |                                                                                         |                                                                                                                    |              |                       |                                    |                                                   |                                                      |

PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

## EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP18

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
 LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291888.9, N: 6258241.2 (56 MGA2020)

SURFACE ELEVATION : 36.70 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING |   |   |   | MATERIAL |                     |                                              |           |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|----------|---|---|---|----------|---------------------|----------------------------------------------|-----------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|--------------------|-------------|------------------|--------------------------|---------------------------------------------------|
| VE       | E | F | H | SUPPORT  | GROUND WATER LEVELS | SAMPLES & FIELD TESTS                        | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY | RELATIVE DENSITY | HAND PENETROMETER        | STRUCTURE & Other Observations                    |
|          |   |   |   |          |                     | ES<br>0.10m                                  | 0.0       |             |                       | FILL: silty SAND: dark grey-brown, fine to medium grained sand, trace rootlets, roots, wood                        | M                  |             |                  | 100<br>200<br>300<br>400 | FILL<br>0.00: PID<5                               |
|          |   |   |   |          | Not Observed        | 0.50m<br>ES<br>0.60m<br>0.70m<br>ES<br>0.80m | 0.5       |             | 0.60m                 | Silty CLAY: high plasticity, red-brown, trace fine to medium ironstone gravel                                      |                    |             |                  |                          | 0.50: PID<5                                       |
|          |   |   |   |          |                     | 1.10m<br>ES<br>1.20m                         | 1.0       |             | CH                    |                                                                                                                    | w-PL               | St          |                  | X                        | RESIDUAL SOIL<br>0.70: HP =150 kPa<br>0.70: PID<5 |
|          |   |   |   |          |                     |                                              |           |             | 1.20m                 | EXCAVATION AEC31ATP18 TERMINATED AT 1.20 m<br>Target depth                                                         |                    |             |                  | X                        | 1.10: HP =160 kPa<br>1.10: PID<5                  |
|          |   |   |   |          |                     |                                              | 1.5       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 2.0       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 2.5       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 3.0       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 3.5       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 4.0       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 4.5       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |
|          |   |   |   |          |                     |                                              | 5.0       |             |                       |                                                                                                                    |                    |             |                  |                          |                                                   |

PHOTOGRAPHS  
NOTES

YES



NO

## METHOD

N Natural Exposure  
 E Existing Excavation  
 BH Backhoe Bucket  
 B Bulldozer Blade  
 R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
 Level on Date shown  
 water inflow  
 water outflow

## SAMPLES &amp; FIELD TESTS

U50 - Undisturbed Sample  
 50 mm diameter  
 D - Disturbed Sample  
 B - Bulk Disturbed Sample  
 MC - Moisture Content  
 HP - Hand Penetrometer (UCS kPa)  
 VS - Vane Shear; P-Peak,  
 R-Remoulded (uncorrected kPa)  
 PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION  
Based on Unified  
Classification System

## MOISTURE

D - Dry  
 M - Moist  
 W - Wet

CONSISTENCY/  
RELATIVE DENSITY

VS - Very Soft  
 S - Soft  
 F - Firm  
 St - Stiff  
 VSt - Very Stiff  
 H - Hard  
 VL - Very Loose  
 L - Loose  
 MD - Medium Dense  
 D - Dense  
 VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP19

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291909.8, N: 6258261.1 (56 MGA2020)

SURFACE ELEVATION : 36.30 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          |           | MATERIAL       |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|-------------------|--|---------|------------------------|--------------------------|-----------|----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|--|-----------------------|------------------------------------|---------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |  | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations |                                                                                                                                                                              |  |
|                   |  |         | Not Observed           | ES<br>0.10m              | 0.0       |                |                          | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                                               |  | M                     |                                    |                           |                                   | FILL<br>0.00: PID<5<br><br>Field Replicate<br>BD2/20221209 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.40: HP =190 kPa<br>0.40: PID<5<br><br>0.80: HP =170 kPa<br>0.80: PID<5 |  |
|                   |  |         |                        | 0.40m<br>ES<br>0.50m     | 0.5       |                | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |  | w<PL                  | St                                 | X                         |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        | 0.80m<br>ES<br>0.90m     | 0.90m     |                |                          | EXCAVATION AEC31ATP19 TERMINATED AT 0.90 m<br>Target depth                                                         |  |                       |                                    | X                         |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 1.0       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 1.5       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 2.0       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 2.5       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 3.0       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 3.5       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 4.0       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 4.5       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |
|                   |  |         |                        |                          | 5.0       |                |                          |                                                                                                                    |  |                       |                                    |                           |                                   |                                                                                                                                                                              |  |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP20

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291846.1, N: 6258244.7 (56 MGA2020)

SURFACE ELEVATION : 37.60 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------|---------------------------------------------------|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |
|                   |         |                        | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets,<br>decomposed wood                      | M                                                           |                           | FILL<br>0.00: PID<5                               |
|                   |         |                        | 0.50m<br>ES<br>0.60m     | 0.5       |                                                                                     | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium<br>ironstone gravel                         | w-PL                                                        | St to<br>VSt              | RESIDUAL SOIL<br>0.50: HP =200 kPa<br>0.50: PID<5 |
|                   |         |                        | 1.00m<br>ES<br>1.10m     | 1.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           | 1.00: HP =180 kPa<br>1.00: PID<5                  |
|                   |         |                        |                          | 1.20m     |                                                                                     |                          | EXCAVATION AEC31ATP20 TERMINATED AT 1.20 m<br>Target depth                                                         |                                                             |                           |                                                   |
|                   |         |                        |                          | 1.5       |  |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                                                             |                           |                                                   |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water  
Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter

D - Disturbed Sample

B - Bulk Disturbed Sample

MC - Moisture Content

HP - Hand Penetrometer (UCS kPa)

VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)

PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP21

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291891.9, N: 6258269.3 (56 MGA2020)

SURFACE ELEVATION : 36.50 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |             |  |              | MATERIAL               |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|-------------------|--|-------------|--|--------------|------------------------|--------------------------|-----------|----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|-----------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------|
| VE<br>E<br>F<br>H |  | PENETRATION |  | SUPPORT      | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  | Not Observed |                        | ES<br>0.10m              | 0.0       |                |                          | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets, timber, trace fine gravel                    | M                     |                                    |                           |                                   | FILL<br>0.00: PID<5 |                                                                                                           |
|                   |  |             |  |              |                        | 0.30m<br>ES<br>0.40m     | 0.20m     |                |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |                       |                                    |                           |                                   |                     | Field Replicate<br>BD3/20221209 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.30: HP =160 kPa<br>0.30: PID<5 |
|                   |  |             |  |              |                        | 0.80m<br>ES<br>0.90m     | 0.5       | CI-CH          |                          |                                                                                                                    |                       | w-PL                               | St                        |                                   |                     | 0.80: HP =150 kPa<br>0.80: PID<5                                                                          |
|                   |  |             |  |              |                        |                          | 1.0       |                |                          | 1.30m                                                                                                              |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 1.5       |                |                          | EXCAVATION AEC31ATP21 TERMINATED AT 1.30 m<br>Target depth                                                         |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 2.0       |                |                          |                                 |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 2.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 3.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 3.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 4.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 4.5       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          | 5.0       |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |
|                   |  |             |  |              |                        |                          |           |                |                          |                                                                                                                    |                       |                                    |                           |                                   |                     |                                                                                                           |

PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

## EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP22

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
 LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291853.3, N: 6258271.4 (56 MGA2020)

SURFACE ELEVATION : 37.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

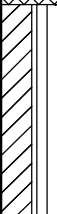
METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          |           | MATERIAL                                                                          |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|-------------------|--|---------|------------------------|--------------------------|-----------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |  |  |
|                   |  |         |                        |                          |           |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          |           |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          |           |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
| Not Observed      |  |         |                        | ES<br>0.10m              | 0.0       |  |                          | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets, roots, timber                           | M                     |                                    |                           | FILL<br>0.00: PID<5                               |  |  |
|                   |  |         |                        | 0.30m<br>ES<br>0.40m     | 0.20m     |  | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |                       |                                    | X                         | RESIDUAL SOIL<br>0.30: HP =200 kPa<br>0.30: PID<5 |  |  |
|                   |  |         |                        | 0.80m<br>ES<br>0.90m     | 0.5       |                                                                                   |                          |                                                                                                                    | w~PL                  | St to<br>VSt                       | X                         | 0.80: HP =180 kPa<br>0.80: PID<5                  |  |  |
|                   |  |         |                        |                          | 1.0       |                                                                                   |                          | EXCAVATION AEC31ATP22 TERMINATED AT 1.00 m<br>Target depth                                                         |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 1.5       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 2.0       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 2.5       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 3.0       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 3.5       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 4.0       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 4.5       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |
|                   |  |         |                        |                          | 5.0       |                                                                                   |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |

PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
 E Existing Excavation  
 BH Backhoe Bucket  
 B Bulldozer Blade  
 R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
 water inflow  
 water outflow

## SAMPLES &amp; FIELD TESTS

U50 - Undisturbed Sample  
 50 mm diameter  
 D - Disturbed Sample  
 B - Bulk Disturbed Sample  
 MC - Moisture Content  
 HP - Hand Penetrometer (UCS kPa)  
 VS - Vane Shear; P-Peak,  
 R-Remoulded (uncorrected kPa)  
 PBT - Plate Bearing Test

CLASSIFICATION SYMBOLS & SOIL DESCRIPTION  
Based on Unified Classification System

## MOISTURE

D - Dry  
 M - Moist  
 W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
 S - Soft  
 F - Firm  
 St - Stiff  
 VSt - Very Stiff  
 H - Hard  
 VL - Very Loose  
 L - Loose  
 MD - Medium Dense  
 D - Dense  
 VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP23

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291890.4, N: 6258291.0 (56 MGA2020)

SURFACE ELEVATION : 36.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|--|--|--|--|--|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |  |  |  |  |  |
|                   |         |                        | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets,<br>trace fine gravel                    | M                     |                                    |                           | FILL<br>0.00: PID<5                               |  |  |  |  |  |
|                   |         |                        | 0.30m<br>ES<br>0.40m     | 0.20m     |                                                                                     |                          | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium<br>ironstone gravel                         |                       |                                    | X                         | RESIDUAL SOIL<br>0.30: HP =210 kPa<br>0.30: PID<5 |  |  |  |  |  |
|                   |         | Not Observed           | 0.80m<br>ES<br>0.90m     | 0.5       |                                                                                     | CI-CH                    |                                                                                                                    | w-PL                  | St to<br>VSt                       | X                         | 0.80: HP =190 kPa<br>0.80: PID<5                  |  |  |  |  |  |
|                   |         |                        |                          | 1.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 1.20m     |                                                                                     |                          | EXCAVATION AEC31ATP23 TERMINATED AT 1.20 m<br>Target depth                                                         |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 1.5       |  |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          |           |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |

PHOTOGRAPHS  
NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water  
Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter

D - Disturbed Sample

B - Bulk Disturbed Sample

MC - Moisture Content

HP - Hand Penetrometer (UCS kPa)

VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)

PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS &  
SOIL DESCRIPTION**  
Based on Unified  
Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/  
RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP24

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291863.9, N: 6258314.8 (56 MGA2020)

SURFACE ELEVATION : 36.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING |   |   |   | MATERIAL |                     |                       |           |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|----------|---|---|---|----------|---------------------|-----------------------|-----------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------|-------------------|---------------------------------------------------|
| VE       | E | F | H | SUPPORT  | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE CONDITION | CONSISTENCY RELATIVE DENSITY | HAND PENETROMETER | STRUCTURE & Other Observations                    |
|          |   |   |   |          |                     | ES 0.10m              | 0.0       |             |                       | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets, decomposed wood                         | M                  |                              |                   | FILL<br>0.00: PID<5                               |
|          |   |   |   |          |                     | 0.40m ES<br>0.50m ES  | 0.30m     |             |                       | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel, trace decomposed wood     | w-PL               | St to VSt                    | X                 | RESIDUAL SOIL<br>0.40: HP =260 kPa<br>0.40: PID<5 |
|          |   |   |   |          |                     | 0.90m ES<br>1.00m ES  | 0.5       |             | CI-CH                 |                                                                                                                    |                    |                              | X                 | 0.90: HP =200 kPa<br>0.90: PID<5                  |
|          |   |   |   |          |                     |                       | 1.0       |             |                       | EXCAVATION AEC31ATP24 TERMINATED AT 1.10 m<br>Target depth                                                         |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 1.5       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 2.0       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 2.5       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 3.0       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 3.5       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 4.0       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 4.5       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |
|          |   |   |   |          |                     |                       | 5.0       |             |                       |                                                                                                                    |                    |                              |                   |                                                   |

PHOTOGRAPHS NOTES

☒ YES ☐ NO

**METHOD**

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

**SUPPORT**

T Timbering

**PENETRATION**

VE WH VH

No Resistance

**WATER**

10 Oct., 73 Water Level on Date shown

water inflow

water outflow

**SAMPLES & FIELD TESTS**

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

**CLASSIFICATION SYMBOLS & SOIL DESCRIPTION**  
Based on Unified Classification System

**MOISTURE**

D - Dry  
M - Moist  
W - Wet

**CONSISTENCY/ RELATIVE DENSITY**

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP25

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291888.7, N: 6258314.1 (56 MGA2020)

SURFACE ELEVATION : 35.40 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING    |             |             |             | MATERIAL     |                     |                       |           |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|-------------|-------------|-------------|-------------|--------------|---------------------|-----------------------|-----------|-------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------------------------------|-----------------------------------|
| VE          | E           | F           | H           | SUPPORT      | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL                                                                   | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER                         | STRUCTURE<br>& Other Observations |
| <div></div> | <div></div> | <div></div> | <div></div> | Not Observed | Not Observed        | ES<br>0.10m           | 0.0       | <div></div> |                                                                                         | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                                               | M                     |                                    |                                                   | FILL<br>0.00: PID<5               |
|             |             |             |             |              |                     | 0.30m                 |           | 0.20m       | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel | w<PL                                                                                                               | St to VSt             | <div></div> <div></div>            | RESIDUAL SOIL<br>0.30: HP =230 kPa<br>0.30: PID<5 |                                   |
|             |             |             |             |              |                     | ES<br>0.40m           | 0.5       | <div></div> |                                                                                         |                                                                                                                    |                       |                                    |                                                   | CI-CH                             |
|             |             |             |             |              |                     | 0.80m                 |           | 0.90m       |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     | ES<br>0.90m           | 1.0       |             | EXCAVATION AEC31ATP25 TERMINATED AT 0.90 m<br>Target depth                              |                                                                                                                    |                       |                                    | 0.80: HP =180 kPa<br>0.80: PID<5                  |                                   |
|             |             |             |             |              |                     |                       | 1.5       |             |                                                                                         |                                 |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 2.0       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 2.5       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 3.0       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 3.5       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 4.0       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 4.5       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |
|             |             |             |             |              |                     |                       | 5.0       |             |                                                                                         |                                                                                                                    |                       |                                    |                                                   |                                   |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

## EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP26

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291867.6, N: 6258354.7 (56 MGA2020)

SURFACE ELEVATION : 34.50 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 08/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING |   |   |   | MATERIAL |                     |                       |           |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|----------|---|---|---|----------|---------------------|-----------------------|-----------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------|
| VE       | E | F | H | SUPPORT  | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE DENSITY | HAND PENETROMETER<br>100 200 300 400 | STRUCTURE<br>& Other Observations                                                                         |
|          |   |   |   |          |                     | ES 0.10m              | 0.0       |             |                       | FILL: silty SAND: dark brown, fine to medium grained sand, trace rootlets                                          | M                     |                                 |                                      | FILL<br>0.00: PID<5                                                                                       |
|          |   |   |   |          |                     | 0.30m ES 0.40m        | 0.25m     |             |                       | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium gravel                                      |                       |                                 | ×                                    | Field Replicate<br>BD1/20221208 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.30: HP ≈180 kPa<br>0.30: PID<5 |
|          |   |   |   |          | Not Observed        | 0.80m ES 0.90m        | 0.5       |             | CI-CH                 |                                                                                                                    | w-PL                  | St                              | ×                                    | 0.80: HP ≈160 kPa<br>0.80: PID<5                                                                          |
|          |   |   |   |          |                     |                       | 1.0       |             |                       | EXCAVATION AEC31ATP26 TERMINATED AT 1.00 m<br>Target depth                                                         |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 1.5       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 2.0       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 2.5       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 3.0       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 3.5       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 4.0       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 4.5       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |
|          |   |   |   |          |                     |                       | 5.0       |             |                       |                                                                                                                    |                       |                                 |                                      |                                                                                                           |

PHOTOGRAPHS NOTES ☒ YES ☐ NO

| METHOD                                                                                            | PENETRATION                                                                                                                                                                                                                                                                                                                                                                                                                             | SAMPLES & FIELD TESTS                                                                                                                                                                                                                                 | CLASSIFICATION SYMBOLS & SOIL DESCRIPTION<br>Based on Unified Classification System | CONSISTENCY/RELATIVE DENSITY                                                                                                                                              |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N Natural Exposure<br>E Existing Excavation<br>BH Backhoe Bucket<br>B Bulldozer Blade<br>R Ripper |  No Resistance<br> 10 Oct., 73 Water Level on Date shown<br> water inflow<br> water outflow | U50 - Undisturbed Sample<br>50 mm diameter<br>D - Disturbed Sample<br>B - Bulk Disturbed Sample<br>MC - Moisture Content<br>HP - Hand Penetrometer (UCS kPa)<br>VS - Vane Shear; P-Peak,<br>R-Remoulded (uncorrected kPa)<br>PBT - Plate Bearing Test | <b>MOISTURE</b><br>D - Dry<br>M - Moist<br>W - Wet                                  | VS - Very Soft<br>S - Soft<br>F - Firm<br>St - Stiff<br>VSt - Very Stiff<br>H - Hard<br>VL - Very Loose<br>L - Loose<br>MD - Medium Dense<br>D - Dense<br>VD - Very Dense |

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP27

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291891.2, N: 6258345.4 (56 MGA2020)

SURFACE ELEVATION : 34.40 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          |           | MATERIAL                                                                            |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|-------------------|--|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|--|-----------------------|------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |  | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                                                                                                                                            |  |  |
|                   |  |         | Not Observed           | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: brown, fine to medium grained sand, trace rootlets                                               |  | M                     |                                    |                           | FILL<br>0.00: PID<5<br><br>Field Replicate<br>BD4/20221209 taken at<br>0.0-0.1m<br>RESIDUAL SOIL<br>0.40: HP =190 kPa<br>0.40: PID<5<br><br>0.90: HP =170 kPa<br>0.90: PID<5 |  |  |
|                   |  |         |                        | 0.40m<br>ES<br>0.50m     | 0.5       |                                                                                     | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |  | w-PL                  | St                                 | X                         |                                                                                                                                                                              |  |  |
|                   |  |         |                        | 0.90m<br>ES<br>1.00m     | 1.0       |                                                                                     |                          | EXCAVATION AEC31ATP27 TERMINATED AT 1.00 m<br>Target depth                                                         |  |                       |                                    | X                         |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 1.5       |  |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |
|                   |  |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |  |                       |                                    |                           |                                                                                                                                                                              |  |  |



PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP28

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291889.3, N: 6258369.0 (56 MGA2020)

SURFACE ELEVATION : 33.20 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |             |  |         |  | MATERIAL            |  |                       |  |           |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|-------------------|--|-------------|--|---------|--|---------------------|--|-----------------------|--|-----------|--|-------------|--|-----------------------|--|--------------------------------------------------------------------------------------------------------------------|--|--------------------|--|------------------------------|--|-----------------------------------|--|---------------------------------------------------|--|
| VE<br>E<br>F<br>H |  | PENETRATION |  | SUPPORT |  | GROUND WATER LEVELS |  | SAMPLES & FIELD TESTS |  | DEPTH (m) |  | GRAPHIC LOG |  | CLASSIFICATION SYMBOL |  | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |  | MOISTURE CONDITION |  | CONSISTENCY RELATIVE DENSITY |  | HAND PENETROMETER<br>kPa<br>METER |  | STRUCTURE & Other Observations                    |  |
|                   |  |             |  |         |  |                     |  | ES<br>0.10m           |  | 0.0       |  |             |  | 0.25m                 |  | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets, trace fine to medium gravel             |  | M                  |  |                              |  | 100<br>200<br>300<br>400          |  | FILL<br>0.00: PID<5                               |  |
|                   |  |             |  |         |  | Not Observed        |  | 0.30m<br>ES<br>0.40m  |  | 0.5       |  |             |  | CI-CH                 |  | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |  | w-PL               |  | St                           |  | X                                 |  | RESIDUAL SOIL<br>0.30: HP =180 kPa<br>0.30: PID<5 |  |
|                   |  |             |  |         |  |                     |  | 0.80m<br>ES<br>0.90m  |  | 1.0       |  |             |  | 1.00m                 |  | EXCAVATION AEC31ATP28 TERMINATED AT 1.00 m<br>Target depth                                                         |  |                    |  |                              |  | X                                 |  | 0.80: HP =170 kPa<br>0.80: PID<5                  |  |
|                   |  |             |  |         |  |                     |  |                       |  | 1.5       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 2.0       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 2.5       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 3.0       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 3.5       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 4.0       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 4.5       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |
|                   |  |             |  |         |  |                     |  |                       |  | 5.0       |  |             |  |                       |  |                                                                                                                    |  |                    |  |                              |  |                                   |  |                                                   |  |

PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP29

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291859.8, N: 6258372.2 (56 MGA2020)

SURFACE ELEVATION : 34.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |         |                        |                          | MATERIAL  |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|-------------------|---------|------------------------|--------------------------|-----------|-------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|--|--|--|--|--|
| VE<br>PENETRATION | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG                                                                      | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |  |  |  |  |  |
|                   |         |                        | ES<br>0.10m              | 0.0       |                                                                                     |                          | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets, timber                                  | M                     |                                    |                           | FILL<br>0.00: PID<5                               |  |  |  |  |  |
|                   |         |                        | 0.40m<br>ES<br>0.50m     | 0.5       |                                                                                     | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                  | St to VSt                          | X                         | RESIDUAL SOIL<br>0.40: HP =190 kPa<br>0.40: PID<5 |  |  |  |  |  |
|                   |         |                        | 0.80m<br>ES<br>0.90m     | 1.0       |                                                                                     |                          | EXCAVATION AEC31ATP29 TERMINATED AT 1.00 m<br>Target depth                                                         |                       |                                    | X                         | 0.80: HP =210 kPa<br>0.80: PID<5                  |  |  |  |  |  |
|                   |         |                        |                          | 1.5       |  |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 2.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 3.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 4.5       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |
|                   |         |                        |                          | 5.0       |                                                                                     |                          |                                                                                                                    |                       |                                    |                           |                                                   |  |  |  |  |  |

PHOTOGRAPHS  
NOTES ☒ YES ☐ NO

| METHOD                                                                                            | PENETRATION                                                                                                                                                                                  | SAMPLES & FIELD TESTS                                                                                                                                                                                                                                 | CLASSIFICATION SYMBOLS &<br>SOIL DESCRIPTION<br>Based on Unified<br>Classification System | CONSISTENCY/<br>RELATIVE DENSITY                                                                                                                                          |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N Natural Exposure<br>E Existing Excavation<br>BH Backhoe Bucket<br>B Bulldozer Blade<br>R Ripper |  <p>No Resistance</p> <p>10 Oct., 73 Water<br/>Level on Date shown<br/>water inflow<br/>water outflow</p> | U50 - Undisturbed Sample<br>50 mm diameter<br>D - Disturbed Sample<br>B - Bulk Disturbed Sample<br>MC - Moisture Content<br>HP - Hand Penetrometer (UCS kPa)<br>VS - Vane Shear; P-Peak,<br>R-Remoulded (uncorrected kPa)<br>PBT - Plate Bearing Test | <b>MOISTURE</b><br>D - Dry<br>M - Moist<br>W - Wet                                        | VS - Very Soft<br>S - Soft<br>F - Firm<br>St - Stiff<br>VSt - Very Stiff<br>H - Hard<br>VL - Very Loose<br>L - Loose<br>MD - Medium Dense<br>D - Dense<br>VD - Very Dense |
| <b>SUPPORT</b><br>T Timbering                                                                     |                                                                                                                                                                                              |                                                                                                                                                                                                                                                       |                                                                                           |                                                                                                                                                                           |

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP30

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291865.9, N: 6258400.9 (56 MGA2020)

SURFACE ELEVATION : 32.00 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING |   |   |   | MATERIAL |                     |                       |           |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|----------|---|---|---|----------|---------------------|-----------------------|-----------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------------|-----------------------------------------------|---------------------------------------------------|
| VE       | E | F | H | SUPPORT  | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE DENSITY | HAND PENETROMETER<br>100<br>200<br>300<br>400 | STRUCTURE<br>& Other Observations                 |
|          |   |   |   |          |                     | ES<br>0.10m           | 0.0       |             |                       | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets                                          | M                     |                                 |                                               | FILL<br>0.00: PID<5                               |
|          |   |   |   |          | Not Observed        | 0.40m<br>ES<br>0.50m  | 0.5       |             | CI-CH                 | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                  | St to VSt                       | X                                             | RESIDUAL SOIL<br>0.40: HP =200 kPa<br>0.40: PID<5 |
|          |   |   |   |          |                     | 0.90m<br>ES<br>1.00m  | 1.0       |             |                       | EXCAVATION AEC31ATP30 TERMINATED AT 1.00 m<br>Target depth                                                         |                       |                                 | X                                             | 0.90: HP =180 kPa<br>0.90: PID<5                  |
|          |   |   |   |          |                     |                       | 1.5       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 2.0       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 2.5       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 3.0       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 3.5       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 4.0       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 4.5       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |
|          |   |   |   |          |                     |                       | 5.0       |             |                       |                                                                                                                    |                       |                                 |                                               |                                                   |



PHOTOGRAPHS NOTES ☒ YES ☐ NO

|                                                                                                                    |                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                        |                                                                                                                                                          |                                                                                                                                                                                                                   |
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| <b>METHOD</b><br>N Natural Exposure<br>E Existing Excavation<br>BH Backhoe Bucket<br>B Bulldozer Blade<br>R Ripper | <b>PENETRATION</b><br> No Resistance<br><br><b>WATER</b><br>10 Oct., 73 Water Level on Date shown<br>water inflow<br>water outflow | <b>SAMPLES &amp; FIELD TESTS</b><br>U50 - Undisturbed Sample<br>50 mm diameter<br>D - Disturbed Sample<br>B - Bulk Disturbed Sample<br>MC - Moisture Content<br>HP - Hand Penetrometer (UCS kPa)<br>VS - Vane Shear; P-Peak, R-Remoulded (uncorrected kPa)<br>PBT - Plate Bearing Test | <b>CLASSIFICATION SYMBOLS &amp; SOIL DESCRIPTION</b><br>Based on Unified Classification System<br><br><b>MOISTURE</b><br>D - Dry<br>M - Moist<br>W - Wet | <b>CONSISTENCY/ RELATIVE DENSITY</b><br>VS - Very Soft<br>S - Soft<br>F - Firm<br>St - Stiff<br>VSt - Very Stiff<br>H - Hard<br>VL - Very Loose<br>L - Loose<br>MD - Medium Dense<br>D - Dense<br>VD - Very Dense |
|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP31

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291878.8, N: 6258387.6 (56 MGA2020)

SURFACE ELEVATION : 32.70 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING          |  |         |                        |                          |           | MATERIAL       |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|-------------------|--|---------|------------------------|--------------------------|-----------|----------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|--|--|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|---------------------|-----------------------------------|
| VE<br>E<br>F<br>H |  | SUPPORT | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m) | GRAPHIC<br>LOG | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components |  |  | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER |                                                   |                     | STRUCTURE<br>& Other Observations |
|                   |  |         | Not Observed           | ES<br>0.10m              | 0.0       |                |                          | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets, timber                                  |  |  | D                     |                                    |                           |                                                   | FILL<br>0.00: PID<5 |                                   |
|                   |  |         |                        | 0.40m<br>ES<br>0.50m     | 0.5       |                | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            |  |  | w<PL                  | VSt                                | X                         | RESIDUAL SOIL<br>0.40: HP =250 kPa<br>0.40: PID<5 |                     |                                   |
|                   |  |         |                        | 0.90m<br>ES<br>1.00m     | 1.0       |                |                          | EXCAVATION AEC31ATP31 TERMINATED AT 1.00 m<br>Target depth                                                         |  |  |                       |                                    | X                         | 0.90: HP =260 kPa<br>0.90: PID<5                  |                     |                                   |
|                   |  |         |                        |                          |           |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 1.5       |                |                          |                                 |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 2.0       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 2.5       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 3.0       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 3.5       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 4.0       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 4.5       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |
|                   |  |         |                        |                          | 5.0       |                |                          |                                                                                                                    |  |  |                       |                                    |                           |                                                   |                     |                                   |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water  
Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified  
Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP32

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

POSITION : E: 291893.6, N: 6258390.4 (56 MGA2020)

SURFACE ELEVATION : 31.80 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING    |             |             |             | MATERIAL     |                     |                       |           |             |                       |                                                                                                                    |                       |                                    |                           |                                                   |
|-------------|-------------|-------------|-------------|--------------|---------------------|-----------------------|-----------|-------------|-----------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------------|---------------------------------------------------|
| VE          | E           | F           | H           | SUPPORT      | GROUND WATER LEVELS | SAMPLES & FIELD TESTS | DEPTH (m) | GRAPHIC LOG | CLASSIFICATION SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION | CONSISTENCY<br>RELATIVE<br>DENSITY | HAND<br>PENETRO-<br>METER | STRUCTURE<br>& Other Observations                 |
| <div></div> | <div></div> | <div></div> | <div></div> | Not Observed |                     | ES<br>0.10m           | 0.0       | <div></div> |                       | FILL: silty SAND: pale brown, fine to medium grained sand, trace rootlets, timber                                  | M                     |                                    |                           | FILL<br>0.00: PID<5                               |
|             |             |             |             |              |                     | 0.50m<br>ES<br>0.60m  | 0.5       |             |                       |                                                                                                                    |                       |                                    |                           |                                                   |
|             |             |             |             |              |                     | 1.00m<br>ES<br>1.10m  | 1.0       | <div></div> | CI-CH                 | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                  | St                                 | X                         | RESIDUAL SOIL<br>1.00: HP =180 kPa<br>1.00: PID<5 |
|             |             |             |             |              |                     | 1.40m<br>ES<br>1.50m  | 1.5       |             |                       |                                                                                                                    |                       |                                    |                           | X                                                 |
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|             |             |             |             |              |                     |                       |           |             |                       |                                                                                                                    | </                    |                                    |                           |                                                   |



PHOTOGRAPHS  
NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# EXCAVATION - GEOLOGICAL LOG

PIT NO : AEC31ATP33

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01

SHEET : 1 OF 1

POSITION : E: 291854.5, N: 6258418.4 (56 MGA2020)

SURFACE ELEVATION : 31.70 (mAHD)

EQUIPMENT TYPE : 12 tonne Excavator

METHOD : 800mm bucket

DATE EXCAVATED : 09/12/22

LOGGED BY : PJ

CHECKED BY : MB

EXCAVATION DIMENSIONS : 1.00 m LONG 0.80 m WIDE

| DRILLING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               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PHOTOGRAPHS NOTES



YES



NO

## METHOD

N Natural Exposure  
E Existing Excavation  
BH Backhoe Bucket  
B Bulldozer Blade  
R Ripper

## SUPPORT

T Timbering

## PENETRATION



No Resistance

## WATER

10 Oct., 73 Water Level on Date shown  
water inflow  
water outflow

## SAMPLES & FIELD TESTS

U50 - Undisturbed Sample  
50 mm diameter  
D - Disturbed Sample  
B - Bulk Disturbed Sample  
MC - Moisture Content  
HP - Hand Penetrometer (UCS kPa)  
VS - Vane Shear; P-Peak,  
R-Remoulded (uncorrected kPa)  
PBT - Plate Bearing Test

## CLASSIFICATION SYMBOLS & SOIL DESCRIPTION

Based on Unified Classification System

## MOISTURE

D - Dry  
M - Moist  
W - Wet

## CONSISTENCY/ RELATIVE DENSITY

VS - Very Soft  
S - Soft  
F - Firm  
St - Stiff  
VSt - Very Stiff  
H - Hard  
VL - Very Loose  
L - Loose  
MD - Medium Dense  
D - Dense  
VD - Very Dense

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA34

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291880.5, N: 6258413.7 (56 MGA2020) SURFACE ELEVATION : 31.60 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING                       |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|--------------------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------------|
| PROGRESS                       |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations                                       |
| DRILLING<br>& CASING           | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
| DRILLING<br>& CASING<br>↑ HA ↓ |            | m                       | Not Observed           |                          | 0.0<br>31.6             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, fine to medium sand, trace rootlets                        | w<PL                                                        | FILL<br>0.00: PID<5<br><br>Field Replicate BD1/20221216 taken at 0-0.1m |
|                                |            |                         |                        |                          | 0.30m                   |                                                                                   |                          | BOREHOLE AEC31AHA34 TERMINATED AT 0.30 m<br>Refusal<br>Tree roots present                                          |                                                             |                                                                         |
|                                |            |                         |                        |                          | 0.5<br>31.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 1.0<br>30.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 1.5<br>30.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 2.0<br>29.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 2.5<br>29.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 3.0<br>28.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 3.5<br>28.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 4.0<br>27.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 4.5<br>27.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |
|                                |            |                         |                        |                          | 5.0<br>26.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                                                         |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA35

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291895.6, N: 6258407.7 (56 MGA2020) SURFACE ELEVATION : 31.20 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING                                |            |                         |                        |                          | MATERIAL                                                                                                                                                            |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|-----------------------------------------|------------|-------------------------|------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------|-----------------------------------|
| PROGRESS                                |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD)                                                                                                                                             | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION                                                    | CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |
| DRILLING<br>& CASING                    | WATER LOSS |                         |                        |                          |                                                                                                                                                                     |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
| <div>↑</div> <div>HA</div> <div>↓</div> |            | E                       | Not Observed           | ES<br>0.10m              | 0.0<br>31.2                                                                                                                                                         |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, fine to medium sand, trace rootlets                        | w<PL                                                                     |                                    | FILL<br>0.00: PID<5               |
|                                         |            | F                       |                        | 0.40m                    |   | CI-CH                                                                             | 0.20m                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                                                                     | St to<br>VSt                       | RESIDUAL SOIL<br><br>0.40: PID<5  |
|                                         |            |                         |                        | ES<br>0.50m              |                                                                                                                                                                     |                                                                                   | 0.5<br>30.7              | At 0.6m: becoming cemented                                                                                         |                                                                          |                                    |                                   |
|                                         |            |                         |                        | H                        |                                                                                                                                                                     |                                                                                   | 0.70m                    |                                                                                                                    | BOREHOLE AEC31AHA35 TERMINATED AT 0.70 m<br>Refusal<br>Hard clay present |                                    |                                   |
|                                         |            |                         |                        |                          | 1.0<br>30.2                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 1.5<br>29.7                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 2.0<br>29.2                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 2.5<br>28.7                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 3.0<br>28.2                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 3.5<br>27.7                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 4.0<br>27.2                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 4.5<br>26.7                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |
|                                         |            |                         |                        |                          | 5.0<br>26.2                                                                                                                                                         |                                                                                   |                          |                                                                                                                    |                                                                          |                                    |                                   |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA36

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291848.3, N: 6258439.3 (56 MGA2020) SURFACE ELEVATION : 31.60 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING                             |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|--------------------------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|
| PROGRESS                             |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |
| DRILLING<br>& CASING                 | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
| DRILLING<br>& CASING<br>↑<br>HA<br>↓ |            | m                       | Not Observed           |                          | 0.0<br>31.6             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, fine to medium sand, trace rootlets                        | w<PL                                                        | FILL<br>0.00: PID<5               |
|                                      |            |                         |                        |                          | 0.25m                   |                                                                                   |                          | BOREHOLE AEC31AHA36 TERMINATED AT 0.25 m<br>Refusal<br>Tree roots present                                          |                                                             |                                   |
|                                      |            |                         |                        |                          | 0.5<br>31.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 1.0<br>30.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 1.5<br>30.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 2.0<br>29.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 2.5<br>29.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 3.0<br>28.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 3.5<br>28.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 4.0<br>27.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 4.5<br>27.1             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                                      |            |                         |                        |                          | 5.0<br>26.6             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA37

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291885.9, N: 6258433.3 (56 MGA2020) SURFACE ELEVATION : 31.00 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING             |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|----------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|-------------|
| PROGRESS             |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |             |
| DRILLING<br>& CASING | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
| ↑<br>HA<br>↓         |            | E                       |                        | ES<br>0.10m              | 0.0<br>31.0             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, trace rootlets                                             | w<PL                                                        | FILL<br>0.00: PID<5               |             |
|                      |            | F                       | Not Observed           | 0.30m<br>ES<br>0.40m     | 0.25m                   |  | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                                                        | St to<br>VSt                      |             |
|                      |            |                         |                        | 0.80m<br>ES<br>0.90m     | 0.90m                   |                                                                                   |                          |                                                                                                                    |                                                             |                                   | 0.80: PID<5 |
|                      |            |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 1.0<br>30.0             |                                                                                   |                          | BOREHOLE AEC31AHA37 TERMINATED AT 0.90 m<br>Target depth                                                           |                                                             |                                   |             |
|                      |            |                         |                        |                          | 1.5<br>29.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 2.0<br>29.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 2.5<br>28.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 3.0<br>28.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 3.5<br>27.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 4.0<br>27.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 4.5<br>26.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |
|                      |            |                         |                        |                          | 5.0<br>26.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |             |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA38

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291902.0, N: 6258440.5 (56 MGA2020) SURFACE ELEVATION : 28.40 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING             |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|----------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|
| PROGRESS             |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components                                     | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |
| DRILLING<br>& CASING | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
| ↑<br>HA<br>↓         |            | E                       |                        | ES<br>0.10m              | 0.0<br>28.4             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, trace rootlets                                                                                 | w<PL                                                        | FILL<br>0.00: PID<5               |
|                      |            | F                       | Not Observed           | 0.20m                    | 0.5<br>27.9             |  | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                                                                | w<PL                                                        | St to<br>VSt<br><br>0.70: PID<5   |
|                      |            |                         |                        | ES<br>0.30m              |                         |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        | 0.70m                    |                         |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        | ES<br>0.80m              |                         |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 0.90m                   |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 1.0<br>27.4             |                                                                                   |                          | BOREHOLE AEC31AHA38 TERMINATED AT 0.90 m<br>Target depth<br>Test location estimated from site features and surface elevation extracted from LIDAR data |                                                             |                                   |
|                      |            |                         |                        |                          | 1.5<br>26.9             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 2.0<br>26.4             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 2.5<br>25.9             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 3.0<br>25.4             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 3.5<br>24.9             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 4.0<br>24.4             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 4.5<br>23.9             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |
|                      |            |                         |                        |                          | 5.0<br>23.4             |                                                                                   |                          |                                                                                                                                                        |                                                             |                                   |

See Explanatory Notes for details of abbreviations & basis of descriptions.

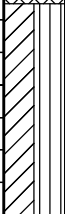
# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA39

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291856.1, N: 6258443.9 (56 MGA2020) SURFACE ELEVATION : 29.00 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING             |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|----------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|
| PROGRESS             |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |
| DRILLING<br>& CASING | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
| ↑<br>HA<br>↓         |            | E                       |                        | ES<br>0.10m              | 0.0<br>29.0             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, trace rootlets                                             | w<PL                                                        | FILL<br>0.00: PID<5               |
|                      |            | F                       | Not Observed           | 0.30m<br>ES<br>0.40m     | 0.5<br>28.5             |  | CI-CH                    | Silty CLAY: medium to high plasticity, red-brown, trace fine to medium ironstone gravel                            | w<PL                                                        | St to<br>VSt                      |
|                      |            |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        | 0.80m<br>ES<br>0.90m     |                         |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 1.0<br>28.0             |                                                                                   |                          | BOREHOLE AEC31AHA39 TERMINATED AT 0.90 m<br>Target depth                                                           |                                                             |                                   |
|                      |            |                         |                        |                          | 1.5<br>27.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 2.0<br>27.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 2.5<br>26.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 3.0<br>26.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 3.5<br>25.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 4.0<br>25.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 4.5<br>24.5             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |
|                      |            |                         |                        |                          | 5.0<br>24.0             |                                                                                   |                          |                                                                                                                    |                                                             |                                   |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# NON-CORE DRILL HOLE - GEOLOGICAL LOG

HOLE NO : AEC31AHA40

PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291885.5, N: 6258462.7 (56 MGA2020) SURFACE ELEVATION : 30.50 (mAHD) ANGLE FROM HORIZONTAL : 90°  
RIG TYPE : Hand Tools MOUNTING : Hand Tools CONTRACTOR : Douglas Partners DRILLER : PJ  
DATE STARTED : 16/12/22 DATE COMPLETED : 16/12/22 DATE LOGGED : 16/12/22 LOGGED BY : PJ CHECKED BY : MB

| DRILLING                       |            |                         |                        |                          | MATERIAL                |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|--------------------------------|------------|-------------------------|------------------------|--------------------------|-------------------------|-----------------------------------------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------|
| PROGRESS                       |            | DRILLING<br>PENETRATION | GROUND WATER<br>LEVELS | SAMPLES &<br>FIELD TESTS | DEPTH (m)<br>RL (m AHD) | GRAPHIC<br>LOG                                                                    | CLASSIFICATION<br>SYMBOL | MATERIAL DESCRIPTION<br>Soil Type, Colour, Plasticity or Particle Characteristic<br>Secondary and Minor Components                                                      | MOISTURE<br>CONDITION<br>CONSISTENCY<br>RELATIVE<br>DENSITY | STRUCTURE<br>& Other Observations |
| DRILLING<br>& CASING           | WATER LOSS |                         |                        |                          |                         |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
| DRILLING<br>& CASING<br>↑ HA ↓ |            | m                       | Not Observed           |                          | 0.0<br>30.5             |  |                          | FILL: sandy SILT: low to medium plasticity, pale brown, fine to medium sand, trace rootlets, fine gravel and timber                                                     | w<PL                                                        | FILL<br>0.00: PID<5               |
|                                |            |                         |                        |                          | 0.30m                   |                                                                                   |                          | BOREHOLE AEC31AHA40 TERMINATED AT 0.30 m<br>Refusal<br>Tree roots present<br>Test location estimated from site features and surface elevation extracted from LIDAR data |                                                             |                                   |
|                                |            |                         |                        |                          | 0.5<br>30.0             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 1.0<br>29.5             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 1.5<br>29.0             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 2.0<br>28.5             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 2.5<br>28.0             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 3.0<br>27.5             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 3.5<br>27.0             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 4.0<br>26.5             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 4.5<br>26.0             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |
|                                |            |                         |                        |                          | 5.0<br>25.5             |                                                                                   |                          |                                                                                                                                                                         |                                                             |                                   |

See Explanatory Notes for details of abbreviations & basis of descriptions.

# PIEZOMETER CONSTRUCTION

HOLE NO : AEC31A-BH01

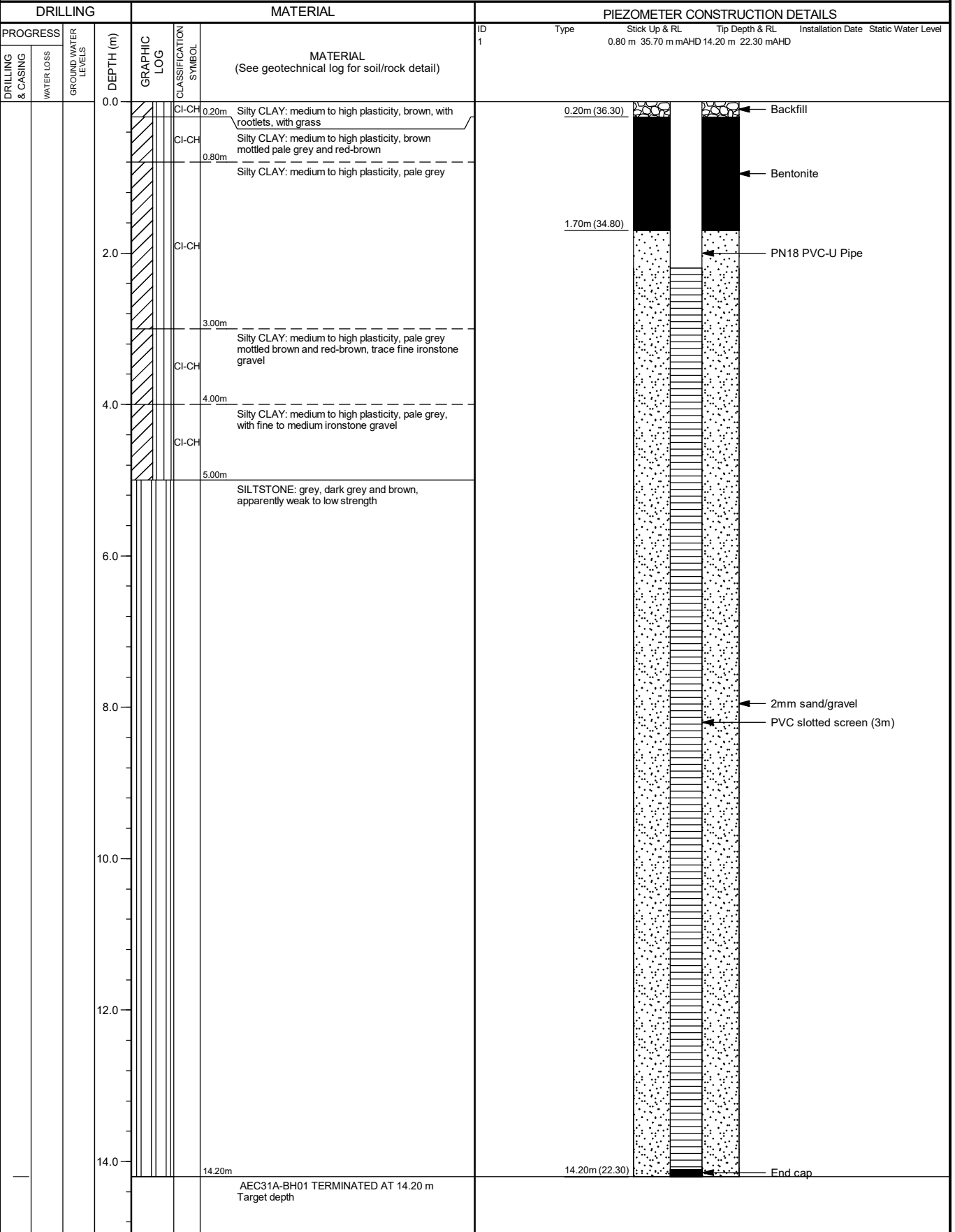
PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291863.5, N: 6258111.0 (56 MGA2020) SURFACE ELEVATION : 36.50 (mAHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HANJIN DB8 MOUNTING : Track CONTRACTOR : Rockwell

DATE STARTED : 02/02/23 DATE COMPLETED : 02/02/23 DATE LOGGED : 02/02/23 LOGGED BY : JS CHECKED BY : MB



RMS LIB 40.3.14 GJB Log RTA PIEZOMETER INSTALLATION LOG 1 AEC\_GROUNDWATER WELLS.GPJ <<DrawingFile>> 17/Feb/2023 15:58 10.02.00.04 Datagel Tools

This report of well/VWP installation must be read in conjunction with accompanying notes and abbreviations. The geotechnical log is a summary only and the detailed log should be referred to for strata details and any core loss zones.

# PIEZOMETER CONSTRUCTION

HOLE NO : AEC31A-BH02

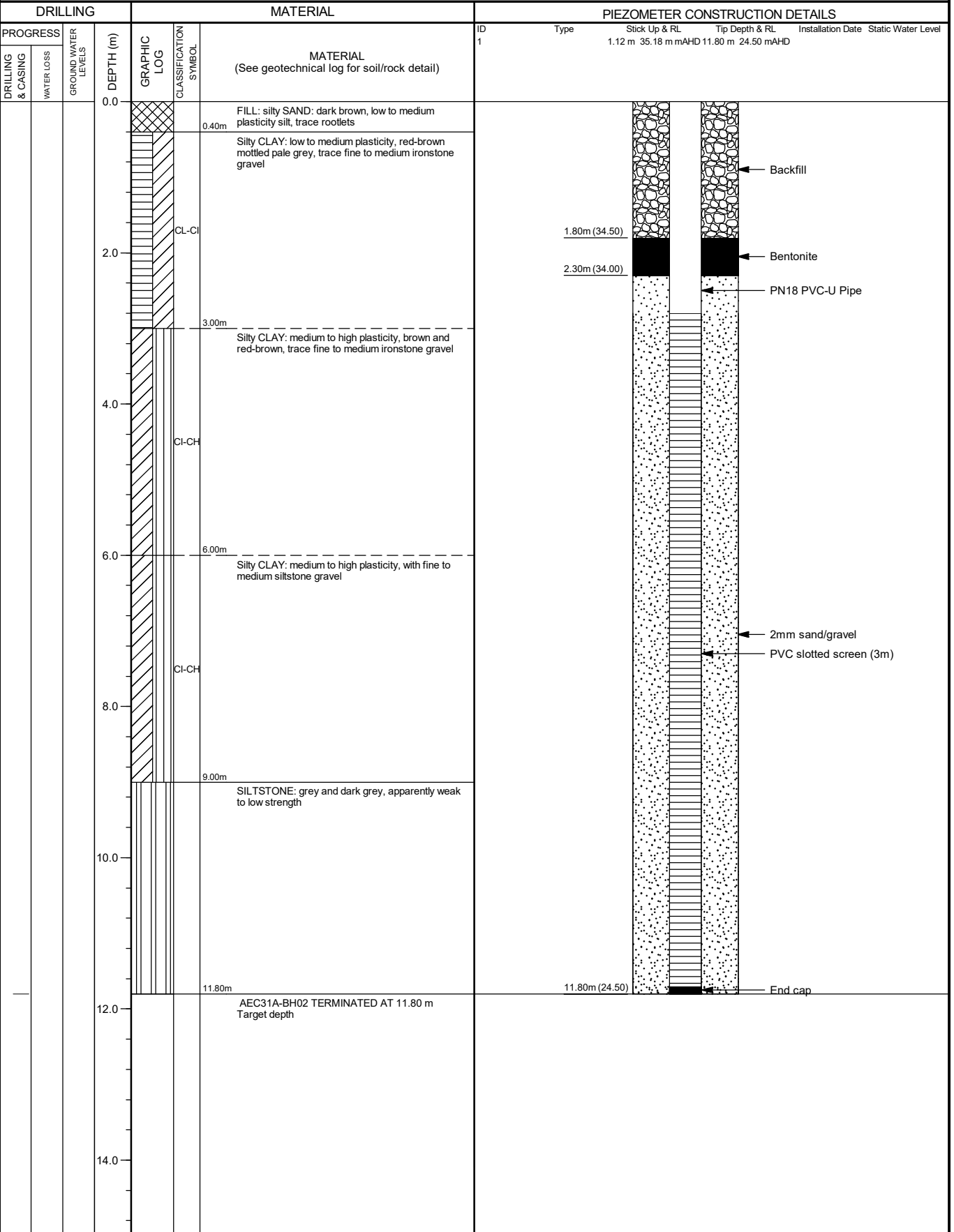
PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291894.8, N: 6258269.1 (56 MGA2020) SURFACE ELEVATION : 36.30 (mAHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HANJIN DB8 MOUNTING : Track CONTRACTOR : Rockwell

DATE STARTED : 02/02/23 DATE COMPLETED : 02/02/23 DATE LOGGED : 02/02/23 LOGGED BY : PJ CHECKED BY : MB



RMS LIB 40.3.14 G.L.B Log RTA PIEZOMETER INSTALLATION LOG 1 AEC\_GROUNDWATER WELLS.GPJ <<DrawingFile>> 17/Feb/2023 15:58 10.02.00.04 Datagel Tools

This report of well/VWP installation must be read in conjunction with accompanying notes and abbreviations. The geotechnical log is a summary only and the detailed log should be referred to for strata details and any core loss zones.

# PIEZOMETER CONSTRUCTION

HOLE NO : AEC31A-BH03

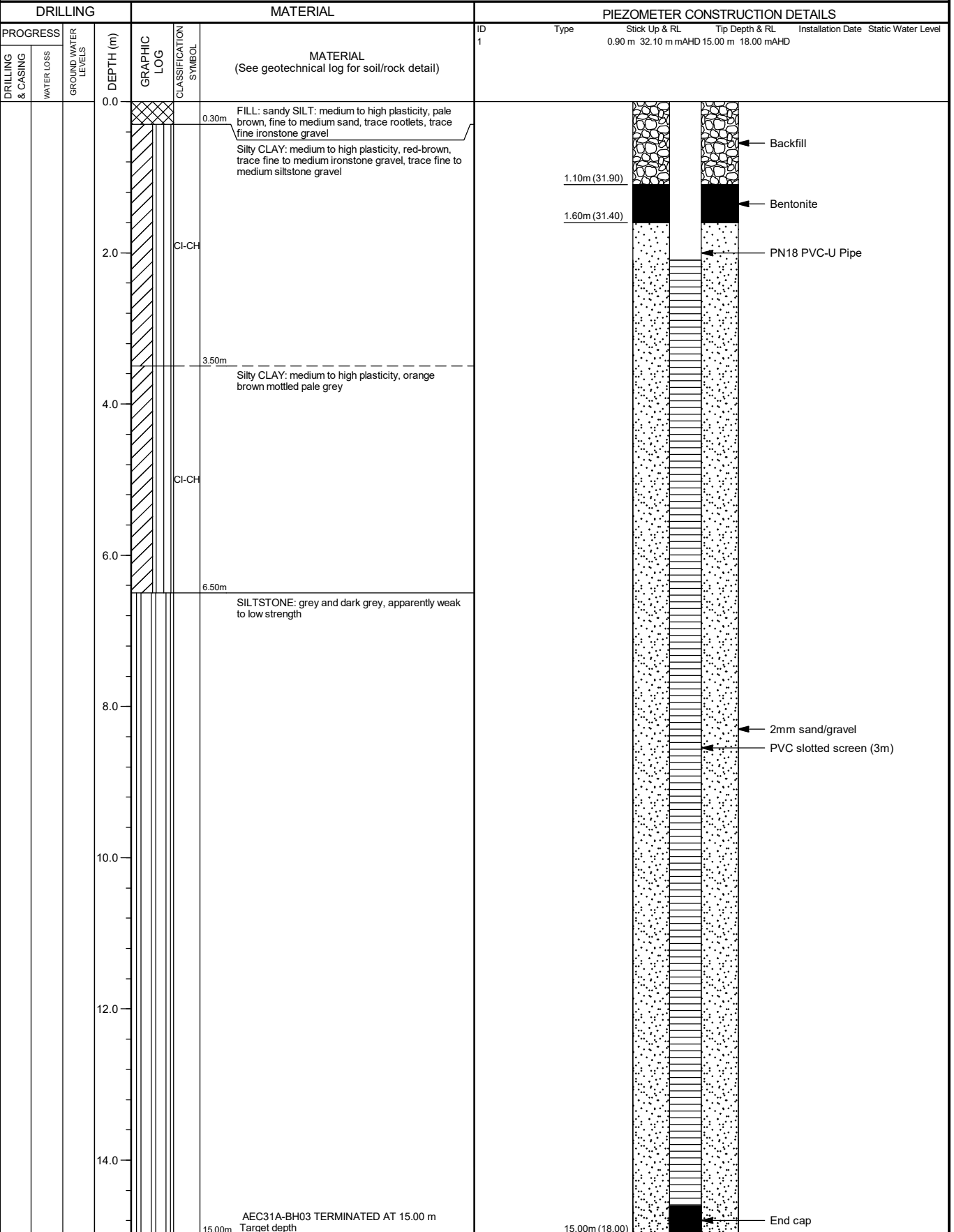
PROJECT : Sydney Metro Western Sydney Airport - Surface and Civil Alignment Works  
LOCATION : Lansdowne Road - Orchard Hills

FILE / JOB NO : 204814.01  
SHEET : 1 OF 1

POSITION : E: 291887.0, N: 6258376.7 (56 MGA2020) SURFACE ELEVATION : 33.00 (mAHD) ANGLE FROM HORIZONTAL : 90°

RIG TYPE : HANJIN DB8 MOUNTING : Track CONTRACTOR : Rockwell

DATE STARTED : 03/02/23 DATE COMPLETED : 03/02/23 DATE LOGGED : 03/02/23 LOGGED BY : PJ CHECKED BY : MB



This report of well/VWP installation must be read in conjunction with accompanying notes and abbreviations. The geotechnical log is a summary only and the detailed log should be referred to for strata details and any core loss zones.



## Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

## Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

## Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

## Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

## Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud 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 the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

## Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

## Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils 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 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm 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 150 mm of, say, 4, 6 and 7 as:  
4,6,7  
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:  
15, 30/40 mm

# *Sampling Methods*

The results of the SPT tests can be related empirically to the engineering properties of the soils.

## **Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests**

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.



### Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

### Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

| Type    | Particle size (mm) |
|---------|--------------------|
| Boulder | >200               |
| Cobble  | 63 - 200           |
| Gravel  | 2.36 - 63          |
| Sand    | 0.075 - 2.36       |
| Silt    | 0.002 - 0.075      |
| Clay    | <0.002             |

The sand and gravel sizes can be further subdivided as follows:

| Type          | Particle size (mm) |
|---------------|--------------------|
| Coarse gravel | 19 - 63            |
| Medium gravel | 6.7 - 19           |
| Fine gravel   | 2.36 - 6.7         |
| Coarse sand   | 0.6 - 2.36         |
| Medium sand   | 0.21 - 0.6         |
| Fine sand     | 0.075 - 0.21       |

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

| Term      | Proportion of sand or gravel | Example                   |
|-----------|------------------------------|---------------------------|
| And       | Specify                      | Clay (60%) and Sand (40%) |
| Adjective | >30%                         | Sandy Clay                |
| With      | 15 - 30%                     | Clay with sand            |
| Trace     | 0 - 15%                      | Clay with trace sand      |

In coarse grained soils (>65% coarse)

- with clays or silts

| Term      | Proportion of fines | Example                   |
|-----------|---------------------|---------------------------|
| And       | Specify             | Sand (70%) and Clay (30%) |
| Adjective | >12%                | Clayey Sand               |
| With      | 5 - 12%             | Sand with clay            |
| Trace     | 0 - 5%              | Sand with trace clay      |

In coarse grained soils (>65% coarse)

- with coarser fraction

| Term      | Proportion of coarser fraction | Example                     |
|-----------|--------------------------------|-----------------------------|
| And       | Specify                        | Sand (60%) and Gravel (40%) |
| Adjective | >30%                           | Gravelly Sand               |
| With      | 15 - 30%                       | Sand with gravel            |
| Trace     | 0 - 15%                        | Sand with trace gravel      |

The presence of cobbles and boulders shall be specifically noted by beginning the description with 'Mix of Soil and Cobbles/Boulders' with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

# Soil Descriptions

## Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

| Description | Abbreviation | Undrained shear strength (kPa) |
|-------------|--------------|--------------------------------|
| Very soft   | VS           | <12                            |
| Soft        | S            | 12 - 25                        |
| Firm        | F            | 25 - 50                        |
| Stiff       | St           | 50 - 100                       |
| Very stiff  | VSt          | 100 - 200                      |
| Hard        | H            | >200                           |
| Friable     | Fr           | -                              |

## Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

| Relative Density | Abbreviation | Density Index (%) |
|------------------|--------------|-------------------|
| Very loose       | VL           | <15               |
| Loose            | L            | 15-35             |
| Medium dense     | MD           | 35-65             |
| Dense            | D            | 65-85             |
| Very dense       | VD           | >85               |

## Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;

- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

## Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.  
Soil tends to stick together.  
Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.  
Soil tends to stick together, free water forms when handling.

## Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w < PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL' (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w > PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈ LL' (i.e. near the liquid limit).
- 'Wet' or 'w > LL' (i.e. wet of the liquid limit).



## Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index  $IS_{(50)}$  is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

| Strength Term  | Abbreviation | Unconfined Compressive Strength MPa | Point Load Index * $IS_{(50)}$ MPa |
|----------------|--------------|-------------------------------------|------------------------------------|
| Very low       | VL           | 0.6 - 2                             | 0.03 - 0.1                         |
| Low            | L            | 2 - 6                               | 0.1 - 0.3                          |
| Medium         | M            | 6 - 20                              | 0.3 - 1.0                          |
| High           | H            | 20 - 60                             | 1 - 3                              |
| Very high      | VH           | 60 - 200                            | 3 - 10                             |
| Extremely high | EH           | >200                                | >10                                |

\* Assumes a ratio of 20:1 for UCS to  $IS_{(50)}$ . It should be noted that the UCS to  $IS_{(50)}$  ratio varies significantly for different rock types and specific ratios should be determined for each site.

## Degree of Weathering

The degree of weathering of rock is classified as follows:

| Term                                                                  | Abbreviation | Description                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Residual Soil                                                         | RS           | Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.                                                                                                                                                                        |
| Extremely weathered                                                   | XW           | Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible                                                                                                                                                                                                                                  |
| Highly weathered                                                      | HW           | The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores. |
| Moderately weathered                                                  | MW           | The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.                                                                                                                                                                 |
| Slightly weathered                                                    | SW           | Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.                                                                                                                                                                                                                                                        |
| Fresh                                                                 | FR           | No signs of decomposition or staining.                                                                                                                                                                                                                                                                                                                                                  |
| <i>Note: If HW and MW cannot be differentiated use DW (see below)</i> |              |                                                                                                                                                                                                                                                                                                                                                                                         |
| Distinctly weathered                                                  | DW           | Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.                                                                                                                                                                  |

# Rock Descriptions

## Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

| Term               | Description                                                             |
|--------------------|-------------------------------------------------------------------------|
| Fragmented         | Fragments of <20 mm                                                     |
| Highly Fractured   | Core lengths of 20-40 mm with occasional fragments                      |
| Fractured          | Core lengths of 30-100 mm with occasional shorter and longer sections   |
| Slightly Fractured | Core lengths of 300 mm or longer with occasional sections of 100-300 mm |
| Unbroken           | Core contains very few fractures                                        |

## Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

## Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

| Term                | Separation of Stratification Planes |
|---------------------|-------------------------------------|
| Thinly laminated    | < 6 mm                              |
| Laminated           | 6 mm to 20 mm                       |
| Very thinly bedded  | 20 mm to 60 mm                      |
| Thinly bedded       | 60 mm to 0.2 m                      |
| Medium bedded       | 0.2 m to 0.6 m                      |
| Thickly bedded      | 0.6 m to 2 m                        |
| Very thickly bedded | > 2 m                               |

# Symbols & Abbreviations

## Douglas Partners



### Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

### Drilling or Excavation Methods

|      |                          |
|------|--------------------------|
| C    | Core drilling            |
| R    | Rotary drilling          |
| SFA  | Spiral flight augers     |
| NMLC | Diamond core - 52 mm dia |
| NQ   | Diamond core - 47 mm dia |
| HQ   | Diamond core - 63 mm dia |
| PQ   | Diamond core - 81 mm dia |

### Water

|   |             |
|---|-------------|
| ▷ | Water seep  |
| ▽ | Water level |

### Sampling and Testing

|                 |                                |
|-----------------|--------------------------------|
| A               | Auger sample                   |
| B               | Bulk sample                    |
| D               | Disturbed sample               |
| E               | Environmental sample           |
| U <sub>50</sub> | Undisturbed tube sample (50mm) |
| W               | Water sample                   |
| pp              | Pocket penetrometer (kPa)      |
| PID             | Photo ionisation detector      |
| PL              | Point load strength Is(50) MPa |
| S               | Standard Penetration Test      |
| V               | Shear vane (kPa)               |

### Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

### Defect Type

|     |                 |
|-----|-----------------|
| B   | Bedding plane   |
| Cs  | Clay seam       |
| Cv  | Cleavage        |
| Cz  | Crushed zone    |
| Ds  | Decomposed seam |
| F   | Fault           |
| J   | Joint           |
| Lam | Lamination      |
| Pt  | Parting         |
| Sz  | Sheared Zone    |
| V   | Vein            |

### Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

|    |                |
|----|----------------|
| h  | horizontal     |
| v  | vertical       |
| sh | sub-horizontal |
| sv | sub-vertical   |

### Coating or Infilling Term

|     |          |
|-----|----------|
| cln | clean    |
| co  | coating  |
| he  | healed   |
| inf | infilled |
| stn | stained  |
| ti  | tight    |
| vn  | veneer   |

### Coating Descriptor

|     |              |
|-----|--------------|
| ca  | calcite      |
| cbs | carbonaceous |
| cly | clay         |
| fe  | iron oxide   |
| mn  | manganese    |
| slt | silty        |

### Shape

|    |            |
|----|------------|
| cu | curved     |
| ir | irregular  |
| pl | planar     |
| st | stepped    |
| un | undulating |

### Roughness

|    |              |
|----|--------------|
| po | polished     |
| ro | rough        |
| sl | slickensided |
| sm | smooth       |
| vr | very rough   |

### Other

|     |            |
|-----|------------|
| fg  | fragmented |
| bnd | band       |
| qtz | quartz     |

# Symbols & Abbreviations

## Graphic Symbols for Soil and Rock

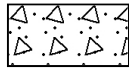
### General



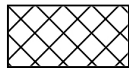
Asphalt



Road base



Concrete

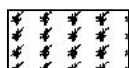


Filling

### Soils



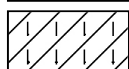
Topsoil



Peat



Clay



Silty clay



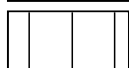
Sandy clay



Gravelly clay



Shaly clay



Silt



Clayey silt



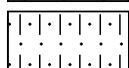
Sandy silt



Sand



Clayey sand



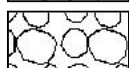
Silty sand



Gravel



Sandy gravel



Cobbles, boulders



Talus

### Sedimentary Rocks



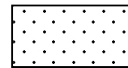
Boulder conglomerate



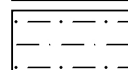
Conglomerate



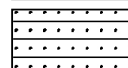
Conglomeratic sandstone



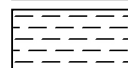
Sandstone



Siltstone



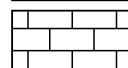
Laminite



Mudstone, claystone, shale

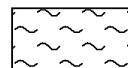


Coal

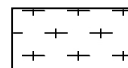


Limestone

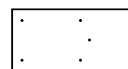
### Metamorphic Rocks



Slate, phyllite, schist

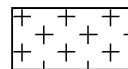


Gneiss

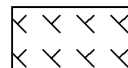


Quartzite

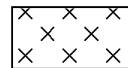
### Igneous Rocks



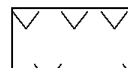
Granite



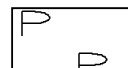
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

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## Appendix H

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Field Sheets and Calibration Certificates

| Groundwater Field Sheet                            |                                                         |              |                  |         |           |            |
|----------------------------------------------------|---------------------------------------------------------|--------------|------------------|---------|-----------|------------|
| Project and Bore Installation Details              |                                                         |              |                  |         |           |            |
| Bore / Standpipe ID:                               | AP/31A6H01                                              |              |                  |         |           |            |
| Project Name:                                      | SAU                                                     |              |                  |         |           |            |
| Project Number:                                    | 204814-01                                               |              |                  |         |           |            |
| Site Location:                                     |                                                         |              |                  |         |           |            |
| Bore GPS Co-ord:                                   |                                                         |              |                  |         |           |            |
| Installation Date:                                 |                                                         |              |                  |         |           |            |
| GW Level (during drilling):                        | m bgl                                                   |              |                  |         |           |            |
| Well Depth:                                        | m bgl                                                   |              |                  |         |           |            |
| Screened Interval:                                 | m bgl                                                   |              |                  |         |           |            |
| Contaminants/Comments:                             |                                                         |              |                  |         |           |            |
| Bore Development Details                           |                                                         |              |                  |         |           |            |
| Date/Time:                                         | 6/12/23                                                 |              |                  |         |           |            |
| Purged By:                                         | PS                                                      |              |                  |         |           |            |
| GW Level (pre-purge):                              | 2.56 m bgl                                              |              |                  |         |           |            |
| Observed Well Depth:                               | 14.18 m bgl                                             |              |                  |         |           |            |
| PSH observed:                                      | Yes / (No) (interface / visual). Thickness if observed: |              |                  |         |           |            |
| Estimated Bore Volume:                             | 23 L                                                    |              |                  |         |           |            |
| Total Volume Purged:                               | 32 L (target: no drill mud, min 3 well vol. or dry)     |              |                  |         |           |            |
| GW Level (post-purge):                             | 11.4 m bgl                                              |              |                  |         |           |            |
| Equipment:                                         | Twister Pump.                                           |              |                  |         |           |            |
| Micropurge and Sampling Details                    |                                                         |              |                  |         |           |            |
| Date/Time:                                         | 13/12/23                                                |              |                  |         |           |            |
| Sampled By:                                        | PS                                                      |              |                  |         |           |            |
| Weather Conditions:                                | cloudy                                                  |              |                  |         |           |            |
| GW Level (pre-purge):                              | 9.33 m bgl                                              |              |                  |         |           |            |
| Observed Well Depth:                               | 14.18 m bgl                                             |              |                  |         |           |            |
| PSH observed:                                      | Yes / (No) (interface / visual). Thickness if observed: |              |                  |         |           |            |
| Estimated Bore Volume:                             | 10 L                                                    |              |                  |         |           |            |
| GW Level (post sample):                            | 12.31 m bgl                                             |              |                  |         |           |            |
| Total Volume Purged:                               | 8.9 L                                                   |              |                  |         |           |            |
| Equipment:                                         | Pevi Pump                                               |              |                  |         |           |            |
| Water Quality Parameters                           |                                                         |              |                  |         |           |            |
| Time / Volume                                      | Temp (°C)                                               | DO (mg/L)    | EC (µS or mS/cm) | pH      | Turbidity | Redox (mV) |
| Stabilisation Criteria (3 readings)                | 0.1 °C                                                  | +/- 0.3 mg/L | +/- 3%           | +/- 0.1 | +/- 10%   | +/- 10 mV  |
|                                                    | 22.9                                                    | 8.30         | 18247            | 6.50    |           | 140.6      |
|                                                    | 22.8                                                    | 8.25         | 17674            | 6.45    |           | 140.0      |
|                                                    | 22.5                                                    | 8.20         | 16899            | 6.43    |           | 139.4      |
|                                                    | 22.1                                                    | 8.60         | 16814            | 6.43    |           | 134.2      |
|                                                    | 22.1                                                    | 7.56         | 16619            | 6.42    |           | 131.0      |
|                                                    | 22.1                                                    | 7.56         | 16620            | 6.43    |           | 130.6      |
| Additional Readings Following stabilisation:       |                                                         |              |                  |         |           |            |
|                                                    | DO % Sat                                                | SPC          | TDS              |         |           |            |
|                                                    | 92.1                                                    | 12.155       | 7888             |         |           |            |
| Sample Details                                     |                                                         |              |                  |         |           |            |
| Sampling Depth (rationale):                        | 12 m bgl, mid screen                                    |              |                  |         |           |            |
| Sample Appearance (e.g. colour, siltiness, odour): | Cloudy, pale brown, moderate turbidity, no colour       |              |                  |         |           |            |
| Sample ID:                                         | AP/31A6H01                                              |              |                  |         |           |            |
| QA/QC Samples:                                     | BD1   20230213                                          |              |                  |         |           |            |
| Sampling Containers and filtration:                |                                                         |              |                  |         |           |            |
| Comments / Observations:                           | Development / Brown, cloudy, high turbidity, no odour   |              |                  |         |           |            |

### Groundwater Field Sheet

#### Project and Bore Installation Details

|                             |            |
|-----------------------------|------------|
| Bore / Standpipe ID:        | APL3/ABH02 |
| Project Name:               | SAW        |
| Project Number:             | 20481401   |
| Site Location:              |            |
| Bore GPS Co-ord:            |            |
| Installation Date:          |            |
| GW Level (during drilling): | m bgl      |
| Well Depth:                 | m bgl      |
| Screened Interval:          | m bgl      |
| Contaminants/Comments:      |            |

#### Bore Development Details

|                        |                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------|
| Date/Time:             | 6/2/23                                                                                      |
| Purged By:             | PJ                                                                                          |
| GW Level (pre-purge):  | 6.33 m bgl                                                                                  |
| Observed Well Depth:   | 11.83 m bgl                                                                                 |
| PSH observed:          | Yes / No / <input checked="" type="checkbox"/> interface / visual ). Thickness if observed: |
| Estimated Bore Volume: | 11 L                                                                                        |
| Total Volume Purged:   | 406 (target: no drill mud, min 3 well vol. or dry)                                          |
| GW Level (post-purge): | DRY m bgl                                                                                   |
| Equipment:             | Twister Pump                                                                                |

#### Micropurge and Sampling Details

|                         |                                                                                             |
|-------------------------|---------------------------------------------------------------------------------------------|
| Date/Time:              | 6/2/23 13/2/23                                                                              |
| Sampled By:             | PJ                                                                                          |
| Weather Conditions:     | Cloudy, sunny                                                                               |
| GW Level (pre-purge):   | 7.25 m bgl                                                                                  |
| Observed Well Depth:    | 11.83 m bgl                                                                                 |
| PSH observed:           | Yes / No / <input checked="" type="checkbox"/> interface / visual ). Thickness if observed: |
| Estimated Bore Volume:  | 9 L                                                                                         |
| GW Level (post sample): | 11.50 m bgl                                                                                 |
| Total Volume Purged:    | 10 L                                                                                        |
| Equipment:              | Peri Pump                                                                                   |

#### Water Quality Parameters

| Time / Volume                                       | Temp (°C) | DO (mg/L)    | EC (µS or mS/cm) | pH      | Turbidity | Redox (mV) |
|-----------------------------------------------------|-----------|--------------|------------------|---------|-----------|------------|
| <b>Stabilisation Criteria (3 readings)</b>          |           |              |                  |         |           |            |
|                                                     | 0.1°C     | +/- 0.3 mg/L | +/- 3%           | +/- 0.1 | +/- 10%   | +/- 10 mV  |
|                                                     | 28.8      | 3.45         | 34024            | 5.62    |           | 137.3      |
|                                                     | 19.5      | 3.06         | 33492            | 5.57    |           | 146.2      |
|                                                     | 19.2      | 2.76         | 33334            | 5.54    |           | 154.2      |
|                                                     | 19.1      | 2.66         | 33228            | 5.57    |           | 160.2      |
|                                                     | 19.0      | 2.60         | 33134            | 5.47    |           | 160.9      |
|                                                     | 19.0      | 2.60         | 33126            | 5.47    |           | 161.2      |
|                                                     | 19.0      | 2.60         | 33120            | 5.47    |           | 160.8      |
| <b>Additional Readings Following stabilisation:</b> |           |              |                  |         |           |            |
|                                                     | DO % Sat  | SPC          | TDS              |         |           |            |
|                                                     | 32.7      | 25400        | 16521            |         |           |            |

#### Sample Details

|                                                    |                                                             |
|----------------------------------------------------|-------------------------------------------------------------|
| Sampling Depth (rationale):                        | 10 m bgl, mid screen                                        |
| Sample Appearance (e.g. colour, siltiness, odour): | Cloudy, pale brown, low turbidity, no odour                 |
| Sample ID:                                         | APL3/ABH02                                                  |
| QA/QC Samples:                                     | B02/20230213                                                |
| Sampling Containers and filtration:                |                                                             |
| Comments / Observations:                           | Development: Brown, silty, cloudy, high turbidity, no odour |

# Groundwater Field Sheet

## Project and Bore Installation Details

|                             |             |
|-----------------------------|-------------|
| Bore / Standpipe ID:        | HEL314 BH03 |
| Project Name:               | SCALW       |
| Project Number:             | 20181401    |
| Site Location:              |             |
| Bore GPS Co-ord:            |             |
| Installation Date:          |             |
| GW Level (during drilling): | m bgl       |
| Well Depth:                 | m bgl       |
| Screened Interval:          | m bgl       |
| Contaminants/Comments:      |             |

## Bore Development Details

|                        |                                                       |
|------------------------|-------------------------------------------------------|
| Date/Time:             | 7/12/23                                               |
| Purged By:             |                                                       |
| GW Level (pre-purge):  | 1.38 m bgl                                            |
| Observed Well Depth:   | 14.13 m bgl                                           |
| PSH observed:          | Yes / No (interface / visual). Thickness if observed: |
| Estimated Bore Volume: | 26 L                                                  |
| Total Volume Purged:   | 5.50 L (target: no drill mud, min 3 well vol. or dry) |
| GW Level (post-purge): | DRY m bgl                                             |
| Equipment:             | Twister Pump                                          |

## Micropurge and Sampling Details

|                         |                                                       |
|-------------------------|-------------------------------------------------------|
| Date/Time:              | 13/12/23                                              |
| Sampled By:             | PJ                                                    |
| Weather Conditions:     | Cloudy                                                |
| GW Level (pre-purge):   | 3.87 m bgl                                            |
| Observed Well Depth:    | 14.13 m bgl                                           |
| PSH observed:           | Yes / No (interface / visual). Thickness if observed: |
| Estimated Bore Volume:  | 20 L                                                  |
| GW Level (post sample): | 5.50 m bgl                                            |
| Total Volume Purged:    | 6 L                                                   |
| Equipment:              | Pewi Pump                                             |

## Water Quality Parameters

| Time / Volume                       | Temp (°C) | DO (mg/L)    | EC (µS or mS/cm) | pH      | Turbidity | Redox (mV) |
|-------------------------------------|-----------|--------------|------------------|---------|-----------|------------|
| Stabilisation Criteria (3 readings) | 0.1 °C    | +/- 0.3 mg/L | +/- 3%           | +/- 0.1 | +/- 10%   | +/- 10 mV  |
|                                     | 17.7      | 6.45         | 20745            | 7.07    |           | 125.0      |
|                                     | 17.4      | 6.15         | 20484            | 6.99    |           | 131.8      |
|                                     | 17.3      | 5.92         | 20418            | 6.96    |           | 134.9      |
|                                     | 17.3      | 5.85         | 20395            | 6.95    |           | 137.1      |
|                                     | 17.2      | 5.89         | 20281            | 6.95    |           | 139.3      |
|                                     | 17.3      | 5.79         | 20379            | 6.95    |           | 140.7      |
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| </                                  |           |              |                  |         |           |            |

## Sample Details

|                                                    |                                                             |
|----------------------------------------------------|-------------------------------------------------------------|
| Sampling Depth (rationale):                        | 10 m bgl, Mid screen                                        |
| Sample Appearance (e.g. colour, siltiness, odour): | Clear / transparent, cloudy, low turbidity, no odour        |
| Sample ID:                                         | HEL314BH03                                                  |
| QA/QC Samples:                                     |                                                             |
| Sampling Containers and filtration:                |                                                             |
| Comments / Observations:                           | Development: Brown, silty, high turbidity; no odour, cloudy |

## RECORD OF ASBESTOS SAMPLES

|                                                                                          |                                  |
|------------------------------------------------------------------------------------------|----------------------------------|
| <b>Project:</b> WSA SCAW Tender Design                                                   | <b>Project Number:</b> 204814.01 |
| <b>Client:</b> CPB Contractors Pty Limited & United Infrastructure Pty Limited (CPBUIJV) | <b>Date:</b>                     |
| <b>Location:</b> Elizabeth Drive, Luddenham                                              | <b>Field Staff:</b>              |

[illegible]

|                                                                                          |                              |
|------------------------------------------------------------------------------------------|------------------------------|
| <b>Project:</b> WSA SCAW Tender Design                                                   | <b>Project No:</b> 204814.01 |
| <b>Client:</b> CPB Contractors Pty Limited & United Infrastructure Pty Limited (CPBUIJV) |                              |
| <b>Location:</b> Elizabeth Drive, Luddenham                                              |                              |
| <b>Sampling Method:</b> <i>Bailer</i>                                                    |                              |

|                                  |                    |                      |           |                   |  |  |
|----------------------------------|--------------------|----------------------|-----------|-------------------|--|--|
| Sample ID:                       | AE631ASW1          | AE631ASW2            | AE631ASW3 | AE631ASW4         |  |  |
| Sampling Date                    | 24/1/23            | 24/1/23              | 24/1/23   | 24/1/23           |  |  |
| Time of Sampling                 |                    |                      |           |                   |  |  |
| Temperature (°C)                 | 24.1               | 21.6                 | 24.2      | 21.2              |  |  |
| pH (record to one decimal place) | 6.6                | 6.3                  | 8.3       | 6.5               |  |  |
| EC (µS/cm)                       | 316.3              | 426.3                | 1114      | 2582              |  |  |
| Dissolved Oxygen (% Sat)         | 3.0                | 8.0                  | 80.0      | 3.0               |  |  |
| Dissolved Oxygen (mg/L)          | 0.2                | 0.7                  | 6.7       | 0.3               |  |  |
| Turbidity (NTU)                  | Moderate           | Moderate             | Low       | Nil               |  |  |
| Redox (mV)                       | -65.2              | -100.5               | 734.5     | 67.9              |  |  |
| TDS (mg/L)                       | 208.0              | 297.05               | 59.1      | 183.5             |  |  |
| Odour                            | No                 | <del>No</del> Slight | No        | No                |  |  |
| Colour                           | Brown              | Dark Brown           | Brown     | Clear transparent |  |  |
| Observations                     | Silty<br>Algae/red | Silty<br>Algae/green |           |                   |  |  |
| <b>Notes:</b>                    |                    |                      |           |                   |  |  |
| Supervisor: <i>PJ</i>            |                    |                      |           |                   |  |  |
| Date: <i>24/1/23</i>             |                    |                      |           |                   |  |  |

Water quality meter calibration details (please tick calibration liquids used):

| Meter ID         |                          |             |  |                                         |                          |             |  |
|------------------|--------------------------|-------------|--|-----------------------------------------|--------------------------|-------------|--|
| Buffer (pH 4)    | <input type="checkbox"/> | Use-by Date |  | Conductivity Standard (2.76 mS/cm)      | <input type="checkbox"/> | Use-by Date |  |
| Buffer (pH 6.88) | <input type="checkbox"/> | Use-by Date |  | Total Dissolved Solids Standard (2 ppk) | <input type="checkbox"/> | Use-by Date |  |
| Buffer (pH 9)    | <input type="checkbox"/> | Use-by Date |  | Rapid Cal Solution                      | <input type="checkbox"/> | Use-by Date |  |

## PID Calibration Certificate

Instrument      PhoCheck Tiger  
 Serial No.      T-108801



Air-Met Scientific Pty Ltd  
 1300 137 067

| Item          | Test                 | Pass | Comments |        |     |      |
|---------------|----------------------|------|----------|--------|-----|------|
| Battery       | Charge Condition     | ✓    |          |        |     |      |
|               | Fuses                | ✓    |          |        |     |      |
|               | Capacity             | ✓    |          |        |     |      |
|               | Recharge OK?         | ✓    |          |        |     |      |
| Switch/keypad | Operation            | ✓    |          |        |     |      |
| Display       | Intensity            | ✓    |          |        |     |      |
|               | Operation (segments) | ✓    |          |        |     |      |
| Grill Filter  | Condition            | ✓    |          |        |     |      |
|               | Seal                 | ✓    |          |        |     |      |
| Pump          | Operation            | ✓    |          |        |     |      |
|               | Filter               | ✓    |          |        |     |      |
|               | Flow                 | ✓    |          |        |     |      |
|               | Valves, Diaphragm    | ✓    |          |        |     |      |
| PCB           | Condition            | ✓    |          |        |     |      |
| Connectors    | Condition            | ✓    |          |        |     |      |
| Sensor        | PID                  | ✓    | 10.6 ev  |        |     |      |
| Alarms        | Beeper               | ✓    | Low      | High   | TWA | STEL |
|               | Settings             | ✓    | 50ppm    | 100ppm |     |      |
| Software      | Version              | ✓    |          |        |     |      |
| Data logger   | Operation            | ✓    |          |        |     |      |
| Download      | Operation            | ✓    |          |        |     |      |
| Other tests:  |                      |      |          |        |     |      |

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

| Sensor   | Serial no | Calibration gas and concentration | Certified | Gas bottle No |  | Instrument Reading |
|----------|-----------|-----------------------------------|-----------|---------------|--|--------------------|
| PID Lamp |           | 94ppm Isobutylene                 | NATA      | SY506         |  | 94.3ppm            |

Calibrated by: \_\_\_\_\_ Alex Buist

Calibration date: 4/11/2022

Next calibration due: 6/05/2023

## Soil Description -

- AEL31A SED1 - FILL/Sandy SILT, m-lp, dark brown, sand f-m, t/rootlets, ~~well~~  
w/ PL
- AEL31A SED2 - " "
- AEL31A SED3 - " "
- AEL31A SED4 - FILL/Sandy Gravel, f-m, brown and pale brown, well  
rounded - rounded, t/rootlets, sand f-c, moist
- AEL38 SP1 - FILL/Silty SAND, f-c, silt l-mp, brown to pale brown  
f/ss gravel f-c, rootlets, dry
- AEL38 SP2 - FILL/Silty SAND, f-c silt l-mp, brown to pale brown  
with some ~~red~~ dark brown, w/ss gravel f-c, t/rootlets  
metal flag pole, dry
- AEL38 SS1 - FILL/Silty SAND, f-m, pale brown, t/rootlets, fine  
gravel, dry
- AEL38 SS2 - " "

## Multi Parameter Water Meter

Instrument **YSI Pro DSS**  
Serial No. **21K104037**



Air-Met Scientific Pty Ltd  
1300 137 067

| Item          | Test                 | Pass | Comments |
|---------------|----------------------|------|----------|
| Battery       | Charge Condition     | ✓    |          |
|               | Fuses                | ✓    |          |
|               | Capacity             | ✓    |          |
|               | Recharge OK?         | ✓    |          |
| Switch/keypad | Operation            | ✓    |          |
| Display       | Intensity            | ✓    |          |
|               | Operation (segments) | ✓    |          |
| Grill Filter  | Condition            | ✓    |          |
|               | Seal                 | ✓    |          |
| PCB           | Condition            | ✓    |          |
| Connectors    | Condition            | ✓    |          |
| Sensor        | 1. pH/ORP            | ✓    |          |
|               | 2. Turbidity         | ✓    |          |
|               | 3. Conductivity      | ✓    |          |
|               | 4. D.O               | ✓    |          |
|               | 5. Temp              | ✓    |          |
|               | 6. Depth             | ✓    |          |
| Alarms        | Beeper               |      |          |
|               | Settings             |      |          |
| Software      | Version              |      |          |
| Data logger   | Operation            |      |          |
| Download      | Operation            |      |          |
| Other tests:  |                      |      |          |

### Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

| Sensor       | Serial no | Standard Solutions | Certified | Solution Bottle Number | Instrument Reading |
|--------------|-----------|--------------------|-----------|------------------------|--------------------|
| 1. EC        |           | 2.76mS             |           | 396172                 | 2.763mS            |
| 2. Temp      |           | 22.7°C             |           | Instrument temp        | 23.0°C             |
| 3. pH 4      |           | pH 4.00            |           | 399527                 | pH 4.03            |
| 4. pH 7      |           | pH 7.00            |           | 386467                 | pH 6.98            |
| 5. DO        |           | 0%                 |           | 396172                 | 0.4%               |
| 6. Turbidity |           | 100 NTU            |           | 396421                 | 100.43 NTU         |
| 7. mV        |           | 234.72mV           |           | 395557/395763          | 234.8mV            |

Calibrated by: Lebelle Chee

Calibration date: **30/01/2023**

Next calibration due: **1/03/2023**

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## Appendix I

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### Summary of Analytical Results

Table I1: Summary of Laboratory Results for Soil – Metals, TRH, BTEX, PAH

|                           |             |             |             | Metals  |         |                |        |       |                     |        |       | Total Recoverable Hydrocarbons |              |                      |                               |              |              | BTEX    |         |              |               | PAH                      |                     |                   |            |      |      |      |       |      |      |      |      |      |
|---------------------------|-------------|-------------|-------------|---------|---------|----------------|--------|-------|---------------------|--------|-------|--------------------------------|--------------|----------------------|-------------------------------|--------------|--------------|---------|---------|--------------|---------------|--------------------------|---------------------|-------------------|------------|------|------|------|-------|------|------|------|------|------|
|                           |             |             |             | Arsenic | Cadmium | Total Chromium | Copper | Lead  | Mercury (inorganic) | Nickel | Zinc  | TRH C6 - C10                   | TRH >C10-C16 | TRH C6-C10 less BTEX | TRH >C10-C16 less Naphthalene | TRH >C16-C34 | TRH >C34-C40 | Benzene | Toluene | Ethylbenzene | Total Xylenes | Naphthalene <sup>b</sup> | Benzofluorene (BaP) | Benzofluorene TEQ | Total PAHs |      |      |      |       |      |      |      |      |      |
| Sample ID                 | Depth       | Sample Type | Sample Date | mg/kg   | mg/kg   | mg/kg          | mg/kg  | mg/kg | mg/kg               | mg/kg  | mg/kg | mg/kg                          | mg/kg        | mg/kg                | mg/kg                         | mg/kg        | mg/kg        | mg/kg   | mg/kg   | mg/kg        | mg/kg         | mg/kg                    | mg/kg               | mg/kg             | mg/kg      |      |      |      |       |      |      |      |      |      |
| AEC31ATP01                | 0 - 0.05 m  | Fill        | 8/12/22     | 6       | <0.4    | 12             | 12     | 6     | <0.1                | 4      | 47    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.05      |      |      |      |       |      |      |      |      |      |
| AEC31ATP01 - (TRIPLICATE) | 0 - 0.05 m  | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 9       | <0.4    | 19             | 19     | 15    | <0.1                | 7      | 42    | -                              | -            | -                    | -                             | 120          | 260          | 180     | NL      | -            | -             | -                        | -                   | -                 | -          | 230  | 105  | NL   | 170   | -    | 0.7  | 3    | -    | 300  |
| AEC31ATP01                | 0.1 - 0.2 m | Natural     | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 9       | <0.4    | 21             | 18     | 16    | <0.1                | 2      | 11    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP02                | 0 - 0.05 m  | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 4       | 65           | NL            | 105                      | NL                  | 125               | NL         | 45   | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 9       | <0.4    | 35             | 32     | 24    | <0.1                | 7      | 120   | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP03                | 0 - 0.05 m  | Fill        | 9/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 8       | <0.4    | 28             | 9      | 20    | <0.1                | 5      | 20    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP04                | 0 - 0.1 m   | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 4       | 65           | NL            | 105                      | NL                  | 125               | NL         | 45   | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 6       | <0.4    | 25             | 8      | 15    | <0.1                | 3      | 11    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP05                | 0 - 0.1 m   | Fill        | 9/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 6       | <0.4    | 22             | 6      | 13    | <0.1                | 2      | 15    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| BD1/20221209              | 0 - 0.1 m   | Fill        | 9/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 6       | <0.4    | 25             | 4      | 13    | <0.1                | 2      | 17    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP06                | 0 - 0.1 m   | Fill        | 9/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 7       | <0.4    | 20             | 39     | 18    | <0.1                | 4      | 54    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP07                | 0 - 0.1 m   | Fill        | 9/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 6       | <0.4    | 29             | 22     | 15    | <0.1                | 3      | 33    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP08                | 0 - 0.1 m   | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 5       | <0.4    | 22             | 7      | 15    | <0.1                | 3      | 8     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP09                | 0 - 0.1 m   | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 5       | <0.4    | 14             | 7      | 13    | <0.1                | 2      | 8     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| BD4/20221208              | 0 - 0.1 m   | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 6       | <0.4    | 17             | 10     | 15    | <0.1                | 2      | 12    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| AEC31ATP10                | 0 - 0.1 m   | Fill        | 8/12/22     | 300     | 100     | 90             | 190    | 17000 | 210                 | 600    | 1100  | 80                             | 1200         | 170                  | 30000                         | 480          | -            | -       | 3       | 50           | NL            | 85                       | NL                  | 70                | 230        | 105  | NL   | 170  | -     | 0.7  | 3    | -    | 300  | -    |
|                           |             |             |             | 7       | <0.4    | 43             | 6      | 19    | <0.1                | 3      | 13    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05               | <0.5              | <0.5       | <0.5 | <0.5 | <0.1 | <0.05 | &    |      |      |      |      |

Table I1: Summary of Laboratory Results for Soil – Metals, TRH, BTEX, PAH

|              |             |             |             | Metals     |         |                   |        |       |                     |        |       | Total Recoverable Hydrocarbons |              |                      |                               |              |              |         | BTEx    |              |               |                          | PAH                  |                    |            |  |
|--------------|-------------|-------------|-------------|------------|---------|-------------------|--------|-------|---------------------|--------|-------|--------------------------------|--------------|----------------------|-------------------------------|--------------|--------------|---------|---------|--------------|---------------|--------------------------|----------------------|--------------------|------------|--|
|              |             |             |             | Arsenic    | Cadmium | Total Chromium    | Copper | Lead  | Mercury (inorganic) | Nickel | Zinc  | TRH C6 - C10                   | TRH >C10-C16 | TRH C6-C10 less BTEx | TRH >C10-C16 less Naphthalene | TRH >C16-C34 | TRH >C34-C40 | Benzene | Toluene | Ethylbenzene | Total Xylenes | Naphthalene <sup>b</sup> | Benzo(a)pyrene (BaP) | Benzo(a)pyrene TEQ | Total PAHs |  |
| Sample ID    | Depth       | Sample Type | Sample Date | mg/kg      | mg/kg   | mg/kg             | mg/kg  | mg/kg | mg/kg               | mg/kg  | mg/kg | mg/kg                          | mg/kg        | mg/kg                | mg/kg                         | mg/kg        | mg/kg        | mg/kg   | mg/kg   | mg/kg        | mg/kg         | mg/kg                    | mg/kg                | mg/kg              | mg/kg      |  |
| AEC31ATP29   | 0 - 0.1 m   | Fill        | 9/12/22     | 5          | <0.4    | 18                | 6      | 14    | <0.1                | 4      | 10    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ATP30   | 0 - 0.1 m   | Fill        | 9/12/22     | 300 100 90 | <0.4    | 300 190 17000 210 | 12     | 21    | <0.1                | 6      | 13    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ATP31   | 0 - 0.1 m   | Fill        | 9/12/22     | 6          | <0.4    | 19                | 13     | 16    | <0.1                | 5      | 13    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ATP32   | 0 - 0.1 m   | Fill        | 9/12/22     | 300 100 90 | <0.4    | 300 190 17000 210 | 14     | 16    | <0.1                | 5      | 13    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ATP32   | 0.5 - 0.6 m | Fill        | 9/12/22     | 6          | <0.4    | 28                | 10     | 21    | <0.1                | 8      | 18    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ATP33   | 0 - 0.1 m   | Fill        | 9/12/22     | 300 100 90 | <0.4    | 300 190 17000 210 | 12     | 21    | <0.1                | 5      | 14    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA34   | 0 - 0.05 m  | Fill        | 16/12/2022  | 6          | <0.4    | 15                | 13     | 20    | <0.1                | 4      | 18    | <25                            | <50          | <25                  | <50                           | 140          | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| BD1/20221216 | 0 - 0.05 m  | Fill        | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 12     | 19    | <0.1                | 4      | 18    | <25                            | <50          | <25                  | <50                           | 160          | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA35   | 0 - 0.1 m   | Fill        | 16/12/2022  | 6          | <0.4    | 17                | 8      | 22    | <0.1                | 3      | 10    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA35   | 0.4 - 0.5 m | Natrual     | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 18     | 13    | <0.1                | 5      | 14    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA36   | 0 - 0.1 m   | Fill        | 16/12/2022  | 5          | <0.4    | 15                | 7      | 20    | <0.1                | 3      | 10    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA37   | 0 - 0.1 m   | Fill        | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 9      | 21    | <0.1                | 5      | 8     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA38   | 0 - 0.1 m   | Fill        | 16/12/2022  | 4          | <0.4    | 14                | 8      | 15    | <0.1                | 3      | 6     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA38   | 0.2 - 0.3 m | Natural     | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 20     | 14    | <0.1                | 6      | 14    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA39   | 0 - 0.1 m   | Fill        | 16/12/2022  | 4          | <0.4    | 13                | 7      | 15    | <0.1                | 3      | 6     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| BD2/20221216 | 0 - 0.1 m   | Fill        | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 10     | 16    | <0.1                | <5     | 14    | <20                            | <50          | <20                  | <50                           | <100         | <100         | <0.1    | <0.1    | <0.1         | <0.1          | <0.5                     | <0.5                 | <0.5               | <0.5       |  |
| AEC31AHA39   | 0.8 - 0.9 m | Natural     | 16/12/2022  | 5          | <0.4    | 19                | 17     | 12    | <0.1                | 6      | 15    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31AHA40   | 0 - 0.1 m   | Fill        | 16/12/2022  | 300 100 90 | <0.4    | 300 190 17000 210 | 8      | 20    | <0.1                | 4      | 9     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ASED1   | -           | Sediment    | 17/01/2023  | 6          | <0.4    | 11                | 9      | 9     | <0.1                | 1      | 7     | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ASED2   | -           | Sediment    | 17/01/2023  | 300 100 90 | <0.4    | 300 190 17000 210 | 120    | 11    | <0.1                | 4      | 150   | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ASED3   | -           | Sediment    | 17/01/2023  | 300 100 90 | <0.4    | 300 190 17000 210 | 89     | 17    | <0.1                | 7      | 99    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |
| AEC31ASED4   | -           | Sediment    | 17/01/2023  | 19         | <0.4    | 36                | 27     | 31    | <0.1                | 13     | 47    | <25                            | <50          | <25                  | <50                           | <100         | <100         | <0.2    | <0.5    | <1           | <1            | <0.1                     | <0.05                | <0.5               | <0.05      |  |

|                                |
|--------------------------------|
| Lab result                     |
| HIL/HSL value    EIL/ESL value |

  HIL/HSL exceedance      EIL/ESL exceedance      HIL/HSL and EIL/ESL exceedance      ML exceedance      ML and HIL/HSL or EIL/ESL exceedance

  Indicates that asbestos has been detected by the lab, refer to the lab report      Blue = DC exceedance      HSL 0-<1 Exceedance

**Bold** = Lab detections    - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable    NL = Non limiting    AD = Asbestos detected    NAD = No Asbestos detected

Table I1: Summary of Laboratory Results for Soil – Phenols, OCP, OPP, PCB, Asbestos

|                           |             |             | Phenols       |        |                   |         |               | OCP            |       |                   |                 |        |                  |           |                   |              |           | OPP           |           | PCB       | Asbestos                            |                                       |                      |   |     |   |   |   |     |      |   |   |   |   |     |        |
|---------------------------|-------------|-------------|---------------|--------|-------------------|---------|---------------|----------------|-------|-------------------|-----------------|--------|------------------|-----------|-------------------|--------------|-----------|---------------|-----------|-----------|-------------------------------------|---------------------------------------|----------------------|---|-----|---|---|---|-----|------|---|---|---|---|-----|--------|
|                           |             |             | Total Phenols | Phenol | Pentachlorophenol | Cresols | Other phneols | DDT+DDE+DDD °C | DDT   | Aldrin & Dieldrin | Total Chlordane | Endrin | Total Endosulfan | Hepachlor | Hexachlorobenzene | Methoxychlor | Other OCP | Chlorpyrifhos | Other OPP | Total PCB | Asbestos ID in soil >0.1g/kg (60 g) | Asbestos ID in soil <0.1g/kg (500 mL) | FA and AF Estimation |   |     |   |   |   |     |      |   |   |   |   |     |        |
| Sample ID                 | Depth       | Sample Date | mg/kg         | mg/kg  | mg/kg             | mg/kg   | mg/kg         | mg/kg          | mg/kg | mg/kg             | mg/kg           | mg/kg  | mg/kg            | mg/kg     | mg/kg             | mg/kg        | mg/kg     | mg/kg         | mg/kg     | mg/kg     | -                                   | -                                     | %(w/w)               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP01                | 0 - 0.05 m  | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP01                | 0 - 0.05 m  | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP01 - [TRIPLICATE] | 0 - 0.05 m  | 8/12/22     | -             | -      | -                 | -       | -             | -              | -     | -                 | -               | -      | -                | -         | -                 | -            | <PQL      | -             | <PQL      | -         | -                                   | -                                     | -                    | - | -   | - | - | - | -   | <PQL | - | - | - | - | -   |        |
| AEC31ATP01                | 0.1 - 0.2 m | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | -                    |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP02                | 0 - 0.05 m  | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP03                | 0 - 0.05 m  | 9/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP04                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP05                | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| BD1/20221209              | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | -   | -      |
| AEC31ATP06                | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP07                | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP08                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP09                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| BD4/20221208              | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP10                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP10                | 0.3 - 0.4 m | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | -                    |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP11                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP12                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP13                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| BD3/20221208              | 0 - 0.1 m   | 8/12/22     | -             | <0.5   | <1                | <0.5    | <PQL          | <0.05          | <0.05 | <0.05             | <0.1            | <0.05  | <0.05            | <0.05     | <0.05             | <0.05        | <0.05     | <0.05         | <0.05     | <0.05     | -                                   | -                                     | -                    |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP14                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP15                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP16                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP17                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP18                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP19                | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| BD2/20221209              | 0 - 0.1 m   | 9/12/22     | -             | <0.5   | <1                | <0.5    | <PQL          | <0.05          | <0.05 | <0.05             | <0.1            | <0.05  | <0.05            | <0.05     | <0.05             | <0.05        | <0.05     | <0.05         | <0.05     | <0.05     | -                                   | -                                     | -                    |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP20                | 0 - 0.1 m   | 8/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP20                | 0.5 - 0.6 m | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP21                | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP22                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP23                | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | -   | -      |
| AEC31ATP24                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP25                | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP26                | 0 - 0.1 m   | 8/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP27                | 0 - 0.1 m   | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | NAD | <0.001 |
| AEC31ATP28                | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <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      | -                                   | -                                     | <0.001               |   |     |   |   |   |     |      |   |   |   |   |     |        |
| AEC31ATP28                | 0.3 - 0.4 m | 9/12/22     | 120           | -      | 40000             | -       | 120           | -              | 400   | 180               | -               | 180    | 10               | -         | 70                | -            | 20        | -             | 340       | -         | 10                                  | -                                     | 10                   | - | 400 | - | - | - | 250 | -    | - | 1 | - | - | -   | -      |

Table I1: Summary of Laboratory Results for Soil – Phenols, OCP, OPP, PCB, Asbestos

|              |             |             | Phenols       |        |                   |         |               | OCP           |       |                   |                 |        |                  |            |                    |              |           | OPP          |           | PCB       | Asbestos                            |                                       |                      |   |    |   |    |   |     |   |   |   |   |
|--------------|-------------|-------------|---------------|--------|-------------------|---------|---------------|---------------|-------|-------------------|-----------------|--------|------------------|------------|--------------------|--------------|-----------|--------------|-----------|-----------|-------------------------------------|---------------------------------------|----------------------|---|----|---|----|---|-----|---|---|---|---|
|              |             |             | Total Phenols | Phenol | Pentachlorophenol | Cresols | Other phneols | DDT+DDE+DDD ε | DDT   | Aldrin & Dieldrin | Total Chlordane | Endrin | Total Endosulfan | Heptachlor | Hexachlorobenzen ε | Methoxychlor | Other OCP | Chlorpyrifos | Other OPP | Total PCB | Asbestos ID in soil >0.1g/kg (50 g) | Asbestos ID in soil <0.1g/kg (500 mL) | FA and AF Estimation |   |    |   |    |   |     |   |   |   |   |
| Sample ID    | Depth       | Sample Date | mg/kg         | mg/kg  | mg/kg             | mg/kg   | mg/kg         | mg/kg         | mg/kg | mg/kg             | mg/kg           | mg/kg  | mg/kg            | mg/kg      | mg/kg              | mg/kg        | mg/kg     | mg/kg        | mg/kg     | mg/kg     | -                                   | -                                     | %(w/w)               |   |    |   |    |   |     |   |   |   |   |
| AEC31ATP29   | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ATP30   | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ATP31   | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ATP32   | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ATP32   | 0.5 - 0.6 m | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ATP33   | 0 - 0.1 m   | 9/12/22     | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA34   | 0 - 0.05 m  | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| BD1/20221216 | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA35   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA35   | 0.4 - 0.5 m | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA36   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA37   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA38   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA38   | 0.2 - 0.3 m | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA39   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| BD2/20221216 | 0 - 0.1 m   | 16/12/2022  | -             | <0.5   | <1                | <0.5    | <PQL          | <0.05         | <0.05 | <0.05             | <0.1            | <0.05  | <0.05            | <0.05      | <0.05              | <0.05        | <PQL      | <0.2         | <PQL      | <0.1      | -                                   | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA39   | 0.8 - 0.9 m | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | NAD                                 | -                                     | -                    |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31AHA40   | 0 - 0.1 m   | 16/12/2022  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ASED1   | -           | 17/01/2023  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ASED2   | -           | 17/01/2023  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ASED3   | -           | 17/01/2023  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |
| AEC31ASED4   | -           | 17/01/2023  | <5            | -      | -                 | -       | -             | <0.1          | <0.1  | <0.1              | <0.1            | <0.1   | <0.1             | <0.1       | <0.1               | <0.1         | <PQL      | <0.1         | <PQL      | <0.1      | -                                   | NAD                                   | <0.001               |   |    |   |    |   |     |   |   |   |   |
|              |             |             | 120           | -      | 40000             | -       | 120           | -             | 4000  | -                 | -               | -      | 400              | 180        | -                  | 180          | 10        | -            | 70        | -         | 20                                  | -                                     | 340                  | - | 10 | - | 10 | - | 400 | - | - | - | 1 |

Lab result

HIL/HSL value

EIL/ESL value

HIL/HSL exceedance

EIL/ESL exceedance

HIL/HSL and EIL/ESL exceedance

ML exceedance

ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report

Blue

 = DC exceedance

HSL 0-<1 Exceedance

**Bold** = Lab detections

-

 = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable

NL

 = Non limiting

AD

 = Asbestos detected

NAD

 = No Asbestos detected

HIL

 = Health investigation level

HSL

 = Health screening level (excluding DC)

EIL

 = Ecological investigation level

ESL

 = Ecological screening level

ML

 = Management Limit

DC

 =

- Notes:
- a

QA/QC replicate of sample listed directly below the primary sample
- b

Reported naphthalene laboratory result obtained from BTEXN suite
- c

Criteria applies to DDT only

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Recreational C including public open space with amenities buildings

HIL C

Recreational / Open Space (NEPC, 2013)

HSL D

Commercial / Industrial (vapour intrusion) (NEPC, 2013)

DC HSL C

Direct contact HSL C Recreational /Open space (direct contact) (CRC CARE, 2011)

EIL/ESL UR/POS

Urban Residential and Public Open Space (NEPC, 2013)

ML R/P/POS

Residential, Parkland and Public Open Space (NEPC, 2013)



| Notes:       |                                                   |
|--------------|---------------------------------------------------|
| PQL          | Practical Quantitation Limit                      |
| -            | not defined/ not analysed/ not applicable         |
| *            | May be adjusted for hardness                      |
| NL           | Not Limiting                                      |
| BD1/20230213 | Intra-lab replicate from AEC31ABH01               |
| BD2/20230213 | Intra-lab replicate from AEC31ABH02               |
| BD2/20230124 | Intra-lab replicate from AEC31ABW1                |
| BD3/20230124 | Inter-lab replicate from AEC31ASW2                |
|              | Exceedance of DGV or freshwater quality guideline |
|              | Exceedance of Aesthetic Guideline                 |

**Table I3(continued): Summary of Results of Groundwater and Surface Water Analysis (All results in µg/L)**

| Sample Location / Identification (Borehole or Replicate) | Sample Date | Organochlorine Pesticides |          |                 |                 |                  |        |              |               |        |            |              |         | Organophosphorus Pesticides |                 |                 |              |                 |          |             |            |            |        |                        |              |                |          |           |                      | Polychlorinated Biphenyls |           |           | Phenols          |            |          |                   |                   |           |              |              |           |        |                       |                   |               |                           |                          |                   |                |                    |                    |                    |                           |                               |               |      |      |
|----------------------------------------------------------|-------------|---------------------------|----------|-----------------|-----------------|------------------|--------|--------------|---------------|--------|------------|--------------|---------|-----------------------------|-----------------|-----------------|--------------|-----------------|----------|-------------|------------|------------|--------|------------------------|--------------|----------------|----------|-----------|----------------------|---------------------------|-----------|-----------|------------------|------------|----------|-------------------|-------------------|-----------|--------------|--------------|-----------|--------|-----------------------|-------------------|---------------|---------------------------|--------------------------|-------------------|----------------|--------------------|--------------------|--------------------|---------------------------|-------------------------------|---------------|------|------|
|                                                          |             | Aldrin                    | Dieldrin | gamma-Chlordane | alpha-Chlordane | Total Chlordanes | pp-DDT | Endosulfan I | Endosulfan II | Endrin | Heptachlor | Methoxychlor | Lindane | Other OCP                   | Azinphos-methyl | Bromophos-ethyl | Chlorpyrifos | Chlorfenvinphos | Diazinon | Dichlorovos | Dimethoate | Disulfoton | Ethion | Ethoprophos (Ethoprop) | Fenitrothion | Fensulfotthion | Fenthion | Malathion | Mevinphos (Phosdrin) | Monocrotophos             | Omethoate | Parathion | Methyl Parathion | Pyrazophos | Terbufos | Tetrachlorvinphos | Phirimphos-methyl | Other OPP | Aroclor 1242 | Aroclor 1254 | Other PCB | Phenol | 2,4,6-Trichlorophenol | 2,4-Dinitrophenol | 4-Nitrophenol | 2,3,4,6-Tetrachlorophenol | Total Tetrachlorophenols | Pentachlorophenol | 2-Chlorophenol | 2,4-Dimethylphenol | 2,4-Dichlorophenol | 2,6-Dichlorophenol | 2-Methylphenol (o-Cresol) | 3/4-Methylphenol (m/p-Cresol) | Other Phenols |      |      |
| AEC31ABH01                                               | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | <0.2                   | -            | -              | <0.05    | -         | -                    | -                         | <0.01     | <0.2      | -                | -          | -        | -                 | <PQL              | <0.1      | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | -                         | <5                       | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <2                            | <PQL          |      |      |
| BD1/20230213                                             | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | <1                            | <2            | <PQL |      |
| AEC31ABH02                                               | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | <1                            | <2            | <PQL |      |
| BD2/20230213                                             | 13/02/2023  | <0.2                      | <0.2     | <0.2            | <0.2            | <PQL             | <0.2   | <0.2         | <0.2          | <0.2   | <0.2       | <0.2         | <PQL    | <2                          | <2              | <2              | <1           | <2              | <2       | <2          | <1         | <2         | <1     | <1                     | <2           | <1             | <1       | <2        | <1                   | <1                        | <1        | <2        | <2               | <1         | <1       | <1                | <10               | <PQL      | <1           | <1           | <PQL      | <3     | <10                   | <30               | <10           | -                         | <30                      | <10               | <3             | <3                 | <3                 | <3                 | <3                        | <6                            | <PQL          |      |      |
| AEC31ABH03                                               | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | 1                         | <2                            | <PQL          |      |      |
| AEC31ASW1                                                | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | 3                             | <PQL          |      |      |
| BD2/20230124                                             | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | <2                            | <PQL          |      |      |
| AEC31ASW2                                                | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | 7                             | <PQL          |      |      |
| BD3/30230124                                             | 24/01/2023  | <0.2                      | <0.2     | <0.2            | <0.2            | <PQL             | <0.2   | <0.2         | <0.2          | <0.2   | <0.2       | <0.2         | <PQL    | <2                          | <2              | <2              | <20          | <2              | <2       | <2          | <2         | <2         | <2     | <2                     | <2           | <2             | <2       | <2        | <2                   | <2                        | <2        | <2        | <2               | <2         | <2       | <20               | <2                | <2        | <2           | <PQL         | <1        | <1     | <PQL                  | <3                | <10           | <30                       | <10                      | -                 | <30            | <10                | <3                 | <3                 | <3                        | <3                            | <3            | 15   | <PQL |
| AEC31ASW3                                                | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | <2                            | <PQL          |      |      |
| AEC31ASW4                                                | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | -            | <0.01           | <0.2     | <0.15       | -          | <0.2       | -      | -                      | <0.05        | -              | -        | -         | <0.05                | -                         | -         | <0.01     | <0.2             | -          | -        | -                 | -                 | <PQL      | <0.1         | <0.1         | <PQL      | <1     | <1                    | <20               | <20           | <1                        | -                        | <5                | <1             | <1                 | <1                 | <1                 | <1                        | <2                            | <PQL          |      |      |
| Assessment Criteria                                      |             |                           |          |                 |                 |                  |        |              |               |        |            |              |         |                             |                 |                 |              |                 |          |             |            |            |        |                        |              |                |          |           |                      |                           |           |           |                  |            |          |                   |                   |           |              |              |           |        |                       |                   |               |                           |                          |                   |                |                    |                    |                    |                           |                               |               |      |      |
| Freshwater DGV                                           |             | 0.001                     | 0.01     | 0.03            |                 |                  | 0.006  | 0.03         |               | 0.01   | 0.01       | 0.005        | 0.2     | -                           | 0.01            | -               | 0.01         | -               | 0.01     | -           | 0.15       | -          | -      | -                      | 0.2          | -              | -        | 0.05      | -                    | -                         | -         | 0.004     | -                | -          | -        | -                 | -                 | 0.3       | 0.01         | -            | 320       | 3      | 45                    | 58                | 10            | 0.2                       | 3.6                      | 340               | 2              | 120                | 34                 | -                  | -                         | -                             |               |      |      |
| Guidelines for Recreational Water                        | Health      | 3                         |          | 20              |                 |                  | 90     | 200          |               | -      | 3          | 3000         | 100     | -                           | 300             | 100             | 100          | 20              | 40       | 50          | 70         | 40         | 40     | 10                     | 70           | 100            | 70       | 700       | 50                   | 20                        | 10        | 200       | 7                | 200        | 9        | 1000              | 900               | -         | -            | -            | -         | -      | 200                   | -                 | -             | -                         | -                        | 100               | 3000           | -                  | 2000               | -                  | -                         | -                             | -             |      |      |
|                                                          | Aesthetic   | -                         | -        | -               | -               | -                | -      | -            | -             | -      | -          | -            | -       | -                           | -               | -               | -            | -               | -        | -           | -          | -          | -      | -                      | -            | -              | -        | -         | -                    | -                         | -         | -         | -                | -          | -        | -                 | -                 | -         | 2            | -            | -         | -      | -                     | -                 | 0.1           | -                         | 0.3                      | -                 | -              | -                  | -                  |                    |                           |                               |               |      |      |
| HSL D for Vapour Intrusion, Clay (depth 2 m to <4 m)     |             | -                         | -        | -               | -               | -                | -      | -            | -             | -      | -          | -            | -       | -                           | -               | -               | -            | -               | -        | -           | -          | -          | -      | -                      | -            | -              | -        | -         | -                    | -                         | -         | -         | -                | -          | -        | -                 | -                 | -         | -            | -            | -         | -      | -                     | -                 | -             | -                         | -                        | -                 | -              | -                  | -                  | -                  |                           |                               |               |      |      |
| Freshwater Water Quality Guideline - NEMP 2.0            |             | -                         | -        | -               | -               | -                | -      | -            | -             | -      | -          | -            | -       | -                           | -               | -               | -            | -               | -        | -           | -          | -          | -      | -                      | -            | -              | -        | -         | -                    | -                         | -         | -         | -                | -          | -        | -                 | -                 | -         | -            | -            | -         | -      | -                     | -                 | -             | -                         | -                        | -                 | -              | -                  | -                  | -                  |                           |                               |               |      |      |
| Recreational Water Quality Guideline - NEMP 2.0          |             | -                         | -        | -               | -               | -                | -      | -            | -             | -      | -          | -            | -       | -                           | -               | -               | -            | -               | -        | -           | -          | -          | -      | -                      | -            | -              | -        | -         | -                    | -                         | -         | -         | -                | -          | -        | -                 | -                 | -         | -            | -            | -         | -      | -                     | -                 | -             | -                         | -                        | -                 | -              | -                  | -                  | -                  | -                         |                               |               |      |      |

|              |                                           |
|--------------|-------------------------------------------|
| Notes:       |                                           |
| PQL          | Practical Quantitation Limit              |
| -            | not defined/ not analysed/ not applicable |
| *            | May be adjusted for hardness              |
| NL           | Not Limiting                              |
| BD1/20230213 | Intra-lab replicate from AEC31ABH01       |
| BD2/20230213 | Intra-lab replicate from AEC31ABH02       |

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## **Appendix J**

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### Data Quality Assurance and Quality Control

## Data Quality Assurance and Quality Control Report for DSI for AEC 31a Surface & Civil Alignment Works (SCAW) Package for Sydney Metro - Western Sydney Airport (SMWSA)

### 1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA / QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included in the summary results Table J1 to J7.

**Table 1: Field and Laboratory Quality Control**

| Item                                | Evaluation / Acceptance Criteria                                                  | Compliance |
|-------------------------------------|-----------------------------------------------------------------------------------|------------|
| Analytical laboratories used        | NATA accreditation                                                                | C          |
| Holding times                       | Various based on type of analysis                                                 | PC         |
| Intra-laboratory replicates         | 5% of primary samples,                                                            | C          |
|                                     | <30% RPD                                                                          | PC         |
| Inter-laboratory replicates         | 5% of primary samples;                                                            | C          |
|                                     | <30% RPD                                                                          | PC         |
| Trip Spikes                         | 1 per sampling event; 60-140% recovery                                            | C          |
| Trip Blanks                         | 1 per sampling event; <PQL                                                        | C          |
| Rinsates                            | 1 per water sampling event; <PQL                                                  | C          |
| Laboratory / Reagent Blanks         | 1 per batch; <PQL                                                                 | C          |
| Laboratory Duplicate                | 1 per lab batch; As laboratory certificate                                        | PC         |
| Matrix Spikes                       | 1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)       | PC         |
| Surrogate Spikes                    | All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics) | C          |
| Control Samples                     | 1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)       | C          |
| Standard Operating Procedures (SOP) | Adopting SOP for all aspects of the sampling field work                           | C          |

Notes: C = compliance; PC = partial compliance; NC = non-compliance; NR Not required

Laboratory comments from a review of the laboratory certificates are listed as follows:

**Soils:**

- The RPD results for chromium, copper, lead and nickel for sample 312920-1 exceeded the laboratory acceptance criteria, therefore, a triplicate result was issued as laboratory sample number 312920-127.
- pH analysed outside holding time for batch 313553.
- 8 metals in soil sample of 313553-2 - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However, an acceptable recovery was obtained for the LCS.

**Sediments:**

- 8 metals in soil sample of 314763-2 - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
- All samples analysed as received. However, samples 314763-2,3 are below the minimum recommended 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

**Groundwater:**

- Dissolved Metals: no filtered, preserved sample was received for samples #8 and 11, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.

**Surface Water:**

- TRH Water(C10-C40) NEPM - The positive result in the rinsate sample (AECRINS01; 315291-8) is due to a single peak with no hydrocarbon profile that is consistent with the use of plastic containers.
- Speciated Phenols in water - The PQLs for 315291 has been raised due to the low spike recoveries. This may reflect other samples where similar in matrix and similar analytical interferences occur.
- Dissolved Metals: no filtered, preserved sample was received for samples #8 and 11, therefore the unpreserved sample was filtered through 0.45µm filter at the lab. Note: there is a possibility some elements may be underestimated.

It is considered that the above listed comments do not affect the overall assessment.

For soil, the RPD results for intra-laboratory and inter-laboratory analysis were within the acceptable range except for metals (arsenic, chromium, copper, lead, nickel, and zinc). The exceedances are not, however, considered to be of concern given the low actual differences in the concentrations between the primary and replicate samples and the nature of sampled fill where some heterogeneity is expected.

For water samples, RPD results for intra-laboratory and inter-laboratory analysis were within the acceptable range except for ammonia and metals (arsenic, chromium, copper, lead, and zinc). The difference in metals concentrations may be attributed the filtering of the primary sample at the primary laboratory and apparently not at the secondary laboratory. As the metals concentrations are considered to be within background ranges, the elevated RPD results are not considered to be of concern for the overall assessment.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

## 2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- **Completeness:** a measure of the amount of usable data from a data collection activity;
- **Comparability:** the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- **Representativeness:** the confidence (qualitative) of data representativeness of media present on-site;
- **Precision:** a measure of variability or reproducibility of data; and
- **Accuracy:** a measure of closeness of the data to the 'true' value.

**Table 2: Data Quality Indicators**

| <b>Data Quality Indicator</b> | <b>Method(s) of Achievement</b>                                                                                                  |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Completeness                  | Systematic locations sampled.                                                                                                    |
|                               | Preparation of logs, sample location plan and chain of custody records.                                                          |
|                               | Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody. |
|                               | Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).                     |
|                               | Completion of chain of custody (COC) documentation.                                                                              |
|                               | NATA accredited laboratory results certificates provided by the laboratory.                                                      |
|                               | Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed above.                     |

| Data Quality Indicator | Method(s) of Achievement                                                                                                           |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Comparability          | Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project. |
|                        | Experienced sampler(s) used.                                                                                                       |
|                        | Use of NATA registered laboratories, with test methods the same or similar between laboratories.                                   |
|                        | Satisfactory results for field and laboratory QC samples.                                                                          |
| Representativeness     | Target media sampled.                                                                                                              |
|                        | Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.             |
|                        | Samples were extracted and analysed within holding times.                                                                          |
|                        | Samples were analysed in accordance with the COC.                                                                                  |
| Precision              | Field staff followed standard operating procedures.                                                                                |
|                        | Acceptable RPD between original samples and replicates.                                                                            |
|                        | Satisfactory results for all other field and laboratory QC samples.                                                                |
| Accuracy               | Field staff followed standard operating procedures.                                                                                |
|                        | Satisfactory results for all field and laboratory QC samples.                                                                      |

Based on the above, it is considered that the DQIs have been generally complied with.

### 3.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

### 4.0 References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

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**Douglas Partners Pty Ltd**

Table J1: Relative Percentage Difference Results – Soils

|                            |            |             | Metals  |         |                |        |       |                     |        |       | TRH          |              |                    |                                |               |               |         |
|----------------------------|------------|-------------|---------|---------|----------------|--------|-------|---------------------|--------|-------|--------------|--------------|--------------------|--------------------------------|---------------|---------------|---------|
|                            |            |             | Arsenic | Cadmium | Total Chromium | Copper | Lead  | Mercury (inorganic) | Nickel | Zinc  | TRH C6 - C10 | TRH >C10-C16 | F1 ((C6-C10)-BTEX) | F2 (>C10-C16 less Naphthalene) | F3 (>C16-C34) | F4 (>C34-C40) | Benzene |
| Sample ID                  | Depth      | Sample Date | mg/kg   | mg/kg   | mg/kg          | mg/kg  | mg/kg | mg/kg               | mg/kg  | mg/kg | mg/kg        | mg/kg        | mg/kg              | mg/kg                          | mg/kg         | mg/kg         | mg/kg   |
| BD1/20221209               | 0 - 0.1 m  | 9/12/22     | 6       | <0.4    | 25             | 4      | 13    | <0.1                | 2      | 17    | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| AEC31ATP05                 | 0 - 0.1 m  | 9/12/22     | 6       | <0.4    | 22             | 6      | 13    | <0.1                | 2      | 15    | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| Intra-laboratory Replicate |            | Difference  | 0       | 0       | 3              | 2      | 0     | 0                   | 0      | 2     | 0            | 0            | 0                  | 0                              | 0             | 0             | 0       |
|                            |            | RPD         | 0%      | 0%      | 13%            | 40%    | 0%    | 0%                  | 0%     | 13%   | 0%           | 0%           | 0%                 | 0%                             | 0%            | 0%            | 0%      |
| BD4/20221208               | 0 - 0.1 m  | 8/12/22     | 6       | <0.4    | 17             | 10     | 15    | <0.1                | 2      | 12    | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| AEC31ATP09                 | 0 - 0.1 m  | 8/12/22     | 5       | <0.4    | 14             | 7      | 13    | <0.1                | 2      | 8     | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| Intra-laboratory Replicate |            | Difference  | 1       | 0       | 3              | 3      | 2     | 0                   | 0      | 4     | 0            | 0            | 0                  | 0                              | 0             | 0             | 0       |
|                            |            | RPD         | 18%     | 0%      | 19%            | 35%    | 14%   | 0%                  | 0%     | 40%   | 0%           | 0%           | 0%                 | 0%                             | 0%            | 0%            | 0%      |
| BD3/20221208               | 0 - 0.1 m  | 08 Dec 2022 | 4.6     | <0.4    | 23             | 8.9    | 10    | <0.1                | <5     | 23    | <20          | <50          | <20                | <50                            | <100          | <100          | <0.1    |
| AEC31ATP13                 | 0 - 0.1 m  | 8/12/22     | 5       | <0.4    | 34             | 8      | 15    | <0.1                | 4      | 18    | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| Inter-laboratory Replicate |            | Difference  | 0.4     | 0       | 11             | 0.9    | 5     | 0                   | 1      | 5     | 5            | 0            | 5                  | 0                              | 0             | 0             | 0       |
|                            |            | RPD         | 8%      | 0%      | 39%            | 11%    | 40%   | 0%                  | 22%    | 24%   | 22%          | 0%           | 22%                | 0%                             | 0%            | 0%            | 0%      |
| BD2/20221209               | 0 - 0.1 m  | 09 Dec 2022 | 16      | <0.4    | 71             | 7.6    | 25    | <0.1                | 5.6    | 16    | <20          | <50          | <20                | <50                            | <100          | <100          | <0.1    |
| AEC31ATP19                 | 0 - 0.1 m  | 9/12/22     | 8       | <0.4    | 44             | 4      | 19    | <0.1                | 4      | 8     | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| Inter-laboratory Replicate |            | Difference  | 8       | 0       | 27             | 3.6    | 6     | 0                   | 1.6    | 8     | 5            | 0            | 5                  | 0                              | 0             | 0             | 0       |
|                            |            | RPD         | 67%     | 0%      | 47%            | 62%    | 27%   | 0%                  | 33%    | 67%   | 22%          | 0%           | 22%                | 0%                             | 0%            | 0%            | 0%      |
| BD1/20221216               | 0 - 0.05 m | 16 Dec 2022 | 6       | <0.4    | 15             | 13     | 20    | <0.1                | 4      | 18    | <25          | <50          | <25                | <50                            | 140           | <100          | <0.2    |
| AEC31AHA34                 | 0 - 0.1 m  | 16/12/2022  | 4       | <0.4    | 15             | 12     | 19    | <0.1                | 4      | 18    | <25          | <50          | <25                | <50                            | 160           | <100          | <0.2    |
| Intra-laboratory Replicate |            | Difference  | 2       | 0       | 0              | 1      | 1     | 0                   | 0      | 0     | 0            | 0            | 0                  | 0                              | 20            | 0             | 0       |
|                            |            | RPD         | 40%     | 0%      | 0%             | 8%     | 5.1%  | 0%                  | 0%     | 0%    | 0%           | 0%           | 0%                 | 0%                             | 13.3%         | 0%            | 0%      |
| BD2/20221216               | 0 - 0.1 m  | 16 Dec 2022 | 5.8     | <0.4    | 16             | 10     | 16    | <0.1                | <5     | 14    | <20          | <50          | <20                | <50                            | <100          | <100          | <0.1    |
| AEC31AHA39                 | 0 - 0.1 m  | 16/12/2022  | 4       | <0.4    | 13             | 7      | 15    | <0.1                | 3      | 6     | <25          | <50          | <25                | <50                            | <100          | <100          | <0.2    |
| Inter-laboratory Replicate |            | Difference  | 1.8     | 0       | 3              | 3      | 1     | 0                   | 2      | 8     | 5            | 0            | 5                  | 0                              | 0             | 0             | 0       |
|                            |            | RPD         | 37%     | 0%      | 21%            | 35%    | 6%    | 0%                  | 50%    | 80%   | 22%          | 0%           | 22%                | 0%                             | 0%            | 0%            | 0%      |

Table J1: Relative Percentage

|                            |            |             | BTEX    |         |         |              |              |          |          |            |            |               | PAH                      |                      |                    |            | Phenol |
|----------------------------|------------|-------------|---------|---------|---------|--------------|--------------|----------|----------|------------|------------|---------------|--------------------------|----------------------|--------------------|------------|--------|
|                            |            |             | Benzene | Toluene | Toluene | Ethylbenzene | Ethylbenzene | o-Xylene | o-Xylene | m+p-Xylene | m+p-Xylene | Total Xylenes | Naphthalene <sup>b</sup> | Benzo(a)pyrene (BaP) | Benzo(a)pyrene TEQ | Total PAHs | Phenol |
| Sample ID                  | Depth      | Sample Date | µg/l    | mg/kg   | µg/l    | mg/kg        | µg/l         | mg/kg    | µg/l     | mg/kg      | µg/l       | mg/kg         | mg/kg                    | mg/kg                | mg/kg              | mg/kg      | mg/kg  |
| BD1/20221209               | 0 - 0.1 m  | 9/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| AEC31ATP05                 | 0 - 0.1 m  | 9/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Intra-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | 0          | 0      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | 0%         | 0%     |
| BD4/20221208               | 0 - 0.1 m  | 8/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| AEC31ATP09                 | 0 - 0.1 m  | 8/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Intra-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | 0          | 0      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | 0%         | 0%     |
| BD3/20221208               | 0 - 0.1 m  | 08 Dec 2022 | NT      | <0.1    | NT      | <0.1         | NT           | <0.1     | NT       | <0.2       | NT         | <0.1          | <0.5                     | <0.5                 | <0.5               | NT         | NT     |
| AEC31ATP13                 | 0 - 0.1 m  | 8/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Inter-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | -          | -      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | -          | -      |
| BD2/20221209               | 0 - 0.1 m  | 09 Dec 2022 | NT      | <0.1    | NT      | <0.1         | NT           | <0.1     | NT       | <0.2       | NT         | <0.1          | <0.5                     | <0.5                 | <0.5               | NT         | NT     |
| AEC31ATP19                 | 0 - 0.1 m  | 9/12/22     | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Inter-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | -          | -      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | -          | -      |
| BD1/20221216               | 0 - 0.05 m | 16 Dec 2022 | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | NT         | NT     |
| AEC31AHA34                 | 0 - 0.1 m  | 16/12/2022  | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Intra-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | -          | -      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | -          | -      |
| BD2/20221216               | 0 - 0.1 m  | 16 Dec 2022 | NT      | <0.1    | NT      | <0.1         | NT           | <0.1     | NT       | <0.2       | NT         | <0.1          | <0.5                     | <0.5                 | <0.5               | NT         | NT     |
| AEC31AHA39                 | 0 - 0.1 m  | 16/12/2022  | NT      | <0.5    | NT      | <1           | NT           | <1       | NT       | <2         | NT         | <1            | <0.1                     | <0.05                | <0.5               | <0.05      | <5     |
| Inter-laboratory Replicate |            | Difference  | -       | 0       | -       | 0            | -            | 0        | -        | 0          | -          | 0             | 0                        | 0                    | 0                  | -          | -      |
|                            |            | RPD         | -       | 0%      | -       | 0%           | -            | 0%       | -        | 0%         | -          | 0%            | 0%                       | 0%                   | 0%                 | -          | -      |

Table J1: Relative Percentage

|                            |            |             | OCP   |                          |       |       |        |          |                   |                 |                 |              |                 |               |                     |        |                  |
|----------------------------|------------|-------------|-------|--------------------------|-------|-------|--------|----------|-------------------|-----------------|-----------------|--------------|-----------------|---------------|---------------------|--------|------------------|
|                            |            |             | DDD   | DDT+DDE+DDD <sup>c</sup> | DDE   | DDT   | Aldrin | Dieldrin | Aldrin & Dieldrin | alpha-chlordane | gamma-Chlordane | Endosulfan I | Total Chlordane | Endosulfan II | Endosulfan Sulphate | Endrin | Total Endosulfan |
| Sample ID                  | Depth      | Sample Date | mg/kg | mg/kg                    | mg/kg | mg/kg | mg/kg  | mg/kg    | mg/kg             | mg/kg           | mg/kg           | mg/kg        | mg/kg           | mg/kg         | mg/kg               | mg/kg  | mg/kg            |
| BD1/20221209               | 0 - 0.1 m  | 9/12/22     | <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             |
| AEC31ATP05                 | 0 - 0.1 m  | 9/12/22     | <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             |
| Intra-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | 0               | 0               | 0            | 0               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | 0%              | 0%              | 0%           | 0%              | 0%            | 0%                  | 0%     | 0%               |
| BD4/20221208               | 0 - 0.1 m  | 8/12/22     | <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             |
| AEC31ATP09                 | 0 - 0.1 m  | 8/12/22     | <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             |
| Intra-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | 0               | 0               | 0            | 0               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | 0%              | 0%              | 0%           | 0%              | 0%            | 0%                  | 0%     | 0%               |
| BD3/20221208               | 0 - 0.1 m  | 08 Dec 2022 | <0.05 | <0.05                    | <0.05 | <0.05 | <0.05  | <0.05    | <0.05             | NT              | NT              | <0.05        | NT              | <0.05         | <0.05               | <0.05  | <0.05            |
| AEC31ATP13                 | 0 - 0.1 m  | 8/12/22     | <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             |
| Inter-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | -               | -               | 0            | -               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | -               | -               | 0%           | -               | 0%            | 0%                  | 0%     | 0%               |
| BD2/20221209               | 0 - 0.1 m  | 09 Dec 2022 | <0.05 | <0.05                    | <0.05 | <0.05 | <0.05  | <0.05    | <0.05             | NT              | NT              | <0.05        | NT              | <0.05         | <0.05               | <0.05  | <0.05            |
| AEC31ATP19                 | 0 - 0.1 m  | 9/12/22     | <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             |
| Inter-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | -               | -               | 0            | -               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | -               | -               | 0%           | -               | 0%            | 0%                  | 0%     | 0%               |
| BD1/20221216               | 0 - 0.05 m | 16 Dec 2022 | <0.1  | <0.1                     | <0.1  | <0.1  | <0.1   | <0.1     | <0.1              | NT              | NT              | <0.1         | NT              | <0.1          | <0.1                | <0.1   | <0.1             |
| AEC31AHA34                 | 0 - 0.1 m  | 16/12/2022  | <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             |
| Intra-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | -               | -               | 0            | -               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | -               | -               | 0%           | -               | 0%            | 0%                  | 0%     | 0%               |
| BD2/20221216               | 0 - 0.1 m  | 16 Dec 2022 | <0.05 | <0.05                    | <0.05 | <0.05 | <0.05  | <0.05    | <0.05             | NT              | NT              | <0.05        | NT              | <0.05         | <0.05               | <0.05  | <0.05            |
| AEC31AHA39                 | 0 - 0.1 m  | 16/12/2022  | <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             |
| Inter-laboratory Replicate |            | Difference  | 0     | 0                        | 0     | 0     | 0      | 0        | 0                 | -               | -               | 0            | -               | 0             | 0                   | 0      | 0                |
|                            |            | RPD         | 0%    | 0%                       | 0%    | 0%    | 0%     | 0%       | 0%                | -               | -               | 0%           | -               | 0%            | 0%                  | 0%     | 0%               |

Table J1: Relative Percentage

[illegible]

Table J2: Trip Blank Results - Soils (mg/kg)

| Sample ID | Benzene | Toluene | Ethylbenzene | o-Xylene | m+p-Xylene |
|-----------|---------|---------|--------------|----------|------------|
| TB-081222 | <1      | <1      | <1           | <1       | <2         |
| TB-091222 | <1      | <1      | <1           | <1       | <2         |
| TB-161222 | ND      | ND      | ND           | ND       | ND         |

Table J3: Trip Spike Results – Soils (% Recovery)

| Sample ID | Benzene | Toluene | Ethylbenzene | o-Xylene | m+p-Xylene |
|-----------|---------|---------|--------------|----------|------------|
| TS-081222 | 115     | 117     | 112          | 113      | 119        |
| TS-091222 | 113     | 119     | 118          | 119      | 120        |
| TS-161222 | ND      | ND      | ND           | ND       | ND         |



Table J4 (continued): Relative Percentage Difference Results – Groundwater and Surface Water (All results in µg/L)

| Sample Location /<br>Identification (Borehole or<br>Replicate) | Sample Date | Organochlorine Pesticides |          |                 |                 |                  |        |              |               |        |            |              |         | Organophosphorus Pesticides |                 |                 |              |          |             |            |        |              |           |           |                  | Polychlorinated<br>Biphenyls |              |              | Phenols   |        |                       |                   |               |                           |                   |                |                    |                    |                    |                           |               |           |  |  |  |
|----------------------------------------------------------------|-------------|---------------------------|----------|-----------------|-----------------|------------------|--------|--------------|---------------|--------|------------|--------------|---------|-----------------------------|-----------------|-----------------|--------------|----------|-------------|------------|--------|--------------|-----------|-----------|------------------|------------------------------|--------------|--------------|-----------|--------|-----------------------|-------------------|---------------|---------------------------|-------------------|----------------|--------------------|--------------------|--------------------|---------------------------|---------------|-----------|--|--|--|
|                                                                |             | Aldrin                    | Dieldrin | gamma-Chlordane | alpha-Chlordane | Total Chlordanes | pp-DDT | Endosulfan I | Endosulfan II | Endrin | Heptachlor | Methoxychlor | Lindane | Other OCP                   | Azinphos-methyl | Bromophos-ethyl | Chlorpyrifos | Diazinon | Dichlorovos | Dimethoate | Ethion | Fenitrothion | Malathion | Parathion | Methyl Parathion | Other OPP                    | Aroclor 1242 | Aroclor 1254 | Other PCB | Phenol | 2,4,6-Trichlorophenol | 2,4-Dinitrophenol | 4-Nitrophenol | 2,3,4,6-Tetrachlorophenol | Pentachlorophenol | 2-Chlorophenol | 2,4-Dimethylphenol | 2,4-Dichlorophenol | 2,6-Dichlorophenol | 2-Methylphenol (O-Cresol) | Other Phenols |           |  |  |  |
| AEC31ABH01                                                     | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <PQL          |           |  |  |  |
| BD1/20230213                                                   | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <1            | <PQL      |  |  |  |
| Intra-laboratory Replicate                                     | Difference  | 0                         | 0        | 0               | 0               | 0                | 0      | 0            | 0             | 0      | 0          | 0            | 0       | 0                           | 0               | 0               | 0            | 0        | 0           | 0          | 0      | 0            | 0         | 0         | 0                | 0                            | 0            | 0            | 0         | 0      | 0                     | 0                 | 0             | 0                         | 0                 | 0              | 0                  | 0                  | 0                  | 0                         | 0             |           |  |  |  |
|                                                                | RPD         | 0%                        | 0%       | 0%              | 0%              | 0%               | 0%     | 0%           | 0%            | 0%     | 0%         | 0%           | 0%      | 0%                          | 0%              | 0%              | 0%           | 0%       | 0%          | 0%         | 0%     | 0%           | 0%        | 0%        | 0%               | 0%                           | 0%           | 0%           | 0%        | 0%     | 0%                    | 0%                | 0%            | 0%                        | 0%                | 0%             | 0%                 | 0%                 | 0%                 | 0%                        | 0%            |           |  |  |  |
|                                                                |             |                           |          |                 |                 |                  |        |              |               |        |            |              |         |                             |                 |                 |              |          |             |            |        |              |           |           |                  |                              |              |              |           |        |                       |                   |               |                           |                   |                |                    |                    |                    |                           |               |           |  |  |  |
| AEC31ABH02                                                     | 13/02/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <1            | <PQL      |  |  |  |
| BD2/20230213                                                   | 13/02/2023  | <0.2                      | <0.2     | <0.2            | <0.2            | <PQL             | <0.2   | <0.2         | <0.2          | <0.2   | <0.2       | <0.2         | <PQL    | <2                          | <2              | <2              | <2           | <2       | <2          | <2         | <2     | <2           | <2        | <2        | <PQL             | <1                           | <1           | <PQL         | <3        | <10    | <30                   | <10               | <PQL          | <10                       | <3                | <3             | <3                 | <3                 | <3                 | <3                        | <3            | <PQL      |  |  |  |
| Inter-laboratory Replicate                                     | Difference  | 0                         | 0        | 0               | 0               | 0                | 0      | 0            | 0             | 0      | 0          | 0            | 0       | 0                           | 0               | 0               | 0            | 0        | 0           | 0          | 0      | 0            | 0         | 0         | 0                | 0                            | 0            | 0            | 0         | 0      | 0                     | 0                 | 0             | 0                         | 0                 | 0              | 0                  | 0                  | 0                  | 0                         | 0             |           |  |  |  |
|                                                                | RPD         | 0%                        | 0%       | 0%              | 0%              | 0%               | 0%     | 0%           | 0%            | 0%     | 0%         | 0%           | 0%      | 0%                          | 0%              | 0%              | 0%           | 0%       | 0%          | 0%         | 0%     | 0%           | 0%        | 0%        | 0%               | 0%                           | 0%           | 0%           | 0%        | 0%     | 0%                    | 0%                | 0%            | 0%                        | 0%                | 0%             | 0%                 | 0%                 | 0%                 | 0%                        | 0%            | 0%        |  |  |  |
|                                                                |             |                           |          |                 |                 |                  |        |              |               |        |            |              |         |                             |                 |                 |              |          |             |            |        |              |           |           |                  |                              |              |              |           |        |                       |                   |               |                           |                   |                |                    |                    |                    |                           |               |           |  |  |  |
| AEC31ASW1                                                      | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <1            | <b>3</b>  |  |  |  |
| BD2/20230124                                                   | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <1            | <PQL      |  |  |  |
| Intra-laboratory Replicate                                     | Difference  | 0                         | 0        | 0               | 0               | 0                | 0      | 0            | 0             | 0      | 0          | 0            | 0       | 0                           | 0               | 0               | 0            | 0        | 0           | 0          | 0      | 0            | 0         | 0         | 0                | 0                            | 0            | 0            | 0         | 0      | 0                     | 0                 | 0             | 0                         | 0                 | 0              | 0                  | 0                  | 0                  | 0                         | 0             | 2         |  |  |  |
|                                                                | RPD         | 0%                        | 0%       | 0%              | 0%              | 0%               | 0%     | 0%           | 0%            | 0%     | 0%         | 0%           | 0%      | 0%                          | 0%              | 0%              | 0%           | 0%       | 0%          | 0%         | 0%     | 0%           | 0%        | 0%        | 0%               | 0%                           | 0%           | 0%           | 0%        | 0%     | 0%                    | 0%                | 0%            | 0%                        | 0%                | 0%             | 0%                 | 0%                 | 0%                 | 0%                        | 0%            | -         |  |  |  |
|                                                                |             |                           |          |                 |                 |                  |        |              |               |        |            |              |         |                             |                 |                 |              |          |             |            |        |              |           |           |                  |                              |              |              |           |        |                       |                   |               |                           |                   |                |                    |                    |                    |                           |               |           |  |  |  |
| AEC31ASW2                                                      | 24/01/2023  | <0.01                     | <0.01    | <0.01           | <0.01           | <PQL             | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL    | <0.02                       | <0.2            | <0.01           | <0.01        | <0.2     | <0.15       | <0.2       | <0.2   | <0.05        | <0.01     | <0.2      | <PQL             | <0.1                         | <0.1         | <PQL         | <1        | <1     | <20                   | <20               | <1            | <5                        | <1                | <1             | <1                 | <1                 | <1                 | <1                        | <1            | <PQL      |  |  |  |
| BD3/30230124                                                   | 24/01/2023  | <0.2                      | <0.2     | <0.2            | <0.2            | <PQL             | <0.2   | <0.2         | <0.2          | <0.2   | <0.2       | <0.2         | <PQL    | <2                          | <2              | <2              | <2           | <2       | <2          | <2         | <2     | <2           | <2        | <2        | <PQL             | <1                           | <1           | <PQL         | <3        | <10    | <30                   | <10               | <PQL          | <10                       | <3                | <3             | <3                 | <3                 | <3                 | <3                        | <3            | <b>20</b> |  |  |  |
| Inter-laboratory Replicate                                     | Difference  | 0                         | 0        | 0               | 0               | 0                | 0      | 0            | 0             | 0      | 0          | 0            | 0       | 0                           | 0               | 0               | 0            | 0        | 0           | 0          | 0      | 0            | 0         | 0         | 0                | 0                            | 0            | 0            | 0         | 0      | 0                     | 0                 | 0             | 0                         | 0                 | 0              | 0                  | 0                  | 0                  | 0                         | 0             | 19        |  |  |  |
|                                                                | RPD         | 0%                        | 0%       | 0%              | 0%              | 0%               | 0%     | 0%           | 0%            | 0%     | 0%         | 0%           | 0%      | 0%                          | 0%              | 0%              | 0%           | 0%       | 0%          | 0%         | 0%     | 0%           | 0%        | 0%        | 0%               | 0%                           | 0%           | 0%           | 0%        | 0%     | 0%                    | 0%                | 0%            | 0%                        | 0%                | 0%             | 0%                 | 0%                 | 0%                 | 0%                        | 0%            | -         |  |  |  |

Notes:  
PQL Practical Quantitation Limit  
- not defined/ not analysed/ not applicable  
\* May be adjusted for hardness  
NL Not Limiting  
BD1/20230213 Intra-lab replicate from AEC31ABH01  
BD2/20230213 Inter-lab replicate from AEC31ABH02

Table J5: Trip Blank Results - Water (µg/L)

| Sample ID | Benzene | Toluene | Ethylbenzene | o-Xylene | m+p-Xylene |
|-----------|---------|---------|--------------|----------|------------|
| TB-130223 | <1      | <1      | <1           | <1       | <2         |
| TB-240123 | <1      | <1      | <1           | <1       | <2         |

Table J6: Trip Spike Results – Water (% Recovery)

| Sample ID | Benzene | Toluene | Ethylbenzene | o-Xylene | m+p-Xylene |
|-----------|---------|---------|--------------|----------|------------|
| TS-130223 | 118     | 120     | 120          | 116      | 119        |
| TS-240123 | 113     | 113     | 119          | 115      | 115        |

Table J7: Rinsate Results - Water (µg/L)

|           |               | Metals  |         |                |        |      |                     |        |      | TRH          |              |              |              | BTEX    |         |              |          |            | PAH         |            |              |                |              |           | OCP    |          |                 |                 |        |              |               |        |            |              |           |
|-----------|---------------|---------|---------|----------------|--------|------|---------------------|--------|------|--------------|--------------|--------------|--------------|---------|---------|--------------|----------|------------|-------------|------------|--------------|----------------|--------------|-----------|--------|----------|-----------------|-----------------|--------|--------------|---------------|--------|------------|--------------|-----------|
|           |               | Arsenic | Cadmium | Total Chromium | Copper | Lead | Mercury (inorganic) | Nickel | Zinc | TRH C6 - C10 | TRH >C10-C16 | TRH >C16-C34 | TRH >C34-C60 | Benzene | Toluene | Ethylbenzene | o-xylene | m+p-xylene | Naphthalene | Anthracene | Fluoranthene | Benzo(a)pyrene | Phenanthrene | Other PAH | Aldrin | Dieldrin | gamma-Chlordane | alpha-Chlordane | pp-DDT | Endosulfan I | Endosulfan II | Endrin | Heptachlor | Methoxychlor | Other OCP |
| Sample ID | Sampling Date | µg/L    | µg/L    | µg/L           | µg/L   | µg/L | µg/L                | µg/L   | µg/L | µg/L         | µg/L         | µg/L         | µg/L         | µg/L    | µg/L    | µg/L         | µg/L     | µg/L       | µg/L        | µg/L       | µg/L         | µg/L           | µg/L         | µg/L      | µg/L   | µg/L     | µg/L            | µg/L            | µg/L   | µg/L         | µg/L          | µg/L   | µg/L       | µg/L         | µg/L      |
| RINS01    | 13/02/2023    | <1      | <0.1    | <1             | <1     | <1   | <0.05               | <1     | <1   | <10          | <50          | <100         | <100         | <1      | <1      | <1           | <1       | <2         | <0.02       | <0.01      | <0.01        | <0.01          | <0.01        | <PQL      | <0.01  | <0.01    | <0.01           | <0.01           | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL      |
| AECRINS01 | 24/01/2023    | <1      | <0.1    | <1             | <1     | <1   | <0.05               | <1     | <1   | <10          | 55           | <100         | <100         | <1      | <1      | <1           | <1       | <2         | <0.02       | <0.01      | <0.01        | <0.01          | <0.01        | <PQL      | <0.01  | <0.01    | <0.01           | <0.01           | <0.006 | <0.01        | <0.01         | <0.01  | <0.01      | <0.01        | <PQL      |

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## **Appendix K**

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Site Photographs



Photograph 1 - Waste and drum storage area



Photograph 2 - Waste and drum storage area

|                                                                                                                                                                       |                                                                                    |  |                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--|--------------------|
|  <b>Douglas Partners</b><br><small>Geotechnics   Environment   Groundwater</small> | <b>Site Photographs - AEC31a</b>                                                   |  | PROJECT: 204814.01 |
|                                                                                                                                                                       | <b>Sydney Metro Western Sydney Airport - SCAW, Sweetwater Grove, Orchard Hills</b> |  | PLATE No: 1        |
|                                                                                                                                                                       |                                                                                    |  | REV: 0             |
|                                                                                                                                                                       | CLIENT: CPBUI JV                                                                   |  | DATE: 2-Mar-23     |



Photograph 3 - Surface Water (AEC31ASW1)



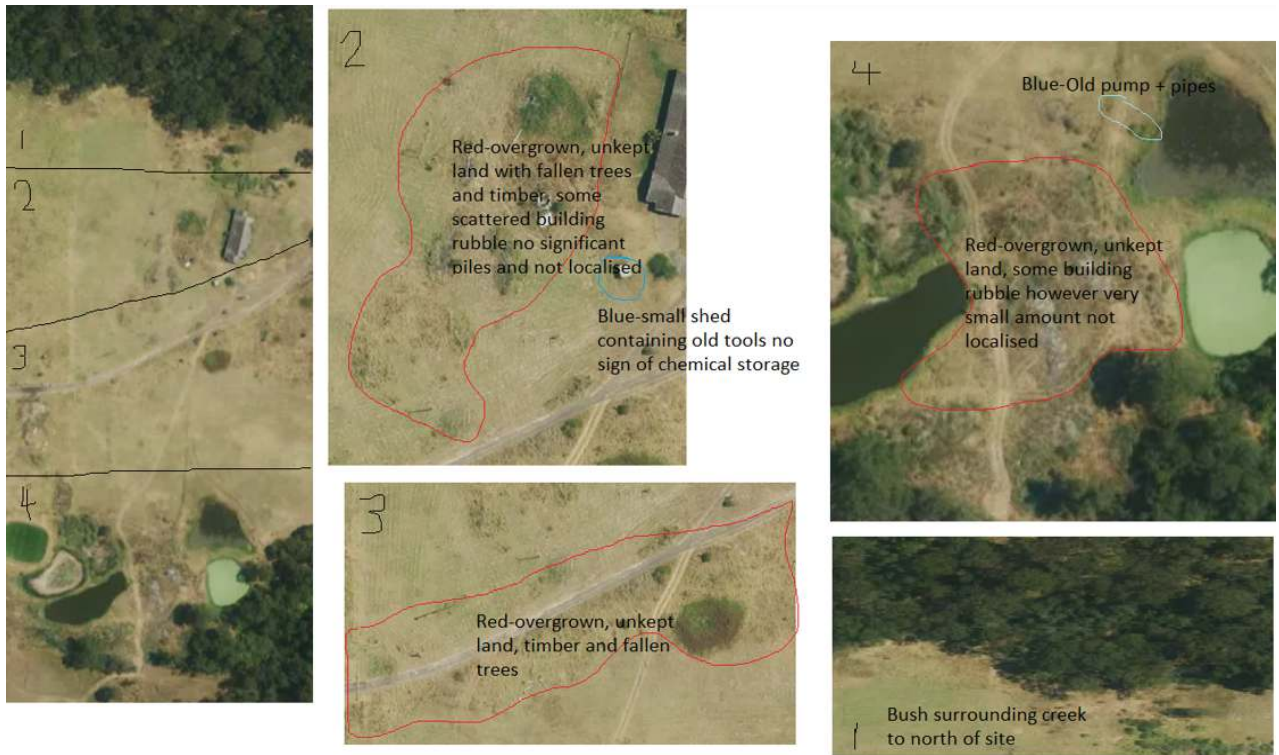
Photograph 4 - Surface Water (AEC31ASW2)



Photograph 5 - Surface Water (AEC31ASW3)



Photograph 6 - Surface Water (AEC31ASW4)



Photograph 7 - Current Site Condition