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LANE COVE DEVELOPMENTS NO. 1 PTY LTD

Hydrogeological Report including Dewatering Management Plan and Groundwater Seepage Analysis

300 Burns Bay Road, Lane Cove, NSW

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TABLE OF CONTENTS

Page Number

1. INTRODUCTION 1
1.1 Purpose 1
1.2 Site Description 2
1.3 Secretary's Environmental Assessment Requirements 3
1.4 Overview of Proposed Development 3
1.5 Report Objectives 4
1.6 Scope of Work 4
1.7 Regulatory Framework 5

2. SITE DESCRIPTION 6
2.1 Property Identification, Location and Physical Setting 6
2.2 Surrounding Land Use 6
2.3 Regional Setting 7
2.4 Local Groundwater Use 7
2.5 Potential Sources of Contamination 8
2.6 Potential Environmental Receptors 8
2.7 Groundwater Dependent Ecosystems 8

3. GROUNDWATER CONDITIONS 9
3.1 Previous Investigations 9
3.2 Conceptual Hydrogeological Model 9
3.3 Groundwater Depth and Hydraulic Gradient 9
3.4 Baseline Groundwater Quality Assessment 10
3.4.1 Sampling, Analytical and Quality Plan 10
3.4.2 Groundwater Sampling Methodology 11
3.4.3 Tested Parameters 12
3.4.4 Assessment Criteria 12
3.4.5 Field-based Water Quality Testing and Observations 13
3.4.6 Laboratory Analytical Results 13
3.4.7 Water Treatment Requirements 14

4. DEWATERING METHODOLOGY 15
4.1 Excavation and Shoring 15
4.2 Estimated Groundwater Take Volume 15
4.3 Dewatering Level and Drawdown Monitoring 15
4.4 Dewatering Method 16
4.4.1 Construction Phase Dewatering 16
4.4.2 Operational Phase Dewatering 16
4.5 Discharge Flow and Volume Monitoring 17
4.6 Potential Drawdown-Induced Impacts 17

5. WATER QUALITY MANAGEMENT 18
5.1 Responsibility 18

5.2 Discharge Water Quality Guidelines 18
5.3 Additional Pre-dewatering Monitoring Event 20
5.4 Discharge Water Quality Monitoring 21
5.4.1 Visual and Odour Monitoring 21
5.4.2 Sample Collection and Analysis 21
5.4.3 Reporting of Water Quality Results 22
5.5 Water Treatment 23
5.5.1 Treatment System Design 23
5.5.2 Treatment System Maintenance 23
5.6 Reporting of Dewatering Information 23
5.6.1 Interim Report - Construction Dewatering 23
5.6.2 Annual Reporting for Operational Dewatering 24
5.6.3 Dewatering Completion Report 24
6. SITE MANAGEMENT AND CONTROLS 25
6.1 Deviations from this Plan 25
6.2 Contact Details for Key Personnel 25
6.3 Summary of Specific Activities 25
6.4 Vibration, Noise, and Odour Management 26
6.5 Dewatering Contingencies 26
7. MINIMAL HARM ASSESSMENT 29
7.1 Consideration of NSW Aquifer Interference Policy 29
7.1.1 Hydrogeological Model Summary 29
7.1.2 Groundwater Source Category 29
7.1.3 Minimal Impact Considerations 29
7.1.4 Impact Assessment Conclusions 30
7.2 Assessment Inputs 30
7.3 Operational (Occupational) Phase Dewatering Management 31
7.3.1 Monitoring and Reporting 31
7.3.2 Monitoring Well Replacement Protocol 32
8. DEWATERING MANAGEMENT SUMMARY 33
9. STATEMENT OF LIMITATIONS 34
10. REFERENCES 35

APPENDICES

APPENDIX A – FIGURES

APPENDIX B – TABLES

APPENDIX C – PLANS OF THE PROPOSED DEVELOPMENT

APPENDIX D – RESULTS FROM THE REGISTERED BORE SEARCH

APPENDIX E – GROUNDWATER SEEPAGE ANALYSIS AND GROUNDWATER LEVEL MONITORING REPORT NO. 1

APPENDIX F – MONITORING BORE LOGS

APPENDIX G – LABORATORY DOCUMENTATION

APPENDIX H – QA/QC ASSESSMENT

APPENDIX I – DCR AND WORKS SURRENDER FORM

1. INTRODUCTION

This Hydrogeological Report including Dewatering Management Plan and Groundwater Seepage Analysis prepared by EI Australia (EI) on behalf of Lane Cove Developments No. 1 Pty Ltd ('the Applicant') supports an Early works State Significant Development Application (SSDA) (SSD-100293708) being lodged with the Department of Planning, Housing and Infrastructure (DPHI) for the demolition of all existing buildings and structures, excavation, augmentation of existing services and ground works at 300 Burns Bay Road, Lane Cove (the site) to enable the proposed redevelopment of the site for a residential development.

The proposal aims to:

- Facilitate the early works required for Ministerial declared HDA site under SSD-87925706, which will result in the construction of 225 dwellings.
- Enable the demolition, excavation and ground works to ensure the site is suitable for development of a residential development.
- Ensure the expedient delivery of the HDA application at the site (SSD-87925706), as per the requirements of the HDA approval pathway.

On 26 May 2025, the Housing Delivery Authority (HDA) recommended the proposed development for the purpose of residential flat building development including the construction of circa 225 dwellings at 300 Burns Bay Road, Lane Cove be declared a State Significant Development (SSD) under s4.36(3) of the Environmental Planning and Assessment Act 1979 (EP&A Act). The main works SSD (Ref. SSD-87925706) will be lodged imminently with DPHI, with exhibition anticipated to commence in March 2026. This Early Works SSD is intended to facilitate the delivery of this residential flat building development through the following proposed works:

- Site establishment works including:
  - Erection of site hoarding, fencing and signage;
  - Installation of site office and amenities.
- The demolition of all existing structures at the site comprising:
  - Office Building
  - Warehouse
  - Car Parking structure
- Removal of 32 trees on the site;
- Shoring and bulk excavation works to enable the excavation of basement levels; and
- Extension and augmentation of services and infrastructure as required.

1.1 Purpose

The site is designated for residential redevelopment, the proposed apartment building to include a two to three level (drained) basement. As bulk excavation for the basement will intersect the local groundwater table, site dewatering shall be necessary

To facilitate the management of groundwater during basement construction, local hydrogeological conditions must be characterised. This hydrogeological report subsequently includes the following:

- Determination of baseline (pre-dewatering) groundwater levels and quality (**Section 3** and **Appendix B**);
- Review of groundwater level monitoring and seepage analysis reports (**Sections 3-4**, inclusive);
- Drafting of a dewatering management plan (DMP; **Sections 4-6**, inclusive); and
- Minimal harm assessment, which considers the predicted cumulative drawdown and water quality effects from long term dewatering against the *New South Wales Aquifer Interference Policy 2012* (AIP; **Section 7**).

The purpose of the DMP is to describe site-specific measures for the management of surface and groundwater during basement construction. It is assumed that all water draining into the excavation area will be treated prior to discharge into the local, municipal stormwater system.

This report is submitted in support of applications to Lane Cove Municipal Council for a permit to discharge into the stormwater network and to WaterNSW for a water supply works (dewatering) license. It is understood that WaterNSW may not fully assess the dewatering license application until Council issues the stormwater discharge permit. To facilitate the approval process however, this DMP is issued concurrently to WaterNSW and Council.

1.2 Site Description

The site is irregular in shape and is legally described as Lot 15 DP 1230609, and has a site area of 7,595m^2. The site is located on the eastern side of the roundabout intersection between Burns Bay Road and Waterview Drive. Existing development on the site comprises an existing four (4) storey office building and warehouse, which is predominately sited on the eastern portion of the site

An aerial of the site illustrated in **Figure 1**.

Figure 1 Site Aerial (highlighted in red)
Source: Source: Nearmap / Colliers Urban Planning

1.3 Secretary's Environmental Assessment Requirements

In accordance with section 4.39 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), Secretary's Industry-specific Housing Environmental Assessment Requirements (SEARs) (SSD-100293708) (Early Works SSDA) have been issued on 15 December 2025. Email correspondence was shared with DPHI officers to review and agree the relevant SEARs deliverables which would be necessary for the Early Works SSD. The SEARs outlined below reflect the SEARs requirements agreed with DPHI.

This report has been prepared to respond to the issued SEARs, as set out in the table below.

Table 1-1 Secretary's Environmental Assessment Requirements relevant to this report

SEARS	Issue and Assessment Requirements	SEARs Scope Agreed with DPHI	Report Name and Section
Ground and Groundwater Conditions	*Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site and including soil erosion.* *Where required provide a Groundwater Impact Assessment in accordance with relevant Groundwater Guidelines. If the proposed development is on land* *identified as having high salinity or acid sulfate soil potential in an EPI provide a Salinity Management Plan or Acid Sulfate Soil Management Plan that includes appropriate management measures and strategies.*	Hydrogeological Report and Groundwater Seepage Analysis will be submitted with the Early Works SSD.	**Hydrogeological Report and Groundwater Seepage Analysis** Groundwater Results – **Section 3.4.6** Groundwater Impact Assessment – **Section 4.3** GSA – **Appendix D**

1.4 Overview of Proposed Development

This SSDA (Ref. SSD-100293708) seeks approval for early works associated with the delivery of the residential development of the site under SSD-87925706 at 300 Burns Bay Road, Lane Cove. This SSD comprises the following proposed development:

- Site establishment works including:
  - Erection of site hoarding, fencing and signage;
  - Installation of site office and amenities.

- The demolition of all existing structures at the site comprising:
  - Office Building
  - Warehouse
  - Car Parking structure
- Removal of 32 trees on the site;
- Shoring and bulk excavation works to enable the excavation of basement levels; and
- Extension and augmentation of services and infrastructure as required.

Architectural drawings are presented in **Appendix C**.

1.5 Report Objectives

The objectives of this report are to:

- Describe the conceptual hydrogeological model (CHM) for the site and summarise baseline groundwater conditions, including pre-dewatering groundwater depth and groundwater quality;
- Summarise relevant hydrogeological modelling information, with reference to the previous groundwater level monitoring (GLM) and groundwater seepage analysis (GSA);
- Describe the dewatering methodology, as well as the groundwater treatment requirements, monitoring and reporting procedures to be employed during the construction phase;
- Provide effective management and contingency procedures, to ensure that dewatering discharge does not pose unacceptable risks to the receiving environment, in compliance with the *Protection of the Environment Operations Act 1997*;
- Detail post-construction monitoring and reporting procedures for the occupational phase of the development; and
- Provide relevant information on anticipated groundwater impacts, with reference to the AIP, to properly inform the regulatory approval process.

1.6 Scope of Work

In order to achieve the stated objectives, the following scope of work is herein completed:

- A desktop study including:
  - Review of the development proposal;
  - Review of geological, landscape and acid sulfate soils (ASS) risk maps for the area;
  - Review Council development consent and WaterNSW requirements to determine the generic and site specific conditions placed on the development relevant to the dewatering process;
  - A search of government records for previously installed registered bores located within a 500m radius of the site to review local groundwater usage;
  - Review of previous environmental and geotechnical investigation reports to identify potential onsite and offsite sources of contamination that may impact on dewatering discharge water quality;
  - Review of existing reports and laboratory analytical data obtained during a groundwater monitoring event (GME) to characterise baseline groundwater quality; and

  - Review of a groundwater seepage analysis (GSA), which included computer modelling for the assessment of groundwater inflow volumes, predicted drawdown effects and drawdown-induced ground settlement in response to construction dewatering; and
- Data analysis and report preparation.

1.7 Regulatory Framework

The following regulatory instruments and guidelines provided the framework for this report.

Table 1-2 Regulatory Framework

NSW Regulatory Instrument	Requirements / Objectives
Contaminated Land Management Act 1997 (CLM Act)	Promotes the effective management of contaminated land in NSW by setting out the roles and responsibilities of the EPA and its rules.
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act stipulates the regulations and gives rise to state environmental planning policy (SEPP) to assist regulators with the protection of human and environmental health.
Protection of the Environment Operations Act 1997 (POEO Act)	The objective of the *POEO Act* is to achieve the protection, restoration and enhancement of the quality of the environment.
NSW Water Management (General) Regulation 2018	Details relating to water access license requirements.
Water Management Act 2000 and *Water Act 1912*	Protects the health of rivers, streams and groundwater systems and gives rise to water sharing plans and quality objectives for catchments within the state of NSW. Manages aquifer interference activities which involve: ▪ The penetration of an aquifer; ▪ The interference of water in an aquifer; ▪ The obstruction of water flow or taking of water from an aquifer when carrying out prescribed activities; and ▪ The disposal of water taken from an aquifer.
New South Wales Aquifer Interference Policy 2012	Details the scope of aquifer interference activities, minimal impact assessment and provides specific guidance on the licensing and approval requirements for activities that interfere with aquifers.
Lane Cove Municipal Council Plans and Policies	Provides controls and guidelines for development in the area, via: ▪ *Lane Cove Development Control Plan 2010; and* ▪ *Lane Cove Local Environmental Plan 2009.* Note: For projects involving site dewatering, Council typically requires details for the proposed water disposal connection to the stormwater system, preferably in the form of engineering drawings and plans.
Relevant Guidelines	ANZG (2018) *Guidelines for Fresh and Marine Water Quality* ANZECC / ARMCANZ (2000) *Guidelines for Fresh and Marine Water Quality* DPIE (2022) *Minimum Requirements for Building Site Groundwater Investigations and Reporting* NHMRC (2008) *Guidelines for Managing Risks in Recreational Water* DEC (2007) *Guidelines for the Assessment and Management of Groundwater Contamination*

2. SITE DESCRIPTION

2.1 Property Identification, Location and Physical Setting

Site identification details and associated information are summarised in **Table 2-1**. Site locality and layout plans are provided in **Appendix A**. Refer also to **Appendix C** for site plans.

Table 2-1 Site Identification, Location and Zoning

Information	Detail
Site Address	300 Burns Bay Road, Lane Cove
Location Description	Bound by Burns Bay Road to the west, Hartman Hill Reserve to the north, Lane Cove River to the south, and Burns Bay Reserve to the east.
Cadastral Identification	Lot 15 in DP 1230609
LGA	Lane Cove Council
Zoning	R4 – High Density Residential (*Lane Cove Local Environment Plan 2009*)
Current Site Use	At the time of drafting this report, the property was occupied by a two storey, vehicle parking facility, a four storey, brick building, a tennis court and an open, part suspended / part at-grade, asphalt-surfaced parking area.
Location Coordinates	North-western corner of the site (under GDA2020-MGA56): Easting: 328885.711 Northing: 6256215.309 (Source: https://maps.six.nsw.gov.au/)
Site Area	7,595m^2

2.2 Surrounding Land Use

Land uses within close proximity (<250m) to the site are identified in **Table 2-2**.

Table 2-2 Local Land Use

Direction	Land Use Description
North	Burns Bay Road, followed by Hartman Hill Reserve
South	Burns Bay Reserve, followed by Kooyong Road
East	Residential properties, followed by Caroline Chisholm Lane
West	Residential properties, followed by Lane Cove River

2.3 Regional Setting

The regional setting, including ground surface topography, (hydro)geology, landscape and acid sulphate soils, is summarised in **Table 2-3**. Refer also to **Appendix C** for site plans.

Table 2-3 Regional Setting Information

Attribute	Description
Topography	The site downslopes southeast, from a relative level of 26m AHD in the north western corner, to 16m AHD in the south eastern portion.
Drainage	Likely to be consistent with the general slope of the site. Stormwater to be collected in pits and piped to the municipal collection system. Heavier runoff might cause stormwater to flow in a south-westerly direction towards Tannery Creek.
Geology	The DMR (1983) *Sydney 1:100,000 Geological Series Sheet 9130* (DMR, 1983) indicates the site is underlain by Hawkesbury Sandstone (*Rh*), consisting of medium to coarse grained quartz sandstone, minor shale and laminate lenses.
Soil Landscape	According to the DCCEEW (2024) *eSPADE v2.2 Portal*, the site overlies a Hawkesbury landscape. This landscape is characterised by undulating to rolling low hills on Wianamatta Group shales and sandstones.
Acid Sulfate Soil (ASS) Risk	With reference to the *Lane Cove Local Environmental Plan 2009 - Acid Sulfate Soils Map*, the site is not classified. According to the *Prospect / Parramatta River Acid Sulfate Soil Risk Map* (1:25,000 scale; Murphy, 1997), the subject land lies within an area having *No Known Occurrence*. In such cases, ASS is not known or expected to occur and "land management activities are not likely to be affected by ASS materials". Based on the map information, as well as the site's relative elevation (16-26m AHD), the potential for ASS to be present on-site was considered to be low and further related assessment was deemed unwarranted.
Nearest Surface Water Features	Tannery Creek, approximately 50m south east of the site, which flows to Lane Cove River, approximately 820m south of the site.
Groundwater Flow Direction	Anticipated to be south east, towards Tannery Creek.

2.4 Local Groundwater Use

An online search for groundwater bores registered with WaterNSW was conducted by EI on 31 June 2025 (https://realtimedata.waternsw.com.au/water.stm). The search identified five registered groundwater bores within 500m radius of the site. All five bores, originally authorised for monitoring purposes, were located north to north west of the site (**Table 2-4**).

It was concluded that the local groundwater resource was not being heavily utilised for beneficial (domestic, irrigation or commercial purposes). Refer to **Appendix D** for the bore location plan and archived record (driller's log) sheets.

Table 2-4 Summary of Registered Groundwater Bores within 500m of the site

Bore	Date Drilled	Distance and Direction from Site (m)	Depth (m BGL)	SWL (m BGL)	Purpose
GW202406	27/08/2010	110m north west	6.0	2.1	Monitoring
GW114976	07/06/2011	390m north	8.3	-	Monitoring
GW114975	07/06/2011	390m north	7.3	-	Monitoring
GW114973	08/06/2011	295m north	8.5	2.77	Monitoring
GW114974	08/06/2011	410m north	8.5	-	Monitoring

2.5 Potential Sources of Contamination

Potential sources of groundwater contamination are:

- Previous on-site commercial activities;
- Imported fill materials of unknown origin and quality, used for site levelling;
- Weathering and uncontrolled demolition of building fabrics containing hazardous substances, including asbestos-containing materials (ACMs), lead-based paints and metallic surfaces;
- Underground storage of fuel;
- Leakage from vehicles in parking areas;
- Application of pesticides beneath the building footprints and around footings; and
- Migration of contaminants from neighbouring, up- and cross- gradient commercial properties.

2.6 Potential Environmental Receptors

Surface runoff and groundwater migrating from the site are expected to drain into Tannery Creek. Tannery Creek flows into Burns Bay, which is part of the Lane Cove River.

As documented in the NSW Government (2006) *Department of Natural Resources Survey of Tidal Limits and Mangrove Limits in NSW Estuaries 1996 to 2005*, the corresponding sections of Tannery Creek and the Lane Cove River are tidally influenced, making them marine ecosystems

2.7 Groundwater Dependent Ecosystems

A search of Table D in the *NSW Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023 - Schedule 4* was conducted on 31 March 2025. Tannery Creek was not listed as, and did not exist within close proximity to, a groundwater dependent ecosystem (GDE).

3. GROUNDWATER CONDITIONS

3.1 Previous Investigations

Information from the following investigation reports provided an understanding of the hydrogeological conditions at the site:

- EI (2024a) *Geotechnical Investigation; 300 Burns Bay Road, Lane Cove, NSW* (EI Australia Reference E26484.G03_Rev0, dated 18 October 2024);
- EI (2024b) *Groundwater Monitoring Event; 300 Burns Bay Road, Lane Cove, NSW* (EI Australia Reference E26484.E17_Rev0, dated 5 November 2024);
- EI (2024c) *Preliminary Site Investigation; 300 Burns Bay Road, Lane Cove, NSW* (EI Australia Reference E26484.E01_Rev0, dated 7 November 2024);
- EI (2025a) *Groundwater Level Monitoring Report No.1; 300 Burns Bay Road, Lane Cove, NSW* (EI Australia Reference E26484.G11.GW01, dated 9 July 2025); and
- EI (2025b) *Groundwater Seepage Analysis; 300 Burns Bay Road, Lane Cove, NSW* (EI Australia Reference E26484.G12_Rev2, dated 10 December 2025.

The EI (2025b) *Groundwater Seepage Analysis* (GSA) is attached in **Appendix E**. The GSA provides site-specific groundwater modelling, including predicted water level drawdowns, groundwater inflow and discharge volumes, and ground settlement rates at varying distances from the basement excavation.

This modelling utilised groundwater level data derived from monitoring wells (piezometers) installed on the site by EI (BH1M, BH2M, BH3M and BH5M). Refer to **Appendix F** for the EI monitoring well logs. Monitoring well locations are illustrated in **Figure 2**, **Appendix A**.

3.2 Conceptual Hydrogeological Model

Based on a review of published hydrogeological data and the previous environmental investigations undertaken at the site, the CHM for the site is as follows:

- Subsurface soil profile:
  - Asphalt: up to 0.10m thickness; overlying
  - Anthropogenic, gravelly sand, silty sand and/or clayey sand fill: 0.10-2.3m thickness;
  - Natural (residual), silty clay: to 1.2-2.0m BGL; grading into
  - Weathered sandstone bedrock: to at least 15.12m BGL.
- On-site groundwater impacts included volatile organic compounds (VOCs), due to leather processing and tanning activities that were historically performed on the property.
- Groundwater flow is predominantly moving through the underlying sandstone bedrock, along bedding planes, joints and fractures.

3.3 Groundwater Depth and Hydraulic Gradient

EI commenced groundwater monitoring at the site on 18 September 2024, utilising the four wells (BH1M, BH2M, BH3M and BH5M). Details of the monitoring wells and rising head test results, from 26 September 2024, are presented in **Table 3-1**. The reduced water levels were determined using surveyed wellhead elevation data.

Table 3-1 Summary of Monitoring Well Details and Rising Head Test Results

Well	Well Depth (m BGL)	Screen Length (m)	Screened Section	Relative Level (RL) of Groundwater (m AHD)	Calculated Permeability (m/s)
BH1M	10.2	3	Sandstone	20.11	4.68×10^{-9}
BH2M	10.1	3	Sandstone	21.28	1.31×10^{-7}
BH3M	15.1	3	Sandstone	20.41	4.18×10^{-8}
BH5M	10.1	3	Sandstone	16.84	1.60×10^{-7}

Continuous groundwater level monitoring was conducted from 7 April to 8 July 2025. The maximum and minimum groundwater levels recorded during this period are given in **Table 3-2**.

Table 3-2 Summary of Continuous Groundwater Monitoring Results

Well	Ground Surface RL (m AHD)[1]	Average Groundwater RL (m AHD)[2]	Maximum Groundwater RL (m AHD)	Minimum Groundwater RL (m AHD)
BH1M	22.36	20.41	20.81	20.22
BH2M	22.68	21.46	21.65	21.34
BH3M	22.32	21.19	21.42	20.87
BH5M	22.11	16.77	16.96	16.68

Note 1 – The ground surface RL at each monitoring well was extrapolated from the ground elevation survey plan

Groundwater level data for monitoring wells BH1M, BH2M, BH3M and BH5M were extrapolated against surveyed spot elevations, to produce approximate wellhead levels in m AHD. This data was utilised for the analysis of hydraulic gradient and groundwater flow direction using the Surfer® software package. Groundwater level contours were manually smoothed to produce **Figure 3** in **Appendix A**. The analysis showed that:

- The water bearing (clay / sandstone) lithology displays low hydraulic conductivity. Hence, the aquifer generates low well yields, mostly through the fractured sandstone.
- The groundwater was inferred to be flowing in a south east direction, towards Tannery Creek, under a hydraulic gradient of 0.027 (based on maximum level data) and 0.030 (based on minimum level data).
- For the GSA, design groundwater levels of 21.9m AHD and 17.0m AHD were adopted for estimation of groundwater seepage inflow rates and volumes within the basement excavation. These values were conservatively set at 0.5m above the highest record level to allow for potential seasonal groundwater level fluctuations.
- Site dewatering will primarily drain the residual clay soil and sandstone units.

3.4 Baseline Groundwater Quality Assessment

A GME, involving water level gauging, purging, measurement of physiochemical parameters and sampling at each of the four wells, was conducted on 18 September 2024. The aim of this GME was to establish baseline groundwater quality data.

3.4.1 Sampling, Analytical and Quality Plan

The sampling, analytical and quality plan (SAQP) for the baseline GME included the following measures, to ensure that the data collected were representative and provided a robust basis for future management decisions:

- Industry-endorsed sampling methodology, including field screening procedures, handling, preservation and storage;

- Laboratory analysis methods accredited by NATA;
- Data quality indicators (DQI) for the field and laboratory quality control samples; leading into
- Analytical quality assurance / quality control (QA/QC); and
- Appropriate water quality assessment criteria.

Refer to **Appendix G** for the laboratory documentation relating to the collected samples. Refer to **Appendix H** for the QA/QC assessment, which concluded that the field and laboratory analytical data for the baseline groundwater quality assessment were of an acceptable standard for interpretive use.

3.4.2 Groundwater Sampling Methodology

The groundwater sampling methodology followed during the GME is described in **Table 3-3**.

Table 3-3 Summary of Groundwater Sampling Methodology

Activity/Item	Details
Fieldwork	A single GME, involving water level gauging, well purging, measurement of physiochemical parameters and groundwater sampling was conducted on 18 September 2024. All four wells utilised (BH1M, BH2M, BH3M and BH5M).
Well Gauging	Monitoring wells were gauged to determine standing water level (SWL) prior to groundwater purging and sampling. Gauging was conducted with a water/oil interface probe.
Well Purging, Water Quality Measurements and Sampling	Groundwater was purged and sampled by low-flow / minimal draw-down method, using a peristaltic pump with dedicated tubing. During the purging process, continuous field measurements were obtained for water temperature (T), electrical conductivity (EC), reduction-oxidation potential (Redox), dissolved oxygen (DO) and pH, using a *Hanna Multi Parameter 9829* positioned within an open flow-through cell. Once water quality parameters stabilised (i.e. within ± 10% for DO, ± 3% for EC, ± 0.05 for pH, ± 0.2° for temperature and ± 20mV for Redox), the measured values were recorded. Groundwater sampling was then undertaken by diverting the outlet of the pump (immediately before the flow cell) to the sampling vials and bottles.
Decontamination Procedure	Sampling equipment (interface probe and water quality kit probes) were decontaminated between sampling locations by washing in a solution of potable water and *Decon 90*, followed by rinsing with potable water. Decontamination was not required for the sampling pump, as dedicated disposable tubing was used for sampling at each individual well. Dedicated gloves were used for the handling of equipment and collection of each sample.
Sample Preservation	Pre-preserved sample containers were supplied by the laboratory as follows: ▪ one, 1 litre amber glass, acid-washed and solvent-rinsed bottle; ▪ two, 40mL glass vials, pre-preserved with dilute hydrochloric acid and Teflon-sealed; ▪ one, 250mL, HDPE bottle, pre-preserved with dilute nitric acid (1mL); ▪ Additional bottles and preservatives were used for the more detailed suite of tested parameters, as listed and described in **Section 3.4.5**. Samples for metals analysis were field-filtered using 0.45 µm pore membranes. All containers were filled with sample to the brim then capped and stored in insulated chests (containing chilled ice bricks), until completion of the fieldwork and during sample transit to the laboratory.
Sample Transport	After sampling, the chilled chests were transported to SGS Pty Ltd (SGS; the primary laboratory) using strict COC procedures. Sample Receipt Advice (SRA) was provided by the laboratory to document sample condition upon receipt. Copies of the SRA and COC certificates are presented in **Appendix G**.

Activity/Item	Details
Quality Control, Laboratory Analysis and Sample Transport	Groundwater samples were analysed by SGS for the requested analytes as detailed on the COC form. All samples were analysed within the required holding period, as documented in the corresponding laboratory reports (included in **Appendix G**). In addition to an inter-laboratory duplicate sample (analysed by Envirolab Services Pty Ltd, the secondary laboratory), QC analyses comprised a blind (intra-laboratory) field duplicate, a laboratory-prepared, trip spike water sample and a laboratory-prepared, trip blank water sample, all analysed by SGS.

3.4.3 Tested Parameters

The groundwater sample from well BH3M was analysed for the *Baseline Suite*, which included:

- ***Physical Parameters:*** EC, pH, Redox, total dissolved solids (TDS), total hardness, dissolved oxygen (DO) and turbidity;
- ***Major Anions:*** sulfate, chloride, carbonates, bromide, fluoride;
- ***Major Cations*****:** calcium, magnesium, sodium, potassium;
- ***Ionic Balance:*** cation/anion balance (%);
- ***Dissolved Inorganics and Metals:*** aluminium, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silica, silver, strontium, uranium, vanadium and zinc;
- ***Nutrients:*** ammonia, nitrate, total nitrogen, oxidised nitrogen, total phosphorus and reactive phosphorus;
- ***Microbiological Organisms:*** Faecal coliforms, faecal *streptococci* and *Escherichia coli*; and
- ***Organics:*** Volatile organic compounds (VOCs; including chlorinated VOCs and the monocyclic aromatic hydrocarbons benzene, toluene, ethylbenzene and xylenes (BTEX)), polycyclic aromatic hydrocarbons (PAHs), total recoverable hydrocarbons (TRHs); plus
  - Total cyanide;
  - Total phenols; and
  - Per- and poly- fluoroalkyl substances (PFAS).

The groundwater samples from wells BH1M, BH2M and BH5M were analysed for the condensed *Standard Suite*, which included:

- ***Physical Parameters:*** pH, EC, TDS and total hardness;
- ***Dissolved Metals:*** aluminium, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc; and
- **Organics:** VOCs (including chlorinated VOCs and BTEX), PAHs, TRHs, total cyanide and total phenols.

3.4.4 Assessment Criteria

The ANZG (2018) *95% Default Guideline Values* were adopted as the assessment criteria, with the *99% Default Guideline Values* assumed for bio-accumulative toxicants (cadmium and mercury). For parameters that were not addressed by the ANZG (2018) guidelines, relevant alternative criteria were adopted. The criteria are presented alongside the analytical results in the corresponding summary tables (**Tables B1** and **B2** in **Appendix B**).

3.4.5 Field-based Water Quality Testing and Observations

Final (pre-sampling) measurements for the field water quality parameters DO, pH, EC, T and Redox are presented in **Table 3-4**. The groundwater samples were also evaluated on the basis of odour and visual signs of contamination, with the following observations noted:

- Groundwater was found to be pale yellow grey in colour, with high turbidity;
- The measured SWLs ranged between 1.22 and 5.22m BGL;
- No odours or visual evidence of contamination were detected during well purging or groundwater sampling; and
- No petrochemical films or oily sheens were observed on the surface of the purged / sampled groundwater.

The field measurements indicated that the groundwater was fresh (non-saline; EC: 647-806 µS/cm), acidic (pH: 5.33-6.54) and non-oxidising.

Table 3-4 Groundwater Field Data

Well	SWL (mBGL)	DO (mg/L)	pH	EC (µS/cm)	T (^{o}C)	Redox [1] (mV)
BH1M	1.98	0.35	6.54	806	17.79	193
BH2M	1.22	0.62	5.43	671	14.95	-217
BH3M	1.69	0.62	5.96	782	14.83	142
BH5M	5.22	0.43	5.33	647	15.68	-301

Redox readings were adjusted to the Standard Hydrogen Electrode potential by adding 205mV to field readings

3.4.6 Laboratory Analytical Results

Summaries of the field and laboratory analytical results for the baseline groundwater samples are presented in **Tables B1** and **Table B2** (**Appendix B**). The results were compliant with the adopted criteria, except as follows:

- Dissolved aluminium at monitoring wells BH2M (120 µg/L) and BH5M (120 µg/L);
- Dissolved chromium (2 µg/L) at monitoring well BH5M;
- Dissolved cobalt (4 µg/L) at monitoring well BH3M;
- Dissolved copper at monitoring wells BH1M (2 µg/L), BH2M (6 µg/L) and BH5M (3 µg/L);
- Dissolved zinc at monitoring wells BH1M (24 µg/L), BH2M (16 µg/L), BH3M (18 µg/L) and BH5M (18 µg/L);
- Total oxidised nitrogen (270 µg/L) at monitoring well BH3M;
- Total nitrogen (700 µg/L) at monitoring well BH3M;
- Total phosphorus (180 µg/L) at monitoring well BH3M;
- Laboratory pH values at monitoring wells BH1M (6.4), BH2M (5.4), BH3M (5.9) and BH5M (5.2), plus the field pH values at BH2M, BH3M and BH5M; and
- Turbidity at monitoring wells BH1M (99 NTU), BH2M (130 NTU), BH3M (780 NTU) and BH5M (120 NTU).

3.4.7 Water Treatment Requirements

It is understood that during basement excavation and construction, extracted groundwater will be discharged into the local municipal stormwater system. The data derived from the baseline quality assessment indicated that, prior to off-site discharge, all extracted groundwater will need to be pumped through a water treatment system. The water treatment shall need to:

- Reduce dissolved metals, in particular aluminium, chromium, cobalt, copper and zinc;
- Reduce total nitrogen and phosphorus nutrient levels;
- Elevate pH, to be within the range 6.5-8.0; and
- Reduce turbidity, to maintain below 50 NTU.

A potentially suitable treatment option may involve pumping tail water through a sediment settlement (baffle) tank, where the following could be implemented:

- pH correction via the addition of sodium hydroxide solution;
- Addition of flocculent/coagulant for settlement of suspended particles, which would lower turbidity; and
- Adjustment of the flow rate to allow sufficient residence time for flocculation/coagulation and settlement to take place.

A water treatment specialist should be engaged to advise on appropriate treatment technologies for the site groundwater. It would be appropriate to engage the water treatment specialist early, to allow sufficient time for the design of the water treatment system, prior to the start of dewatering.

A further GME will be performed before commencement of basement excavation, to verify groundwater quality and treatment requirements. Chromium speciation testing (i.e. chromium VI) shall be recommended for the proposed pre-dewatering GME. Further details on pre-dewatering quality monitoring are provided in **Section 5.3**.

Since a drained basement is to be installed under the proposed development, the assessment and monitoring data collated by the end of the construction phase dewatering will be used to inform the treatment requirement(s) during the subsequent operational phase (on-going / long-term) dewatering. Further details on water quality monitoring and management during the operational phase are provided in **Section 7.3**.

4. DEWATERING METHODOLOGY

4.1 Excavation and Shoring

The proposed development will include a two to three level (drained) basement. Excavation for the basement shall extend to 10m BGL, equating to a relative level of 11m AHD (allowing for the thickness of the corresponding, lower floor slab).

Shoring design details for the proposed excavation have not been provided. Under the EI (2025b) GSA, it was assumed that the excavation would be supported by a soldier pile wall, with the wall embedded to the proposed bulk excavation level. In the absence of detailed design, the shoring system was conservatively modelled as fully permeable in the finite element analysis. The GSA did not assess the overall stability and embedment depth of the shoring system. Once final designs are made available, this assessment will be revised accordingly.

4.2 Estimated Groundwater Take Volume

The EI (2025b) GSA modelled the volume (take) of groundwater seepage through and beneath the shoring wall during the basement construction. The groundwater entering the excavation beneath the shoring wall was estimated using the finite element seepage analysis software package *PLAXIS 2D*. PLAXIS 2D is intended for two dimensional analysis in geotechnical engineering. This package is capable of analysing various aspects of geotechnical structures and construction processes.

As the designed basement will be a draining structure, groundwater mounding was not a consideration for modelling purposes.

Based on a specific set of assumptions and field test data, which included design groundwater levels and layer-specific hydraulic conductivities (as detailed in the EI (2025b) GSA), groundwater seepage through and beneath the shored walls into the excavation area during basement construction is predicted to be (**Appendix E**):

- 4.8 megalitres per year (ML/year), based on an estimated inflow rate of 13 m^3/day for the soldier pile shoring wall.

This take estimate will also apply to the operational phase dewatering.

Note: In accordance with the *New South Wales Water Management (General) Regulation 2018*, the New South Wales Government has introduced a temporary water access licence exemption for coastal construction of buildings and infrastructure. This site is located within the greater metropolitan groundwater sources area and as such a water access licence is not required while dewatering is taking place during the construction phase.

4.3 Dewatering Level and Drawdown Monitoring

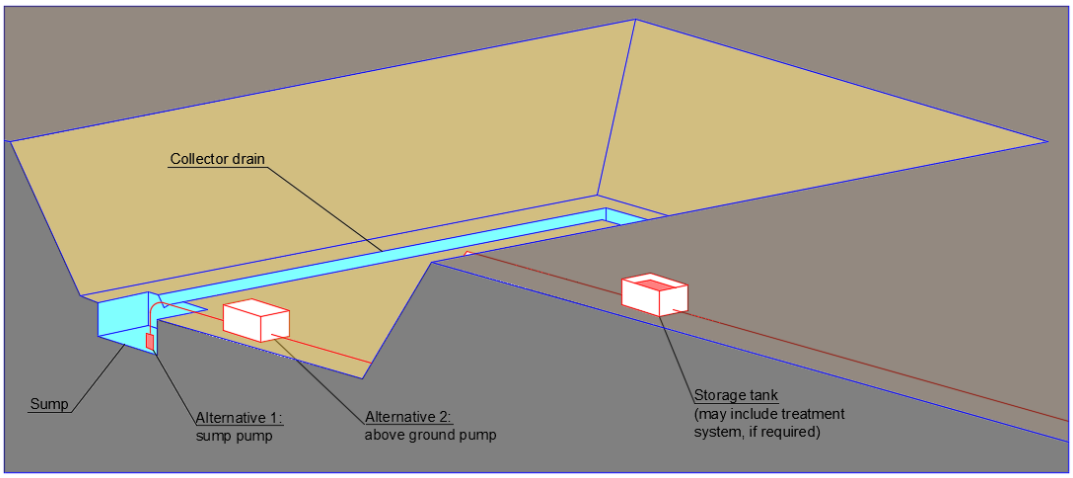
Based on the *PLAXIS 2D* modelling results (EI, 2025b), the predicted maximum groundwater drawdown surrounding the basement boundary is 5.3 m in Section A_A and 3.6m in Section B-B. The estimated maximum ground settlement surrounding the basement boundary is 0.7mm, which is deemed to pose ‘negligible’ risk in terms of the category of damage risk due to dewatering. Drawdown impacts from the dewatering activity are therefore unlikely to pose adverse impacts on neighbouring properties.

Groundwater elevations will be monitored periodically during the construction dewatering period, utilising selected monitoring wells. Groundwater depth monitoring may be adequately gauged by an electronic water contact meter.

4.4 Dewatering Method

Dewatering of saturated, sand clay aquifers is typically achieved by a perimeter network of spear point wells that are manifolded via a pumping arrangement that directs extracted water to a centralised treatment system. Lower yielding (fractured bedrock) aquifers, such as that which exists at this site, may involve a sump and pump system to control water seepage, as illustrated in **Figure 4-1**.

Figure 4-1 Hypothetical layout of a *Sump and Pump* seepage collection system



4.4.1 Construction Phase Dewatering

During construction, seepage water is to be collected and appropriately treated prior to discharge to the local municipal stormwater network. A collection sump is typically located at the lowest part of the excavation, from which collected seepage waters are pumped into a storage tank for sediment settling. The preferred tank type will require capacity to accommodate the predicted rate of groundwater seepage inflow, which was estimated as 13 m^3/day (**Section 4.2**).

Groundwater treatment will be undertaken either in the settling tank, or via a water treatment system installed close to the tank prior to discharge. The treated water will then be discharged into the municipal storm water pit provided that prior approval for discharge has been obtained from the relevant consent authority.

The pumping system may operate on a full time or intermittent basis (as required), for the approved construction dewatering period.

The Site Manager, Dewatering Contractor and Water Treatment Specialist must agree on a dewatering strategy and appropriate position of the dewatering treatment system and water retention tanks, prior to the commencement of the excavation works.

4.4.2 Operational Phase Dewatering

Due to low hydraulic conductivity of the water bearing (clay / sandstone) lithology, a drained basement is proposed for dewatering during the operational (post-construction / long-term) phase of the development. This will involve collection of groundwater seepage in an on-site detention (OSD) tank, or equivalent, with periodic discharge to the municipal stormwater network, under consent authority approval.

It is understood that WaterNSW may consider an application for long-term, operational phase dewatering, where minimal impact considerations under the AIP are satisfied. An assessment against the AIP is undertaken in **Section 7**.

4.5 Discharge Flow and Volume Monitoring

The volume of water discharged off-site must be monitored by a calibrated flow meter (or equivalent alternative means) that is integrated with the dewatering system. Such monitoring will be implemented throughout the entire dewatering period. The flow meter will display the cumulative volume discharged, which will be documented as part of the dewatering monitoring records.

Flow and (cumulative / total) volume data will be documented by a site official, under supervision of the Site Manager. Records must be made available to the Environmental Consultant for inclusion in the monitoring reports. These records will be used to calculate the actual groundwater volume discharged from the site and will be included in the final *Dewatering Completion Report* (DCR) to be issued to Council and WaterNSW upon completion of the dewatering activities.

Flow monitoring data will be documented by a suitably trained site employee under the supervision of the Site Manager. Tabulated records should be maintained on site and made available to the Environmental Consultant for inclusion in the routine monitoring event reports.

These records will be used to calculate the actual groundwater volume taken from the site and will be included in the Construction Dewatering Completion Report (**Section 5.4.3**), to be issued to Council and WaterNSW after the completion of construction dewatering activities.

In regards to the off-site disposal of waters, details of the proposed discharge connection to the stormwater system must be provided, preferably in the form of drawings, suitable for Council review purposes.

4.6 Potential Drawdown-Induced Impacts

A review of potential adverse effects of dewatering on neighbouring properties and groundwater dependent ecosystems was undertaken, as summarised in **Table 4-1**.

Table 4-1 Assessment of Potential Dewatering Effects

Attribute	Description
Proximity of GDEs	No high priority groundwater dependent ecosystems were within a 40m radius of the site (**Section 2.7**).
Potential impacts on groundwater quality resulting from contaminant migration	The exceedances identified during the baseline GME **(Section 3)** should be managed by the treatment system before discharge. Therefore, no migration of contamination is anticipated.
Water supply losses by neighbouring groundwater users	No registered water supply bores within a 500m radius of the site (**Section 2.4**). Hence, water supply losses by neighbouring groundwater users is considered unlikely.
Potential subsidence of neighbouring structures	Drawdown-induced ground settlement for the proposed development is predicted to be 0.7mm, due to a maximum drawdown of 5.3m. Ground settlement levels less than 10mm are categorised as posing 'negligible' risk of damage (Cashman and Preene, 2001). Nevertheless, it would be prudent for potential risks to neighbouring structures to be assessed by a qualified and experienced structural engineer.
Mounding of water up gradient of structure	As the basement will be designed as a draining structure for this project, groundwater mounding is not a consideration.

5. WATER QUALITY MANAGEMENT

5.1 Responsibility

The Principal Contractor or Site Manager, appointed for the construction works, will be responsible for implementing the water quality management procedures described in this report. Post-construction (i.e. occupational phase) water quality management, including water treatment and water quality monitoring will be overseen by strata management (see also **Section 7.3**).

5.2 Discharge Water Quality Guidelines

In accordance with statutory requirements for site dewatering operations, discharged waters must comply with the ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, or relevant default criteria where the ANZG (2018) guidelines do not provide values. This requirement is in compliance with the *Protection of the Environment Operations Act 1997*.

The nearest, primary receiving water body is Tannery Creek, which flows into Burns Bay of the Lane Cover River (**Section 2.6**). Due to tidal influences and its urban setting, these waterbodies hereby classified as a slightly to moderately disturbed, marine ecosystem. Therefore, the ANZG (2018) *95% Marine Default Guideline Values*, in combination with the 99% *Marine Default Guideline Values* for bio-accumulative toxicants, will be adopted as the discharge water criteria (DWC) for this dewatering program.

For water quality parameters that are not currently addressed by ANZG (2018), relevant alternative criteria have been adopted as the default DWC, as detailed in **Table 5-1**. The listed parameters and their respective criteria are applicable for the assessment of water quality to confirm suitability for discharge to the storm water network.

The listed parameters and corresponding criteria will apply for both the initial (pre-dewatering) and on-going assessment of water quality of water being discharged to the storm water system during the construction and occupational phases of the development. Noted that specific analytical parameters are not mandatory after the baseline groundwater quality assessment, in accordance with the *Routine Water Quality Monitoring Lists* in Appendix A of DPIE (2022) *Minimum Requirements for Building Site Groundwater Investigations and Reporting*.

Table 5-1 Discharge Water Criteria

Analyte	DWC (µg/L) [1]
Dissolved Metals / Inorganic Comounds	
Aluminium (for waters with pH > 6.5)	37
Antimony	9 [2]
Arsenic III	94 [2]
Arsenic V	42 [2]
Barium	20,000 [9]
Beryllium	600 [9]
Boron	1500 [2]
Cadmium	0.7
Chromium III	27

Chromium VI	4.4
Cobalt	1
Copper	13 [3]
Iron	3,000 [9]
Lead	4.4
Lithium	No Criterion
Manganese	80
Mercury	0.1
Molybdenum	34 [2]
Nickel	70
Selenium	18 [2]
Silica	No Criterion
Silver	1.4
Strontium	No Criterion
Uranium	0.5 [2]
Vanadium	100
Zinc	80 [3]
Petroleum Hydrocarbons	
Oil and grease	*No visible sheens, surface films or oil and grease* [4]
Volatile TRH (C_6-C_9)	No Criterion
Semi-volatile to heavy TRH (C_{10}-C_{40})	No Criterion
Monocyclic Aromatic Hydrocarbons (BTEX)	
Benzene	700
Toluene	180
Ethylbenzene	80
o - xylene	470 [2]
p - xylene	250 [2]
m - xylene	75
Polycyclic Aromatic Hydrocarbons (PAH)	
Benzo(a)pyrene	0.1
Naphthalene	70
Microbiological Organisms	
Faecal coliforms	No Criterion
Faecal *streptococci*	No Criterion
Escherichia coli	Not detectable in 100 mL [9]
Major Ions	
Anions: sulfate, chloride, carbonates, bromide, fluoride	No Criterion
Cations: calcium, magnesium, sodium, potassium	No Criterion

Ionic balance: cation / anion balance (as a percentage)	No Criterion
Nutrients	
Ammonia	910
Nitrate	3,400 [5]
Nitrite	30,000 [9]
Total Oxidised Nitrogen	5 [8]
Total Nitrogen	120 [8]
Total Phosphorus	25 [8]
Reactive Phosphorus	10 [8]
Other	
Total Cyanide	4
Phenol	400
PFOS	0.13 [8]
PFOS + PFHxs	2 [8]
PFOA	220 [8]
Physiochemical Parameters	
pH (pH units)	6.5 to 8.4 [6]
Turbidity (NTU)	10 [7]

Note 1 Discharge water criteria are the ANZG (2018) *95% Default Guideline Values (DGVs)* for the protection of slightly to moderately disturbed freshwater ecosystems, with the *99% DGVs* applied for the bio-accumulative parameters *benzo(a)pyrene*, *cadmium* and *mercury*, unless otherwise indicated.

Note 2 For the metals copper and zinc, which are commonly present as regional background components in groundwater at concentrations above the ANZG 2018 95% Fresh DGVs, discharge water criteria are set at one order of magnitude higher than the ANZG 2018 DGV.

Note 3 The ANZG (2018) only provides freshwater criteria at an 'unknown' level (%) of species protection for *antimony, chromium III, cobalt, molybdenum, uranium* and *vanadium*; therefore, these DGVs are applied.

Note 4 NHMRC (2008) No Detectable Oil & Grease - OG test must find no visible film or sheen at the water surface and no detectable hydrocarbon odours, based on aesthetic aspects, as described in NHMRC (2008) *Guidelines for managing risks in recreational water*, Section 10.2.2.

Note 5 In the absence of ANZG (2018) criteria, alternative pH criteria from ANZECC / ARMCANZ (2000), Table 3.3.2 *Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems* were used. The adopted pH range for *freshwater lowland rivers* was applied.

Note 6 In the absence of ANZG 2018 criteria in relation to Turbidity and water salinity (as indicated by EC), the ANZECC & ARMCANZ (2000), Table 3.3.3 *upper default trigger value for lowland rivers* is applied.

Note 7 Criteria in relation to Nitrate taken from ANZG (2025), 95% DVG for nitrate in hard (>150mg/l $CaCO_3$) freshwater (Ref. Table 2 Toxicant default guideline values for nitrate in freshwater, with high reliability) is applied.

Note 8 DWC value is derived from the National Environmental Management Plan for PFAS (2020) - *95% species protection for slightly to moderately disturbed systems*.

Note 9 In the absence of ANZG (2018) criteria, alternative criteria from ANZECC / ARMCANZ (2000), Table 3.3.2, Default trigger values for physical and chemical stressors for south-east Australia for slightly disturbed ecosystems, freshwater lowland rivers criteria were adopted for total nitrogen, total oxidised nitrogen, total phosphorus and reactive phosphorus.

5.3 Additional Pre-dewatering Monitoring Event

An additional round of groundwater quality assessment will be undertaken prior to commencement of construction dewatering, to verify the baseline concentrations and water treatment requirements. Laboratory analysis of groundwater samples must include the analytical parameters listed in **Section 3.4.3 / Table 5-1** (hence, additional analyses for chromium VI speciation, as well as oil and grease, are to be undertaken).

5.4 Discharge Water Quality Monitoring

5.4.1 Visual and Odour Monitoring

Visual inspections of the dewatering measures and equipment should occur regularly (daily where possible) by the Site Manager and/or Dewatering Contractor, to ensure:

- The effective operation of all dewatering treatment equipment, including inspection that short-circuiting of water around baffles and filter media is not occurring within sediment retention tanks;
- No petrochemical sheens are visible on the water surface and no hydrocarbon odours are being generated by the treated groundwater or sediment; and
- No green, blue or extremely clear effluent, potentially indicating high levels of dissolved aluminium (if used in the treatment process).

The Site Manager must keep a record of all visual observations and operational measurements such as flow rates and water flow meter readings (if used), as detailed in **Section 5.6**.

5.4.2 Sample Collection and Analysis

On-going sample analysis must continue for the duration of construction dewatering activities, to establish that the treatment system (if required) is functioning as intended, and to confirm the quality of discharge water is acceptable for off-site release.

Sample collection should be completed by the Environmental Consultant, with the subsequent analyses performed by a reputable environmental laboratory using NATA-registered analytical methods. The analytical program is to initially include the parameters listed in **Table 5-1, Section 5.2**; however, in accordance with *Appendix A – Routine water quality monitoring lists* (DPIE, 2022), certain parameters may be removed from the analytical suite, subject to the results of the additional pre-dewatering monitoring event (described in **Section 5.3**).

The following activities are to be implemented for the on-going monitoring program:

Trial-Run Period

- Prior to the discharge of any extracted groundwater, a trial run will be completed as follows:
  - Initial groundwater pumped from the site will be diverted into the excavation, until a reduction in suspended sediments is observed, which are expected in the initial pump-out waters;
  - Samples of the treated groundwater will be collected and laboratory analysed for the DPIE (2022) mandatory water quality parameters; and
  - After confirmation that the water quality complies with criteria, the extracted groundwater will be directed to the municipal storm water system, using the Council-approved connection point.
- As a minimum, two samples of treated groundwater will be collected for each of two weeks during the designated trial-run period. The analytical results will be compared to each other, as well as to the DWC, to assess the performance of the water treatment system. The results of each sampling event will be recorded, to establish chemical concentration trends (if any).
- Bi-weekly sampling should be maintained for a minimum of two weeks following commencement of the dewatering treatment, unless stated otherwise by the Environmental Consultant. Sampling for trial run purposes will cease once the target parameters in treated water stabilise (i.e. consecutive tests are within ±10% of the observed results) and contaminant concentrations are within the adopted discharge criteria for three consecutive sampling events. The trial-run period may be extended if stabilisation is not observed, or if the treated water does not satisfy the adopted criteria.

- The Dewatering Contractor / Water Treatment Specialist should seek advice from the Environmental Consultant regarding termination of the trial-run period.
- During the trial-run period, all collected groundwater seepage (including treated water) should be retained on-site and stored in appropriate bulk containers. No collected groundwater should be discharged until it is proven to meet the adopted criteria.

Construction Phase - Monitoring Frequency (Weekly, Fortnightly and Monthly)

- After the Trial-Run Period, and subject to statutory authority approval, treated water may be discharged to the storm water system. A weekly sampling frequency will be adopted for four weeks. The sampling program will involve the collection of one system discharge (i.e. treated) sample (as a minimum), to be analysed for the target parameters of concern, to confirm the system is functioning as intended.
- After four weeks, the weekly sampling frequency may be extended to fortnightly monitoring for one month and then monthly for the remaining duration of construction phase dewatering, provided the analytical monitoring results indicate the treated water quality consistently meets the adopted criteria. If this is not achieved, contingency measures must be implemented, with monitoring frequency going back to weekly until consistency in the discharged water results is re-established.

Operational Phase - Monitoring Frequency (Annual)

- Provided that compliant results are consistently achieved, the monitoring frequency can be annual during the operational period, until the end of Year 3, as described in **Section 7.3**.
- As per the construction phase monitoring, contingency measures detailed in **Section 6.5** should be implemented if groundwater results exceed or are predicted to exceed the adopted criteria for any one monitoring event, based on trending water quality results.
- Any changes to the sampling frequency are to be determined by the appointed environmental consultant, and justification must be documented in the monitoring records.

Note: All laboratory analytical results for the water samples must be retained, to be made available upon request by Council and/or WaterNSW.

5.4.3 Reporting of Water Quality Results

Dewatering management procedures and monitoring results will be reviewed by the appointed Environmental Consultant to ensure that the treatment procedures are effective, and that the discharge waters are in compliance with the adopted DWC (**Table 5-1**). Discharge water quality reporting will be required as follows:

- **Interim Monitoring Reports** will be prepared and issued to the Site Manager (during the construction phase), upon receipt of laboratory data for each round of water quality monitoring for the discharged waters. The interim reports will detail the sampling methods and procedures, provide a comparison between historical and current results, assess the results against the adopted criteria and provide recommendations on corrective actions, when required.
- **Interim Dewatering Completion Report** - Following completion of construction dewatering activities, an *Interim Dewatering Completion Report* will be prepared by the appointed Environmental Consultant, as described in **Section 5.6.1.** The interim report will report on construction phase dewatering and must include copies of all analytical results and monitoring reports issued during the construction phase dewatering period. The report will be submitted to Council and Water NSW.
- **Annual Dewatering Monitoring Reports** will be prepared as described in **Section 5.6.2**, upon receipt of laboratory data for each annual round of water quality monitoring during the operational phase of the development, as described in **Section 7.3**.

5.5 Water Treatment

5.5.1 Treatment System Design

Treatment of extracted groundwater will be required on consideration of the baseline data (**Section 3**). EI suggests that the selection and design of the preferred water treatment system is made by the Dewatering Contractor / Water Treatment Specialist, in collaboration with the appointed Environmental Consultant. Alternative and/or additional water treatment options will be implemented, if necessary, depending on which parameters are found to exceed the DWC.

The design and installation of the preferred system should consider:

- A treatment tank with minimum capacity capable of containing the expected inflow for the basement (as described in **Section 4.4.1**);
- Water filtration to reduce fine particulates;
- If applicable, automated in-line chemical dosing systems for the addition of buffering solutions and/or coagulants for the adjustment of pH and other parameters, which may be required as described in **Section 6.5** *Dewatering Contingencies*;
- Treatment to reduce concentrations of contaminants exceeding the DWC to below the values presented in **Table 5-1**;
- Spare retention tank(s) (if required) to provide additional residence time and sedimentation, in the case that non-compliant water quality is identified during routine monitoring, triggering temporary redirection and storage while adjustments to the water treatment system are being implemented; and
- A means of monitoring flow rate to enable the accurate determination of total discharge volume.

The water treatment system should be installed, tested and operational prior to the commencement of dewatering, to ensure that only treated water meeting the adopted quality criteria is discharged to the receiving water bodies.

5.5.2 Treatment System Maintenance

The groundwater treatment system(s) must be regularly maintained by the Dewatering Contractor / Water Treatment Specialist. Maintenance must include (if applicable):

- Regular cleaning and or replacement of the geo-fabric/particle filters within the retention tanks;
- Media changeover (e.g. granular activated carbon) whenever breakthrough conditions are met; and
- Regular removal of sediment from the retention tanks by an appropriately-licensed waste contractor.

5.6 Reporting of Dewatering Information

5.6.1 Interim Report - Construction Dewatering

In accordance with WaterNSW requirements, interim and completion reports will be submitted to WaterNSW, during and at the end of temporary (construction phase) site dewatering. The final completion report must accompany an application to WaterNSW to surrender the water supply work approval.

All periodic records, including flow rate and volume data, groundwater level monitoring and laboratory analytical reports, must be submitted to the Environmental Consultant by the appointed specialist / contractors. They are to be included in the corresponding Interim Report.

At the completion of the construction phase, a Completion Report will be submitted to Council and WaterNSW for review. It must document all records collected from the beginning to the end of the construction dewatering period.

5.6.2 Annual Reporting for Operational Dewatering

Site dewatering will continue during the occupational phase of the development. The monitoring conducted during this phase will be the responsibility of Strata Management. Annual reporting shall be conducted, with the presented information to be the same as that required for the Interim Report (described in **Section 5.6.1**). Each report shall be submitted to WaterNSW, under the title "*Annual Report – Occupational Dewatering"*.

Monitoring frequencies for the occupational phase are detailed in **Section 7.3**.

All laboratory analytical results, flow meter logs and groundwater level monitoring records must be maintained by strata management, and should be made available upon request by Council and/or WaterNSW.

5.6.3 Dewatering Completion Report

A final Dewatering Completion Report (DCR) will be drafted at the termination of site dewatering. A blank (template) Dewatering Completion Report may be downloaded from the WaterNSW website (**Appendix I**):

https://www.waternsw.com.au/__data/assets/pdf_file/0004/167278/Completion-report-for-dewatering-work.pdf.

The DCR, together with an application to surrender the water supply works approval (**Appendix I**), shall be submitted to Council and WaterNSW.

6. SITE MANAGEMENT AND CONTROLS

6.1 Deviations from this Plan

The Site Manager should seek advice from the Environmental Consultant whenever deviation from the agreed monitoring program is considered. To ensure the monitoring data set and the early warning objectives of the DMP are not compromised, variations will only be considered where technical justification exists, and any deviations that may be accepted will be documented within the corresponding reports, and must include all justifications for the variation accepted.

Should deviations from the DWC be considered technically justifiable, approval from Council and/or WaterNSW must be obtained before alternative discharge criteria are applied.

6.2 Contact Details for Key Personnel

Once the relevant personnel have been appointed, their names and contact information must be clearly displayed on-site, within the site office. An example format is as follows:

Site Manager	Name: To be confirmed. Company: To be confirmed.	Mobile phone: To be confirmed. Email: To be confirmed.
Dewatering Contractor	Name: To be confirmed. Company: To be confirmed.	Mobile phone: To be confirmed. Email: To be confirmed.
Water Treatment Specialist	Name: To be confirmed. Company: To be confirmed.	Mobile phone: To be confirmed. Email: To be confirmed.
Environmental Consultant (Water Quality Expert)	Name: To be confirmed. Company: To be confirmed.	Mobile phone: To be confirmed. Email: To be confirmed.

6.3 Summary of Specific Activities

The appointed contractors and/or Site Manager will be responsible for ensuring that the following activities (requirements) are undertaken during the dewatering program:

- Maintain erosion and sediment control measures in a functioning condition, until all earthwork activities are completed.
- Perform daily visual inspection of the recharge well(s), stormwater diversions and sediment / erosion control devices, ensuring they are operating effectively and at full capacity.
- Implement appropriate remedial measures where any controls or devices are not functioning effectively or are inappropriate.
- Collate records and comments on the condition of existing erosion and run-off controls (drains, silt fences, catch drains etc.), dewatering procedures and test results, and any site instructions issued to sub-contractors to undertake remedial works.
- Maintain rainfall data (to be filed on site).
- Confirm water quality parameters meet the relevant discharge limits, by disclosing supporting documentation upon request.
- Reporting any incidents of poor drainage or uncontrolled discharge.
- Recording all daily inspection reports, environmental incidents and controlled discharge volumes, which may be reviewed during any environmental audit performed on the site.

6.4 Vibration, Noise, and Odour Management

The following vibration, noise and odour risks must not occur during dewatering:

- Excessive vibration and noise levels associated with site plant / dewatering equipment; and
- Odours released from collected groundwater, which may pose a risk to human health and/or the aesthetic condition of the environment.

It is the responsibility of the Site Manager to ensure appropriate management of vibration, noise and odour during dewatering operations. Appropriate management methodologies include:

- Undertaking dilapidation surveys of neighbouring buildings, in accordance with potential for impacts in final design type.
- All sub-contractors to work only within defined hours set by the development consent conditions.
- All reasonable steps shall be taken to muffle and acoustically baffle all plant and equipment. Noise and vibration levels generated by site works must be within the limits set by the consent conditions, the site specific environmental management plan and the *Protection of Environmental Operation Act 1997*.
- Give consideration to noise emitted by plant/equipment prior to its selection/mobilisation to site.
- Schedule the use of noisy equipment at the least-sensitive time of day.
- Situate noisy equipment at the greatest distance from the noise-sensitive area, or orient the equipment so that noise emissions are directed away from sensitive areas, to achieve the maximum attenuation of noise.
- Where there are several noisy pieces of equipment, schedule operations to minimise cumulative impacts.
- Keep equipment well maintained.
- Ensure engine shrouds (acoustic linings) are installed (where feasible).

6.5 Dewatering Contingencies

Contingent actions for scenarios that may arise during dewatering are detailed in **Table 6-1**.

Table 6-1 Mitigation Measures for Potential Dewatering Issues

Anticipated Problems	Corrective Actions
Water Quality Criteria Non-compliance	
Discharge Water Criteria Exceedance Laboratory analytical report for any monitoring event reveals that the quality of treated discharge water does not satisfy the adopted discharge performance criteria detailed in **Table 5-1**, **Section 5.2**.	Immediate action must be taken to halt the release of water into Council's stormwater system, where water quality is found not to meet the discharge criteria detailed in **Table 5-1**. 1) Discharge to the stormwater system must be suspended to enable the following procedure to be implemented: 2) Discharge water will be redirected to the spare retention basin; 3) A water sample will then be collected and sent to the laboratory for confirmation analysis for the non-compliant parameter(s) on an express (24 hour) results turn-around basis; 4) Should the analytical result for the confirmation sample show that the previously non-compliant parameter(s) is/are now meet the adopted discharge water quality performance criteria, the treated water outlet may be redirected to the stormwater system; however

Anticipated Problems	Corrective Actions
	5) Should the analytical result for the confirmation sample show that the discharge water quality is confirmed not to comply with the discharge criteria, then the Water Treatment Specialist will be directed to modify the water treatment system accordingly to achieve compliant discharge water quality and a new treated water sample will be collected; 6) After confirmation that the revised treated water quality complies with the discharge criteria, the extracted groundwater may be re-directed to the stormwater discharge point; and 7) The frequency of treated water quality monitoring will be returned to weekly, until such time that three consecutive compliance events are achieved, at which stage fortnightly monitoring may be reinstated. **Note:** It may be necessary to have collected waters removed by a licensed wastewater contractor, should retained quantities exceed the onsite capacity for temporary storage.
Visible and Olfactory Impacts Visual and / or olfactory anomalies (e.g. change in water colour, turbidity, odour, presence of oil / grease) are observed in extracted groundwater.	Similar to the above procedure (Steps 1 to 6) treated water will be redirected to the spare retention basin, while the treatment system is adjusted to manage the observed water quality issues. It may be necessary to have collected waters removed by a licensed wastewater contractor, should retained quantities exceed the onsite capacity for temporary storage. The contractor is to seek advice from a suitably experienced environmental consultant in regard to the additional assessment and treatment that may be required for any observed changes to water appearance or detectable odours.
Repeated Criteria Exceedances After three performance criteria non-compliances for discharge water quality	Retain extracted water onsite in spare retention basin(s) and appropriate bulk containers, until it can be removed by a licensed waste contractor. Determine an alternative discharge method, if necessary, updating the DMP accordingly.
Groundwater Take Non-Compliance	
Excessive Extraction Daily discharge rate is greater than expected and it is apparent that the projected total groundwater extraction volume will be exceeded	Advise the appointed environmental consultant who will review the reasons for the increased dewatering rate. If reduction in dewatering rate cannot be implemented, WaterNSW should be contacted to review options, which may include a combination of: ▪ Temporary retention of tail water onsite in appropriate bulk containers for subsequent removal by a licensed waste contractor; ▪ Aquifer re-injection after obtaining regulatory approval; and/or ▪ Fast-tracking of construction works to complete dewatering sooner than the scheduled timeframe.
Drawdown Settlement Risk	
Excessive Water Level Drawdown	As documented in the EI (2025b) GSA, dewatering will have negligible, if any, adverse impact on the neighbouring properties. The groundwater drawdown adjacent to the site cause by dewatering is considered negligible. **Note**: The client, geotechnical engineer, structural engineer and relevant stakeholders (including the property owner(s) that may be affected), should be notified and revisions to the dewatering approach for localised deeper works (e.g. localised pumping around lift pits and other deeper construction features), must be defined and implemented to manage potential settlement risk in order to safeguard neighbouring buildings/structures.
System Performance Issues	
Dewatering System Failures	Ensure that spare equipment parts (where practical) are on hand. Ensure that the failed equipment can be serviced by site personnel or an appointed contractor who can rapidly report to site when needed.

Anticipated Problems	Corrective Actions
Power Outages	Ensure that a backup generator is readily available. In this event, an assessment across the site and surrounding sites should also be completed in order to identify whether any other lights and electrical equipment are working so to identify if the issue is site specific or if it is across a whole area. In addition to having the back-up generator running, the contractor should also seek advice from an electrician in regard to the additional assessment and repairs that may be required.
Unexpected Contaminants	Contact the appointed water quality expert and assess against relevant criteria. If contaminant is found to exceed the adopted criteria, determine the corrective actions. Expand DWC accordingly.
Chemical / Fuel Spills from Machinery	Stop earthworks, notify site project manager. Use accessible soil or appropriate absorbent material to absorb the spill (if practicable). Stockpile the impacted material in a secure location, on builder's plastic to avoid cross contamination. Inspect groundwater and note any visual and/or changes. The contractor should also seek advice from environmental consultant in regard to the additional assessment and treatment that may be required.
Excessive Rainfall	Ensure sediment and surface water controls are in place and functioning as intended, as per the designs provided in the site specific Soil and Water Management Plan. Any non-conformance is to be documented and rectified. The capacity of the dewatering system to dispose larger volumes of water should be evaluated and if required, a temporary system should be utilised following correspondence with Council / WaterNSW and the environmental consultant.
Excessive Noise	Identify the source and isolate if possible. Modify the actions of the source or erect temporary noise barriers if required.
Impacts on the Stability of Adjacent Structures	Contractor to seek advice from qualified professional (such as a geotechnical engineer and/or structural consultant) in regards to the additional assessment and monitoring that may be required.
Complaint Management	Notify Client, Project Managers and Environmental Consultant (if required) following complaint. Report complaint as per management procedures. Implement control measures to address reason of complaint (if possible). Notify complainant of results of remedial actions.
Excessive Organic Odours / Vapours	In accordance with Council's Contaminated Land Policy, no nuisance odours are to be detected at any site boundary during the dewatering stage. Should odour emissions be detected at a site boundary, the following measures will be implemented: 1) Stop work, to allow odour to subside. 2) Monitor ambient air across the site and boundaries with a portable photo-ionisation detector (PID). 3) Implement control measures, including respirators for on-site workers, use of odour suppressants and wetting down of excavated material. 4) Notify the occupants of adjoining premises regarding odour issues. Notification should be in writing, providing the contact details of the responsible site personnel. 5) Record logs for volatile emissions and odours.
Complaint Management	Notify client, site manager and environmental consultant (if required) logging and following up complaint. Reporting should follow management procedures. Implement control measures to address reason of complaint (if possible) and notify complainant of outcome.

7. MINIMAL HARM ASSESSMENT

7.1 Consideration of NSW Aquifer Interference Policy

In accordance with the *NSW Water Management Act 2000*, the taking and/or disposal of water taken from an aquifer is defined as an aquifer interference activity. The *New South Wales Aquifer Interference Policy 2012* (AIP) provides guidance for the assessment of potential impacts of dewatering on water users and groundwater dependent ecosystems. The AIP assessment process was performed with due regard for all hydrogeological information collected for the site and is presented below.

7.1.1 Hydrogeological Model Summary

With reference to the site-specific CHM (**Section 3.2**), for a bedrock aquifer with groundwater under pressure conditions, groundwater seepage would enter the excavation flowing through joints, faults and bedding plane fractures within the bedrock. Lower seepage flow volumes may be expected during depressed groundwater levels in dry periods, with higher seepage flow after high rainfall events, which would be expected to cause temporary, elevated groundwater levels.

7.1.2 Groundwater Source Category

Under Section 3.2.1 *Aquifer Impact Assessment* of the AIP, a *Highly Productive Groundwater Source* is defined as one that:

a) has total dissolved solids (TDS) of less than 1,500 mg/L; and

b) can yield water at a rate greater than 5 L/sec.

Baseline groundwater salinity was shown to be low with EC values ranging from 647-806 µS/cm µS/cm; and TDS ranging from 210-270 mg/L (see **Table B2**). With reference to the EI (2025b) GSA, inflow to the basement will be approximately 0.15 L/sec (13 m^3/day).

The aquifer at the site therefore meets the description of a *Less Productive Groundwater Source*, as defined under Section 3.2.1 *Aquifer Impact Assessment* of the AIP.

7.1.3 Minimal Impact Considerations

In accordance with the Table 1 *Minimal Impact Considerations for Aquifer Interference Activities* of the AIP, *"If the predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable."*

Table 1 of the AIP states that for *Less Productive Groundwater Sources* in low yielding porous and fractured rock water sources that are under groundwater pressure conditions, the following impact considerations are applicable:

Drawdown

- *Level 1 – A cumulative pressure head decline of not more than 2m, at any water supply work.*
- *Level 2 – If the predicted pressure head decline is greater than the Level 1 requirement (above), then appropriate studies are required to demonstrate to the Minister's satisfaction that the decline will not prevent the long-term viability of the affected water supply works unless make good provisions apply.*

Water Quality

- *Level 1 - Any change in groundwater quality should not lower the beneficial use category of the groundwater source beyond 40m from the activity.*

- *Level 2 - If the Level 1 condition (above) is not met, then appropriate studies will need to demonstrate to the Minister's satisfaction that the change in groundwater quality will not prevent the long-term viability of the dependent ecosystem, significant site or affected water supply works.*

7.1.4 Impact Assessment Conclusions

The proposed dewatering for the construction and operational phases at this site are considered to be compliant with the AIP minimal impact criteria for the following reasons:

- While the estimated maximum cumulative pressure head decline (5.3m) is greater than *Level 1 minimal impact considerations*, there are no active water supply bores within 500m of the site; therefore water supply losses in response to dewatering are unlikely.
- As the drawdown will occur in competent bedrock and less than 0.7 mm of ground settlement is predicted immediately adjacent to the shoring wall, which is d'eemed to be negligible (as described in GSA report), no potential adverse impacts are likely for neighbouring properties.
- Residual, onsite groundwater contamination sources will be treated/removed as part of the bulk excavation process, however, as there are no registered water supply bores in the vicinity of the site, adverse impacts to groundwater quality and corresponding lowering of the beneficial use category of the groundwater source are unlikely. Level 1 Water Quality conditions would therefore be maintained.
- There is no documented, high priority GDE within 40 m of the site.

In addition to the above, the routine monitoring of treated water quality, groundwater drawdown and water take, as well as the dewatering contingencies tabulated in **Section 6.5**, are designed to ensure that potential impacts are minimised.

7.2 Assessment Inputs

The inputs for assessing the potential impacts of dewatering on the groundwater system are summarised in **Table 7-1**.

Table 7-1 Assessment Inputs Summary

Assessment Item	Comments
1. Estimated water take volume	As detailed in **Section 4.2**, the water take volume is estimated to be **4.8 ML** per year during the construction and operational phases of development.
2. Suitability of volume estimation	Use of *PLAXIS 2D* (a finite element computer model), implemented by experienced geotechnical engineer and reviewed by senior geotechnical engineer (see **Appendix E**).
3. Ground elevation across the site	The site downslopes south east, from a relative level of 26m AHD in the north western corner, to 16m AHD in the south east portion.
4. Geotechnical ground characterisation	Refer to **Appendix D**.
5. Water level measurements	Groundwater levels were measured at depths from 16.68m AHD (minimum) to 21.65m AHD (maximum). Periodic groundwater level gauging will be conducted on an annual basis (i.e. one monitoring event per year) at monitoring wells during the operational phase.
6. Required water level draw down and potential impacts	The EI (2025b) GSA determined there will be a drawdown of 5.3m from the shoring wall as a result of the dewatering, which will have a negligible impact on the neighbouring properties. As the dewatered lithology comprises competent bedrock, ground settlement impacts due to drawdown during temporary construction dewatering are unlikely to be significant.

Assessment Item	Comments
7. Works proposed for dewatering	A drained basement using a sump-and-pump system, as described in **Section 4.4**.
8. The base level of the aquifer	Fractured sandstone bedrock extends below the proposed bulk excavation level.
9. Excavation footprint dimensions	Refer to the basement plan in **Appendix C**.
10. Hydraulic conductivities of lithological units	Detailed in Table 1 of the EI (2025b) GSA (**Appendix D**).
11. Anticipated duration of dewatering	Dewatering will be ongoing for the approved construction period, while operational dewatering will be ongoing for the life time of the development
12. Depth of piling embedment beneath bulk excavation	Refer to **Section 4.1** (embedment depth will be provided with final design and detailed shoring plans).

7.3 Operational (Occupational) Phase Dewatering Management

7.3.1 Monitoring and Reporting

The following procedure will be adhered to by strata management to ensure that the long-term dewatering system is managed appropriately:

- **Groundwater Level Monitoring**: Scheduled groundwater level monitoring is required for the first 36 months of the sump and pump operational phase in order to characterise seasonal groundwater level fluctuations for the operational (post-construction) phase of the development. It is noted that the occupational phase of the development commences prior to the sump and pump commences operation.

  A quarterly groundwater level monitoring frequency (i.e. once every 3 months) will be adopted for the first twelve months of occupation. This will be followed by semi-annual water level monitoring (i.e. once every 6 months) for the second year; then annual monitoring (i.e. a monitoring event at the end of the third year). Water level data will be recorded on a data form to document date of monitoring, well identification number, reference point from where all water level measurements are consistently taken (e.g. top of well casing, or ground level), the depth to water and the name of the person conducting the monitoring.

- **Discharge Volume Monitoring**: The volume of water discharged to stormwater must be monitored by a calibrated flow meter (or equivalent alternative means) that is integrated as part of the long-term pumping system. The flow meter (or flow monitoring device) will display cumulative volume discharged, which will be recorded onto the same data form used to document groundwater level, at the time of each water level monitoring event. Discharge volume monitoring frequency will therefore be the same as for groundwater level monitoring, i.e. quarterly for the first year, every 6 months for year two, and a single monitoring event at the end of year three.

- **Water Quality Monitoring**: A single, post-treatment water sample will be collected on an annual basis during the final monitoring event in each year (i.e. at 12 months and 24 months of operation). Treated water samples will be laboratory analysed for the priority discharge water quality parameters (**Table 5-1**), to confirm that DWC compliance and show that discharge water quality is not deteriorating with time. Given that the groundwater is to be treated prior to offsite discharge, the risks presented to the human health and environment for the construction phase of the development are considered low and acceptable. Groundwater assessment of water quality parameters is required at the end of the construction phase to verify concentrations, and review or amend proposed operational phase water treatment if required.

- **Annual Dewatering Monitoring Report**: A Dewatering Monitoring Report will be prepared after each 12 months of monitoring, by the appointed Environmental Consultant. Each report will document the groundwater level gauging results, groundwater quality results and the cumulative volume of water discharge from the seepage collection sump to the storm water system. The monitoring report will also include an updated copy of the monitoring data form, showing all monitoring records since the start of the occupational phase. Each annual monitoring report will also include a trend analysis of the monitoring data and provide a discussion to characterise trends in groundwater quality, groundwater levels as measured in the monitoring well and water discharge volumes over time.
- **Cessation of Monitoring**: Should watering monitoring after the 36th month of occupation confirm that groundwater quality, groundwater level fluctuations at the monitoring well(s) and annual groundwater discharge volumes are stable (i.e. not statistically trending up or down), then it will be determined that equilibrium has been reached and termination of the monitoring program would be justified. If this is not the case then the dewatering program will be reviewed accordingly. The appointed Environmental Consultant will provide notification to Council to document the termination or continuation of monitoring at this stage. Should monitoring be continued, a review of monitoring frequency will be undertaken and appropriate notification to Council will be issued by the appointed Environmental Consultant.

7.3.2 Monitoring Well Replacement Protocol

Should the existing wells be damaged during the construction works, installation of new groundwater monitoring wells will be required, under the management of a qualified and appropriately experienced Environmental Consultant. Strata management should formally engage the Environmental Consultant to perform the required monitoring.

Well design should be in accordance with the guidelines specified under the NUDLC (2020) *Minimum Construction Requirements for Water Bores in Australia*. Each well should be appropriately screened, with the water intake interval set across the lowermost basement level to monitor groundwater levels at the bulk excavation level, assuming uniform ground conditions.

All reasonable steps must be taken to have the replacement bore installed within one week of the damage having occurred, subject to licensed driller availability

8. DEWATERING MANAGEMENT SUMMARY

The requirements of the DMP are summarised in **Table 8-1**.

Table 8-1 Dewatering Management Summary

Item	Requirement / Procedure
Objectives of DMP	Ensure that the proposed dewatering operations do not impact on the quality of the receiving surface waters (i.e. at the point of groundwater discharge). Where necessary, groundwater will be treated to achieve an acceptable water quality prior to discharge: ▪ See **Section 3** for groundwater conditions. ▪ See **Section 5** for groundwater quality discharge requirements. ▪ See **Section 5** for groundwater treatment options. Provide comment on groundwater level changes that occur during dewatering: ▪ See **Section 4** for summary of groundwater take assessment and dewatering drawdown impacts. Refer to **Appendix E** for groundwater take assessment.
Person Responsible for Implementation of DMP	During construction, the Site Manager will be responsible for ensuring the implementation of the DMP. During occupation, Strata Management will be responsible for ensuring the implementation of the DMP.
Operation Policy	To ensure that all extracted groundwater from dewatering is effectively treated prior to discharge to the receiving water bodies.
Pre-Dewatering Groundwater Assessment	As per **Section 3.4**, representative samples will be tested for a broad range of parameters, to confirm baseline groundwater quality and treatment requirements.
DWC	All groundwater to be discharged into the local stormwater network is to meet (at the very least) the criteria outlined in **Table 5-1**, **Section 5.2**.
Implementation Strategy	All extracted groundwater will be monitored and treated (where necessary). On-going testing to be performed, to confirm water quality meets the adopted DWC prior to release into the stormwater network. Additional treatment / wastewater disposal to be undertaken if the DWC values are not met.
Monitoring Requirements for Construction Phase Dewatering	As specified in **Section 5.3**: ▪ 1. Initial assessment — Prior to dewatering ▪ 2. Trial-run period — Twice per week* ▪ 3. Discharge monitoring period — Weekly for a month to fortnightly for a month then monthly* ** provided the analytical results indicate treated water quality meets the adopted criteria, or risks are considered to be significantly low. Should analytical results exceed the adopted discharge criteria, contingencies listed in **Section 6.5** must be followed.*
Monitoring Requirements for Operational Phase Dewatering	As specified in **Section 7.3**, annual sampling and reporting, for three years minimum.
Auditing	The appointed Environmental Consultant will undertake weekly audits during the trial-run period (if required), and monthly audits thereafter, to ensure all discharges comply with the criteria specified in **Section 5.2**.
Reporting	The contractor responsible for dewatering will keep records of all monitoring and laboratory test results, as well as quantities of treatment agents applied during the dewatering process. All records should be made available for inspection onsite during the construction phase.
Corrective Actions	As specified in the contingency measures, outlined in **Section 6.5**.

9. STATEMENT OF LIMITATIONS

This plan has been prepared for the exclusive use of Lane Cove Developments No.1 Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of work completed for the purpose of this plan is limited to that agreed with Lane Cove Developments No.1 Pty Ltd.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in drafting similar plans by reputable members of the environmental industry in Australia, as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section must be read in conjunction with the whole of this plan, including its appendices.

EI's professional opinions are reasonable and based on its judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation or observations. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

Should you have any queries regarding this plan, please do not hesitate to contact EI.

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Appendix A – Figures

LEGEND. Note: All locations are approximate

Site Boundary

eiaustralia
Practical Solutions for Built Environments
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

Drawn:	M.C
Approved:	A.S.
Date:	15/07/2025

Lane Cove Developments No.1 Pty Ltd

Hydrogeological Report including GSA & DMP

300 Burns Bay Road, Lane Cove, NSW

Site Locality Plan

Figure: 1

Project: E26484.E16

Map Source:
NearMap, dated 16/2/22

LEGEND. Note: All locations are approximate

- Site Boundary
- Basement 1 boundary
- Basement 2 boundary
- Borehole location
- Groundwater Monitoring Well location

eiaustralia
Practical Solutions for Built Environments
Suite 6.01, 55 Miller Street, PYRMONT 2009
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Drawn:	N.J.
Approved:	A.S.
Date:	15/07/2025

Lane Cove Developments No.1 Pty Ltd

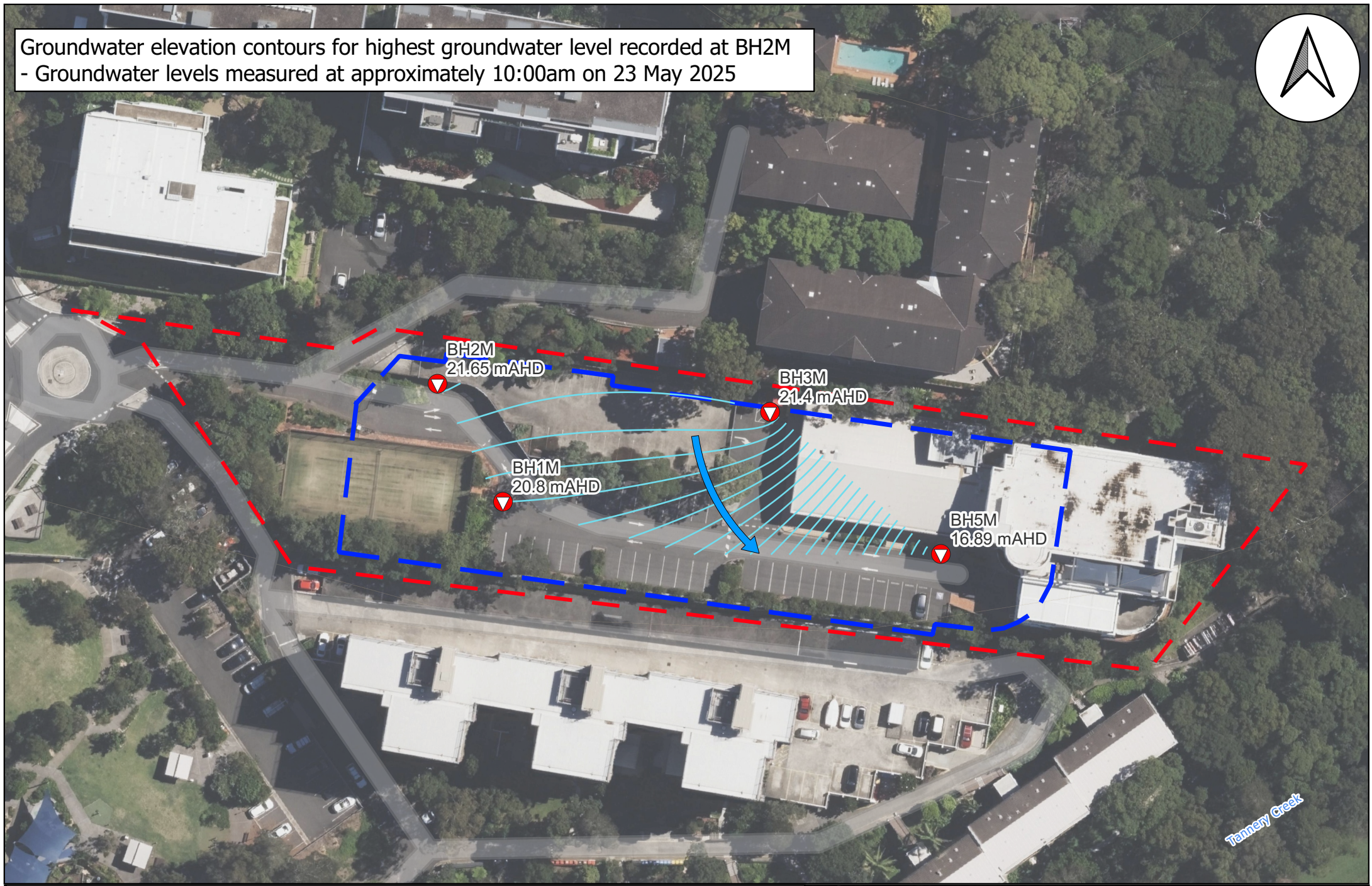
Hydrogeological Report including GSA & DMP

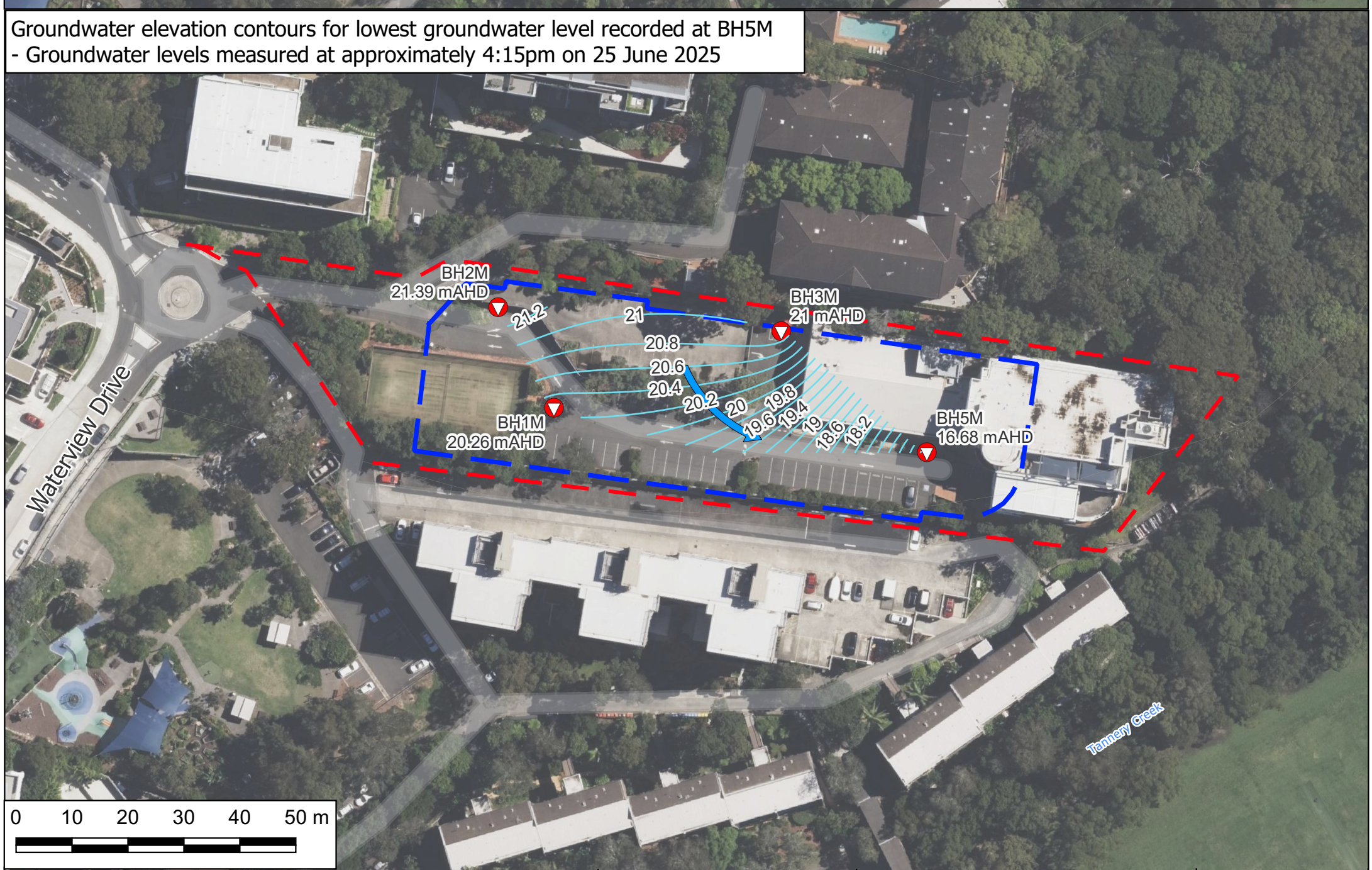
300 Burns Bay Road, Lane Cove, NSW

Sampling Location Plan

Figure: 2

Project: E26484.E16





LEGEND

- Site Boundary
- Groundwater contour (0.2m interval mAHD)
- Inferred groundwater flow direction
- Groundwater monitoring well location showing standing water levels in mAHD using data for max and min water level conditions

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Lane Cove Developments No.1 Pty Ltd

Hydrogeological Report including GSA & DMP

300 Burns Bay Road, Lane Cove

Groundwater Contour Plan

Figure: 3

Project: E26484.E16_Rev2

Drawn:	N.J.	Approved:	W.H.	Date:	03/12/2025	Map Source: NSW SIXMaps, accessed 14/07/2025

Appendix B – Tables

Table 1 - Summary of Baseline Groundwater Quality - Laboratory Analytical Results

Sample ID	Sampling Date	Metals																								PAHs			BTEX					VOCs
		Total As	Cd	Total Cr	Cu	Pb	Hg	Ni	Zn	Al (pH>6.5)	Sb	Ba	Be	B	Co	Fe	Li (mg/L)	Mn	Mo	Se 2	SiO_2 (mg/L)	Ag	Sr	U	V	Total PAHs	Benzo(a)pyrene	Naphthalene	Benzene	Toluene	Ethylbenzene	o-xylene	m/p-xylene	Total VOCs
Groundwater Investigation																																		
BH1M	18/9/2024	1	<0.1	<1	2	<1	<0.1	5	24	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	<0.1	<0.1	<0.5	2.4	<0.5	<0.5	<1	32
BH2M	18/9/2024	<1	<0.1	<1	6	<1	<0.1	3	16	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<1	10
BH3M	18/9/2024	<1	<0.1	<1	<1	<1	<0.1	6	18	21	<1	120	<1	33	4	1400	<0.005	240	<1	3	6.6	<1	65	<1	<1	<1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<1	<10
BH5M	18/9/2024	<1	<0.1	2	3	<1	<0.1	5	27	120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<1	18
Guidelines																																		
Water Quality Criteria		24 (As III) 13 (As V)	0.7	27 (Cr III) 4.4 (Cr VI)	1.3	4.4	0.4	70	8	80	9			1500	1			2500	34	18		1.4		0.5	100		0.2	70	700	180	80	470	75	

Sample ID	Sampling Date	Petroleum Hydrocarbons			Microbiological Organisms			Total Phenols	Total Cyanide	PFAS			Other																										
		Oil and Grease	TRH C_6-C_9	TRH C_{10}-C_{36}	Faecal (Thermotolerant) coliforms (MPN/100mL)	Faecal streptococci	Escherichia coli (E. coli) (MPN/100mL)			PFOS	PFOS + PFHxS	PFOA	Fluoride (mg/L)	Chloride (mg/L)	Sulfate (mg/L)	Bromide (mg/L)	Ammonia Nitrogen as NH3-N	Nitrate Nitrogen NO3-N	Nitrite Nitrogen NO2 as N	Total Oxidised Nitrogen, NOx-N	Total Kjeldahl Nitrogen	Total Nitrogen (calc)	Total Phosphorus (Kjeldahl) as P	Filterable Reactive Phosphorus as P	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Total Alkalinity as CaCO3	Hydroxide Alkalinity as OH (meq/L)	Bicarbonate Alkalinity as HCO3 (meq/L)	Carbonate Alkalinity as CO3 (meq/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	OCPs	OPPs	PCBs
Groundwater Investigation																																							
BH1M	18/9/2024	NA	<40	<320	NA		NA	<50	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27	6.8	NA	NA	NA	NA	NA
BH2M	18/9/2024	NA	<40	<320	NA		NA	<50	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6	5.4	NA	NA	NA	NA	NA
BH3M	18/9/2024	NA	<40	650	<1		<1	<50	<4	0.03	0.03	0.02	<0.1	32	48	<0.05	20	20	70	270	430	700	180	<5	59000	<5000	<5000	59000	<0.06	1.2	<0.03	11	5.4	44	4.6	<1	<5	<5
BH5M	18/9/2024	NA	<40	<320	NA		NA	<50	<4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.5	2	NA	NA	NA	NA	NA
Guidelines																																							
Water Quality Criteria			If TPH is detected analysis for BTEX and PAH is required					400	4	0.13		220					910	700		40		500	50	20															

Notes:

All values are µg/L unless stated otherwise

NA = Not Analysed

Water quality criteria are based on the ANZG (2018) 95% DGVs, or relevant default guidelines where ANZG criteria were not available

Highlighted value does not meet the adopted criteria

No relevant criteria are currently available

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Table 2 – Summary of Baseline Groundwater Quality Results: Physicochemical Characteristics

Sample ID	Date sampled	Physiochemical Characteristics												Aesthetic Properties
		Electrical Conductivity (Field EC) (µs/cm)	Electrical Conductivity (Lab EC) (µs/cm)	pH (field)	pH (lab)	Total Dissolved Solids (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	Field Redox (mV)	Hardness (mg $CaCO_3$/L)	Dissolved Oxygen (field DO) (mg/L)	Dissolved Oxygen (Lab DO) (mg/L)	Total Organic Carbon as NPOC (mg/L)	Oil & Grease (present/absent)
Groundwater Investigation														
BH1M	18/9/2024	806	400	6.54	6.4	270	NA	99	-11.9	94	0.33	NA	NA	Absent
BH2M	18/9/2024	671	330	5.43	5.4	210	NA	130	-217.3	36	0.62	NA	NA	Absent
BH3M	18/9/2024	782	330	5.96	5.9	210	590	780	142	49	0.62	3.2	2.5	Absent
BH5M	18/9/2024	647	310	5.33	5.2	210	NA	120	-301.4	22	0.43	NA	NA	Absent
Guidelines														
Water Quality Criteria		2000	2000	6.5 - 8.0	6.5 - 8.0			50						No visible sheens, surface films or oil and grease

Notes:

All values are in units as shown.

NA = Not Analysed

Water quality criteria are based on the ANZG (2018) DGVs, or relevant default guidelines where ANZG criteria were not available

Highlighted value does not meet the adopted criteria

No relevant criteria are currently available

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Table 3 - Summary of Results for the Field QA/QC samples

Sample identification	Description	TRH				BTEX				Heavy Metals							
		F1*	F2**	F3 (>C_{16} - C_{34})	F4 (>C_{34} - C_{40})	Benzene	Toluene	Ethylbenzene	Xylene (total)	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc
Intra-laboratory Duplicate - Groundwater Investigation																	
BH1M	Groundwater	<50	<60	<500	<500	<0.5	2.4	<0.5	<1.5	1	<0.1	<1	<1	<1	<0.1	5	24
GQD1	Duplicate of BH1M	<50	<60	<500	<500	<0.5	2.7	<0.5	<1.5	1	<0.1	<1	<1	<1	<0.1	5	25
RPD (%)		**0.0**	0.0	0.0	0.0	0.0	11.8	0.0	0.0	0.0	0.0	0.0	**0.0**	0.0	0.0	0.0	4.1
Inter-laboratory Duplicate- Groundwater Investigation																	
BH1M	Groundwater	<50	<60	<500	<500	<0.5	2.4	<0.5	<1.5	1	<0.1	<1	<1	<1	<0.1	5	24
GWQT1	Duplicate of BH1M	34	<50	<100	<100	<1	3	<1	<3	1	<0.1	<1	2	<1	<0.05	5	22
RPD (%)		**54.2**	NA	NA	NA	NA	22.2	NA	**NA**	0.0	0.0	0.0	**80.0**	0.0	**NA**	0.0	8.7
Rinsate Blanks																	
GQRB1	Groundwater Rinsate	<50	<60	<500	<500	<0.5	<0.5	<0.5	<1.5	<1	<0.1	<1	<1	<1	<0.1	<1	<5
Trip Blanks / Spikes																	
GWTB1	Groundwater Trip Blank	-	-	-	-	<0.5	<0.5	<0.5	<1.5	-	-	-	-	-	-	-	-
GWTS1	Groundwater Trip Spike	-	-	-	-	[98%]	[94%]	[99%]	[100%]	-	-	-	-	-	-	-	-

Indicates values where a single result is found to be less than detection, with the duplicate sample found to be over the detection limit.

RPD exceeds 30-50% range referenced from AS4482.1 (2005)

NOTE:

All soil results are reported in mg/kg . All water results are reported in µg/L.

* F1 = TRH C6-C10 less the sum of BTEX

** F2 = TRH >C10-C16 less naphthalene

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Appendix C – Plans of the Proposed Development

LEGEND:

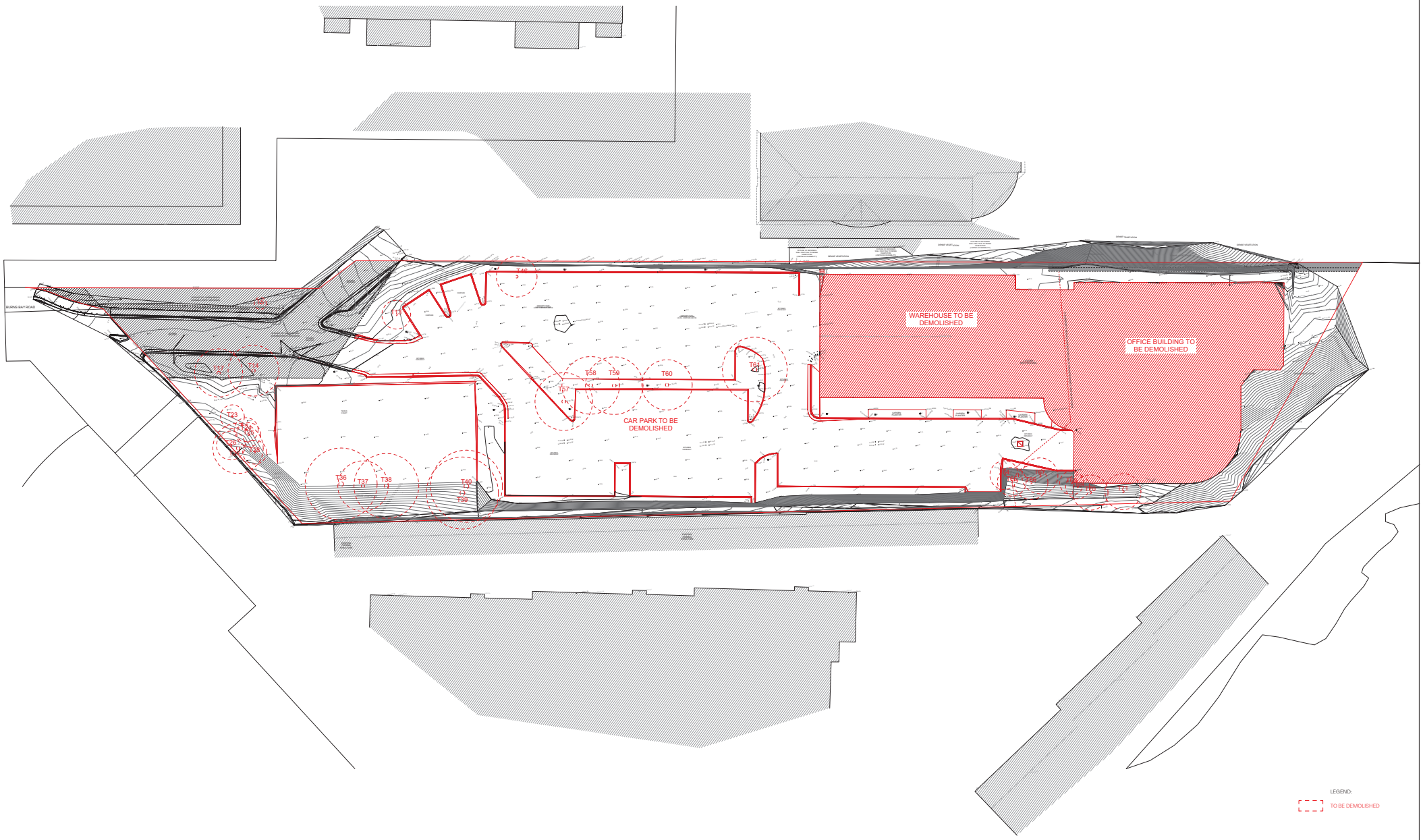
AW	AWNING
AH	ACCESS HATCH
AC	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
GC	GARBAGE CHUTE
HW	HIGHLIGHT WINDOW
MV	MECHANICAL RISER TO FUTURE DETAIL
MB	MAILBOX TO FUTURE DETAIL
SK	SKYLIGHT
STR	STORAGE
HWU	HOT WATER UNITS
(AH)	AFFORDABLE HOUSING UNITS

MATERIALS LEGEND:

AFG	ALUMINIUM FRAMED GLAZING
LV	ALUMINIUM ELLIPTICAL FIXED LOUVERS
AW	AWNING (TO FUTURE DETAIL)
CONC	CONCRETE
GB	FRAMELESS TOUCHENED GLASS BALUSTRADE (TO BCA/AUS STANDARDS)
MB	METAL BALUSTRADE
MC	METAL CLADDING
MF	METAL FENCING (TO FUTURE SELECTION)
PSx	PRIVACY SCREEN (TO FUTURE SELECTION)
PTx	PAINT FINISH TYPEx
RP	ROOF RIVER PEBBLES
RW	RENDERED FINISH/SELECTED PAINT FINISH

TREE LEGEND:

TREE TPZ



GENERAL NOTES:

- ALL WORKS TO COMPLY WITH BUILDING CODE OF AUSTRALIA, REQUIREMENTS OF RELEVENT STATUTORY AUTHORITIES/ LOCAL GOVERNMENT & RELEVENT AUSTRALIAN BUILDING STANDARDS
- DRAWINGS FOR THE PURPOSES OF DA ONLY NOT FOR CONSTRUCTION - FURTHER CONSULTANT/ AUTHORITY COORDINATION WILL BE REQUIRED AT CC STAGE WHICH MAY IMPACT ON DESIGN AND PLANNING LAYOUTS
- ARCHITECTURAL PLANS TO BE READ IN CONJUNCTION WITH CONSULTANTS DRAWINGS, SPECIFICATIONS & REPORTS
- COPYRIGHT OF DESIGN SHOWN HEREON IS RETAINED BY PBD ARCHITECTS AND AUTHORITY IS REQUIRED FOR ANY REPRODUCTION
- AREA SCHEDULES SUPPLIED ARE APPROXIMATE ONLY - FUTURE ALLOWANCE FOR VERTICAL SERVICE DUCTS, STRUCTURAL WALL SYSTEMS AND CONSULTANT INPUT WILL BE REQUIRED

Issue	Date	Description
01	30/01/2026	Issue For SSDA Submission

N

pbd architects

P - 02 9698 8140
E - info@pbdarchitects.com.au
W - pbdarchitects.com.au

Level 2, 52 Albion Street,
Surry Hills NSW 2010

ABN 36 147 035 550
Nominated Architect:
Paul Buljevic NSW 7768

PROJECT:
PROPOSED RESIDENTIAL FLAT BUILDING
300 Burns Bay Road, Lane Cove, NSW 2066

CLIENT:
Lane Cove Developments No.1 Pty Ltd

DRAWING TITLE:
Demolition Plan

DRAWING BY: AL,HK	CHECKED BY: KS	DATE: 30/01/2026
SCALE: 1:300@A1	DRAWING NO: **DA002**	ISSUE: **01**
PROJECT NO: 2424		

LEGEND:

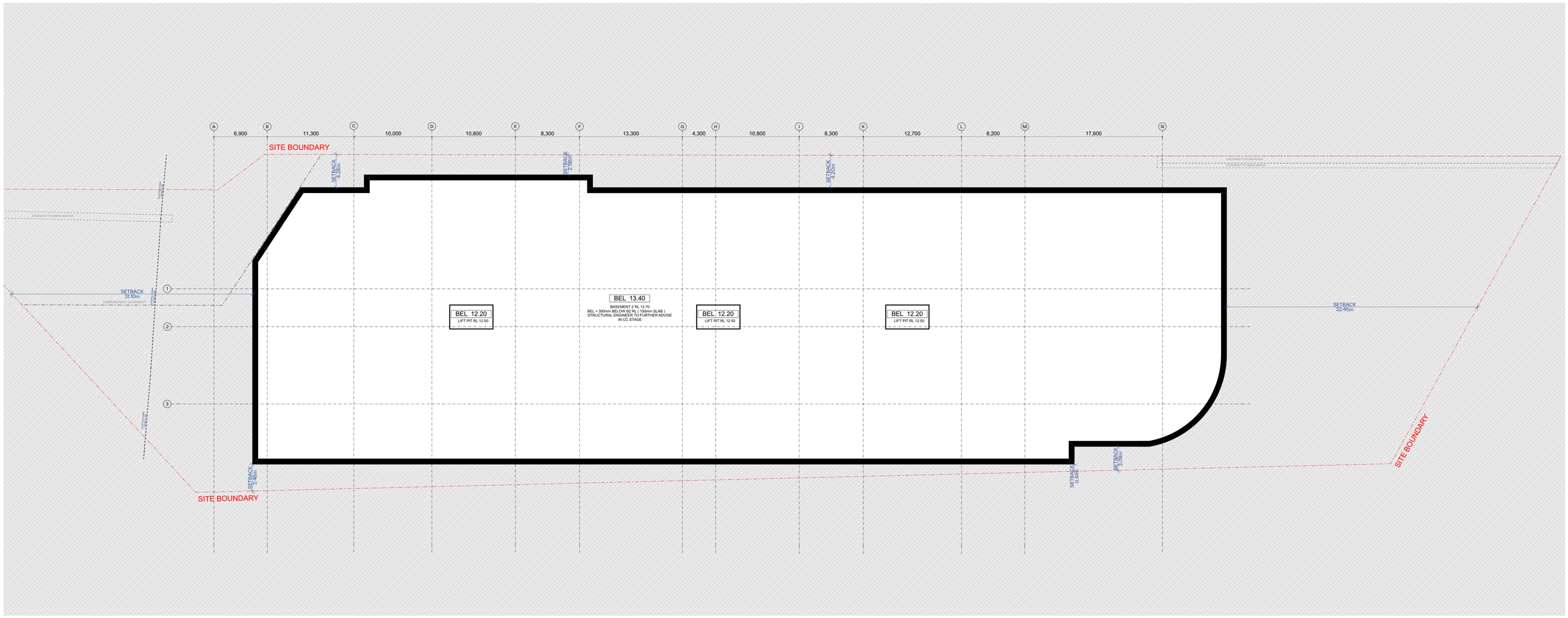
AW	AWNING
AH	ACCESS HATCH
AC	A/C CONDENSER UNITS
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FS	FIRE STAIRS
GC	GARBAGE CHUTE
HW	HIGHLIGHT WINDOW
MV	MECHANICAL RISER TO FUTURE DETAIL
MB	MAILBOX TO FUTURE DETAIL
SK	SKYLIGHT
STR	STORAGE
HWU	HOT WATER UNITS
(AH)	AFFORDABLE HOUSING UNITS

MATERIALS LEGEND:

AFG	ALUMINIUM FRAMED GLAZING
LV	ALUMINIUM ELLIPTICAL FIXED LOUVERS
AW	AWNING (TO FUTURE DETAIL)
CONC	CONCRETE
GB	FRAMELESS TOUCHENED GLASS BALUSTRADE (TO BCA/AUS STANDARDS)
MB	METAL BALUSTRADE
MC	METAL CLADDING
MF	METAL FENCING (TO FUTURE SELECTION)
PSx	PRIVACY SCREEN (TO FUTURE SELECTION)
PTx	PAINT FINISH TYPEx
RP	ROOF RIVER PEBBLES
RW	RENDERED FINISH/SELECTED PAINT FINISH

TREE LEGEND:

TREE TPZ



DRAFT

GENERAL NOTES:

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Issue	Date	Description
A	11/02/2026	Issue For Information

N

pbd architects

P - 02 9698 8140
E - info@pbdarchitects.com.au
W - pbdarchitects.com.au

Level 2, 52 Albion Street,
Surry Hills NSW 2010

ABN 36 147 035 550
Nominated Architect:
Paul Bujevic NSW 7768

PROJECT:
PROPOSED RESIDENTIAL FLAT BUILDING
300 Burns Bay Road, Lane Cove, NSW 2066

CLIENT:
Lane Cove Developments No.1 Pty Ltd

DRAWING TITLE:
Bulk Excavation Plan

DRAWING BY: AL,HK	CHECKED BY: KS	DATE: 11/02/2026
SCALE: 1:250@A1	DRAWING NO: **DA800**	ISSUE: **A**
PROJECT NO: 2424		

Appendix D – Results from the Registered Bore Search

WaterNSW

Rivers and Streams
favourites | search | download sites
find a site
⊞ Real Time Data - Rivers And Streams

Daily River Reports
⊞ Daily River Reports

Dams
favourites | search | download sites
find a site
⊞ Real Time Data - Major Dams

Groundwater (Telemetered data)
favourites | search | download sites
find a site
⊞ Real Time Data - Bores

All Groundwater Site details
search | download sites | find a site
search by licence
⊞ All Groundwater Map

Meteorology
favourites | search | download sites
find a site
⊞ Real Time Data - Weather Stations

Hunter River Salinity Trading Scheme
Hunter River Salinity Trading Scheme

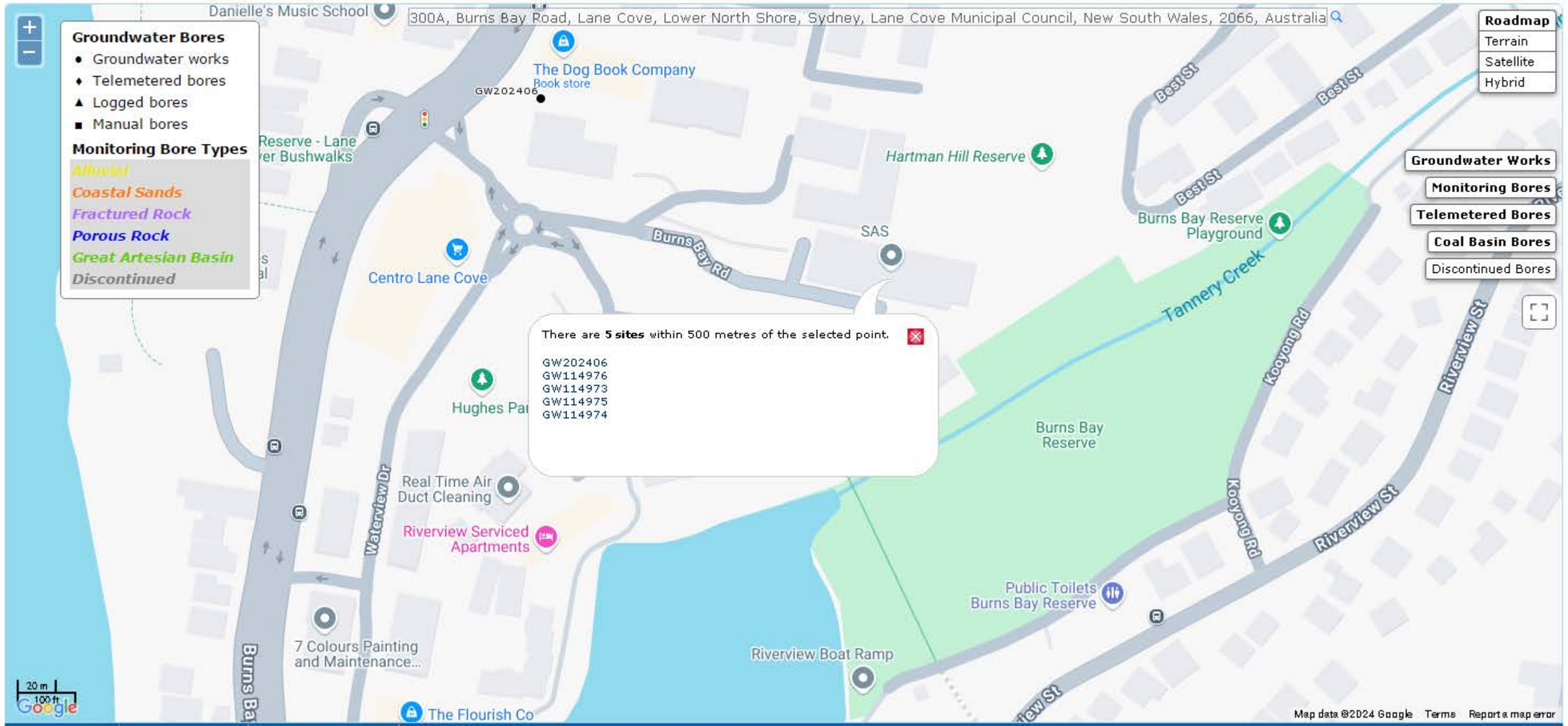
All Groundwater Site Details

ALL GROUNDWATER MAP

bookmark this page

All data times are Eastern Standard Time

Map | Info



WaterNSW
Work Summary

GW202406

Licence: 10BL604362
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 27/08/2010
Final Depth: 6.00 m
Drilled Depth: 6.00 m

Contractor Name: (None)
Driller: Yoon Fook Chin
Assistant Driller:

Property: SEDIMENTARY 284-288 Burns Bay Rd LANE COVE 2066 NSW
GWMA:
GW Zone:
Standing Water Level (m): 2.100
Salinity Description:
Yield (L/s): 40.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	WILLOUGHB	100//1176771
Licensed:	CUMBERLA	WILLOUGH	Whole Lot 11//843954

Region: 10 - Sydney South Coast
CMA Map: 9130-3N
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6256260.000
Easting: 328886.000
Latitude: 33°49'12.2"S
Longitude: 151°09'03.9"E

GS Map: -
MGA Zone: 56
Coordinate Source: GPS - Global

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	100			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.20	100	50		Graded, PL:Poured/Shovelled
1		Annulus	Bentonite/Grout	0.20	3.10	100	50		PL:Poured/Shovelled
1		Annulus	Waterworn/Rounded	3.10	6.00	100	50		Graded, PL:Poured/Shovelled
1	1	Casing	Steel Stainless 3	0.00	3.00	50	44		Cemented, Screwed
1	1	Opening	Screen - Wedge Wire	3.00	6.00	50		0	Stainless Steel 316, Screwed, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.10	6.00	3.90	Unknown	2.10	4.96	40.00		00:10:00	

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	Fill; Concrete	Fill	
0.20	0.65	0.45	Fill; Silty Sandy Clay, low plasticity, dark brown, fine to medium grained sand, with igneous gravel	Fill	
0.65	2.50	1.85	Sandstone; fine to coarse grained, orange & yellow	Sandstone	
2.50	4.00	1.50	Sandstone; as above, but light grey, brown & orange	Sandstone	
4.00	6.00	2.00	Sandstone; as above, but orange & grey	Sandstone	

Remarks

27/08/2010: Form A Remarks:
Nat Carling, 5-Oct-2012; Coordinates based on location map provided with the Form-A.
29/11/2012: Nat Carling, 29-Nov-2012; Attached correct licence, as directed.

***** End of GW202406 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114973

Licence: 10BL604670 **Licence Status:** CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date: **Final Depth:** 8.50 m
Completion Date: 08/06/2011 **Drilled Depth:** 8.50 m

Contractor Name: Numac
Driller: Matthew Stephen Moroney
Assistant Driller:

Property: WENZHOU PTY LIMITED 256 Burns Bay Rd LANE COVE 2066 NSW **Standing Water Level (m):** 2.770
GWMA: **Salinity Description:**
GW Zone: **Yield (L/s):**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	WILLOUGHB	12//320317
Licensed:	CUMBERLA	WILLOUGH	Whole Lot 12//320317

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6256550.000 **Latitude:** 33°49'02.8"S
Elevation Source: Unknown **Easting:** 328949.000 **Longitude:** 151°09'06.6"E

GS Map: - **MGA Zone:** 56 **Coordinate Source:** Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.39	0			Auger - Solid Flight
1	1	Casing	P.V.C.	0.00	0.00				

Remarks

08/06/2011: Form A Remarks:
Coordinates provided by LAS. L. Franchi.
12/08/2015: Nat Carling, 12-Aug-2015; Updated coordinate source & work type & added drilled depth to summary.

***** End of GW114973 *****

Warning To Clients: This raw data has been supplied to the WaterNSW by drillers, licensees and other sources. WaterNSW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

WaterNSW
Work Summary

GW114974

Licence: 10BL604670
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 08/06/2011
Final Depth: 8.50 m
Drilled Depth: 8.50 m

Contractor Name: Numac
Driller: Matthew Stephen Moroney
Assistant Driller:

Property: WENZHOU PTY LIMITED 256 Burns Bay Rd LANE COVE 2066 NSW
Standing Water Level (m):
GWMA:
Salinity Description:
GW Zone:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	WILLOUGHB	1//14919
Licensed:	CUMBERLA	WILLOUGH	Whole Lot 12//320317

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Grid Zone:
Scale:
Area/District:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6256575.000
Easting: 328933.000
Latitude: 33°49'02.0"S
Longitude: 151°09'05.9"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.50	100			Unknown
1	1	Casing	P.V.C.	0.00	0.00	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.10	0.10	CONCRETE	Fill	
0.10	0.20	0.10	FILL, SAND BROWN,M/GRAINED,DRY	Fill	
0.20	1.00	0.80	FILL, GRAVELLY CLAY BROWN SOFT,GRAVELS	Fill	
1.00	1.30	0.30	CLAY GREY WITH PURPLISH MOTTLING	Clay	
1.30	8.50	7.20	CLAY GREY WITH RED MOTTLING,DRY LOW PLASTICITY	Clay	

Remarks

08/06/2011: Form A Remarks:
Coordinates from LAS. L. Franchi
12/08/2015: Nat Carling, 12-Aug-2015; Updated coordinate source & work type & fixed rock type errors.

***** End of GW114974 *****

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WaterNSW
Work Summary

GW114975

Licence: 10BL604670
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 07/06/2011
Final Depth: 7.30 m
Drilled Depth: 7.30 m

Contractor Name: Numac
Driller: Unkown Unknown
Assistant Driller:

Property: WENZHOU PTY LIMITED 256 Burns Bay Rd LANE COVE 2066 NSW
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	WILLOUGHB	12//320317
Licensed:	CUMBERLA	WILLOUGH	Whole Lot 12//320317

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Grid Zone:
Scale:
Area/District:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6256547.000
Easting: 328928.000
Latitude: 33°49'02.9"S
Longitude: 151°09'05.7"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.30	100			Unknown
1	1	Casing	P.V.C.	0.00	0.00	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.10	0.10	CONCRETE	Fill	
0.10	0.20	0.10	FILL, SAND, LIGHT BROWN,M/GRAINED	Fill	
0.20	0.60	0.40	GRAVELLY CLAY, BROWN WITH GREY MOTTLING	Clay	
0.60	1.70	1.10	GRAVELLY CLAY GRET WHIT PURPLISH RED MOTTLING	Clay	
1.70	7.30	5.60	GRAVELLY CLAY GREY WITH DARK RED AND ORANGE MOTTLING	Clay	

Remarks

07/06/2011: Form A Remarks:
Coordinates provided by LAS.
12/08/2015: Nat Carling, 12-Aug-2015; Updated coordinate source & work type, fixed rock type errors & removed owner name from work name.

***** End of GW114975 *****

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WaterNSW
Work Summary

GW114976

Licence: 10BL604670
Licence Status: CANCELLED

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status: Equipped
Construct.Method: Auger - Solid
Owner Type: Private

Commenced Date:
Completion Date: 07/06/2011
Final Depth: 8.30 m
Drilled Depth: 8.30 m

Contractor Name: Numac
Driller: Unkown Unknown
Assistant Driller:

Property: WENZHOU PTY LIMITED 256 Burns Bay Rd LANE COVE 2066 NSW
Standing Water Level (m):
GWMA:
Salinity Description:
GW Zone:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	WILLOUGHB	12//320317
Licensed:	CUMBERLA	WILLOUGH	Whole Lot 12//320317

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Grid Zone:
Scale:
Area/District:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6256545.000
Easting: 328940.000
Latitude: 33°49'02.9"S
Longitude: 151°09'06.2"E

GS Map: -
MGA Zone: 56
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.30	100			Unknown
1	1	Casing	P.V.C.	0.00	0.00	50			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.10	0.10	CONCRETE	Fill	
0.10	0.20	0.10	FILL, SAND LIGHT BROWN,DRY,ORGANIC MATERIALS	Fill	
0.20	0.90	0.70	FILL,, CLAY, CRUSHED ASPHALT CHUNKS,GRAVELS,SAND DRY	Fill	
0.90	1.60	0.70	GRAVELLY CLAY,GREY WITH PURPLISH RED MOTTLING	Clay	
1.60	8.30	6.70	GRAVELLY CLAY GREY WITH DARK RED AND ORANGE MOTTLING,FIRM,DRY	Clay	

Remarks

07/06/2011: Form A Remarks:
Coordinates provided by LAS. L. Franchi
12/08/2015: Nat Carling, 12-Aug-2015; Updated coordinate source & work type, fixed rock type errors & removed owner name from work name.

***** End of GW114976 *****

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Appendix E – Groundwater Seepage Analysis and Groundwater Level Monitoring Report No. 1

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4 March 2026
E26484.G12.002

Claudine Malanum
Lane Cove Developments No. 1 Pty Ltd
30A Eva St,
RIVERWOOD NSW 2210

Groundwater Seepage Analysis
Proposed Development
300 Burns Bay Rd, Lane Cove, NSW

1 INTRODUCTION

At the request of Claudine Malanum on behalf of Lane Cove Developments No. 1 Pty Ltd (the Client), EI Australia (EI) has prepared this Groundwater Seepage Analysis (GSA) for the proposed Early Works at 300 Burns Bay Rd, Lane Cove, NSW (the site).

The following documents provided by the Client were used to assist in the preparation of this analysis:

- PDB Architects (2025) *Architectural drawings – 300 Burns Bay Road – Proposed Residential Flat Building*, Project No. 2424, Revision P3, dated 25 November 2025;
- Exceed Consulting Group (2024) *Site survey plan – 300 Burns Bay Road*, Referenced 240019-DETAIL-01[A], dated 30 May 2024.

The datum in the site survey (Exceed 2024) is in Australian Height Datum (AHD), hence all Reduced Levels (RL) mentioned in this report are henceforth in AHD.

EI has also prepared the following relevant reports for this site:

- Geotechnical Investigation (GI) report – Ref No. E26484.G03.002, dated 4 March 2026; and
- Groundwater Level Monitoring Report No. 1 – Ref No. E26484.G11.GW01, dated 9 July 2025.

This analysis supports an Early works State Significant Development Application (SSDA) (SSD-100293708) being lodged with the Department of Planning, Housing and Infrastructure (DHPI) for the demolition of all existing buildings and structures, excavation, augmentation of existing services and ground works at 300 Burns Bay Road, Lane Cove (the site) to enable the proposed redevelopment of the site for a residential development sought separately under SSD-87925706.

Based on the provided documents, EI understands that the proposed development (under SSD-87925706) involves the construction of a 7 to 15-storey residential flat building overlaying a two-level carpark basement. The existing structures in the eastern portion of the site will be retained. The lowest basement level is proposed to have a Finished Floor Level (FFL) of RL 13.70m AHD.

Under the proposed Early Works (SSD-100293708), shoring and bulk excavation will be undertaken to an assumed Bulk Excavation Level (BEL) of RL 13.40m AHD, which includes space allowance for the later construction of the basement slab. To achieve the BEL, excavation depths from 8.65m to 10.0m Below Existing Ground Level (BEGL) have been estimated. Locally deeper excavations may be required for footings, lift overrun pits, crane pads, and service trenches.

1.1 ASSESSMENT OBJECTIVES

The objective of this GSA is to provide an estimation of the groundwater take volumes that require pumping out during the excavation stages of the development, estimation of the groundwater drawdown as a result of the dewatering, and any associated ground settlements.

2 SITE MODEL

For the purpose of this assessment, the following sections were prepared and analysed, as part of the GSA report:

- **Section A-A** - This section is perpendicular to the northern elevation of the proposed excavation footprint. Due to the stepped nature of the site, this section is considered representative for groundwater inflow into the excavation from the northern, eastern, and western elevations.
- **Section B-B** - This section is perpendicular to the southern elevation of the proposed excavation footprint, where the elevation of the adjoining property is relatively lower than the proposed site's elevation. This section covers the groundwater inflow into the excavation from the southern elevation.

The proposed excavation footprint has a conservatively adopted BEL at RL 13.4 m AHD for the entire site. A plan showing the modelled sections location is attached in **Figure 1**.

2.1 SUBSURFACE CONDITIONS

The average subsurface conditions outlined in EI's GI were utilised in this analysis to model the geological subsurface conditions for these sections.

A summary of the permeability values which were adopted for the assessment of groundwater take volumes is presented in **Table 1**.

Table 1 Summary of Subsurface Conditions and Adopted Design Parameters

Unit	Material [1]	Approximate RL of Top of Unit (m AHD)		Adopted Permeability (m/s)	$k_{Vertical}/k_{Horizontal}$
		Section A-A	Section B-B		
1	Fill [2]	23.5	-	1.0×10^{-5}	1.0
2	Class V/IV Sandstone bedrock [3]	21.1	-	1.5×10^{-7}	0.7
3	Class III/II Sandstone bedrock [4]	19.8	17	8.5×10^{-8}	0.7

Notes:

1 For more detailed descriptions of subsurface conditions reference should be made to EI's GI report.
2 The permeability value for Unit 1 has been adopted based on the value suggested by Look (2014).
3 The permeability value for Unit 2 has been adopted based on the average values of pump-out test within BH2M and BH5M.
4 The permeability value for Unit 3 has been adopted based on the average values of all pump-out tests. The unit was assumed to be extended to the bottom of the model.

2.2 PERMEABILITY AND GROUNDWATER LEVEL OBSERVATIONS

As part of the EI's GI, four monitoring wells (BH1M, BH2M, BH3M, and BH5M) were installed for groundwater monitoring. EI carried out rising head tests within these wells on 26 September 2024. The test involves removing the water from the well and measuring the rise in water level within the well at regular time intervals. The data was then used to calculate the hydraulic conductivity of the bedrock layers using the Hvorslev method (results are presented graphically in **Appendix B**. A summary of the monitoring well details and rising head test results is presented in **Table 2**.

Table 2 Summary of Monitoring Well Details and Rising Head Test Results

Monitoring Well ID	Total Well Depth (m BEGL)	Screen Length (m)	Screened Section	Date of Test	Approximate RL of Groundwater Level (m AHD)	Calculated Permeability (m/s)
BH1M	8.0	3	Class III/II Sandstone	26 September 2024	20.11	4.68×10^{-9}
BH2M	5.0	3	Class V to IV Sandstone	26 September 2024	21.28	1.31×10^{-7}
BH3M	8.0	3	Class III/II Sandstone	26 September 2024	20.41	4.18×10^{-8}
BH5M	8.0	3	Class IV to III/II Sandstone	26 September 2024	16.84	1.60×10^{-7}

Groundwater levels were also measured manually at each monitoring well during various site visits, as summarised in **Table 3**.

Table 3 Summary of the Measured Groundwater Levels

Borehole ID	Surface RL (m AHD)	Groundwater Levels	
		Measurement Date	RL (m AHD)
BH1M	22.25	18/09/2024	20.27
		26/09/2024	20.11
BH2M	22.60	18/09/2024	21.38
		26/09/2024	21.28
BH3M	22.30	18/09/2024	20.61
		26/09/2024	20.41
BH5M	22.15	18/09/2024	16.93
		26/09/2024	16.84

Additionally, a long-term continuous groundwater monitoring using data loggers installed within the four monitoring wells was completed in BH1M, BH2M, BH3M, and BH5M from period 7 April 2025 to 8 July 2025. The full report and a summary of this continuous groundwater levels are provided in **Appendix C** and **Table 4**, respectively.

Table 4 Summary of Long-term Groundwater Monitoring

Monitoring Well/ Borehole ID	Average Groundwater RL (m AHD)	Highest Groundwater RL (m AHD)	Lowest Groundwater RL (m AHD)
BH1M	20.41	20.81	20.22
BH2M	21.46	21.65	21.34
BH3M	21.19	21.42	20.87
BH5M	16.77	16.96	16.68

Based on the measured groundwater levels above, the following design groundwater levels (GWL) for each section have been adopted for this analysis:

- **Section A-A** – A design GWL of RL 21.9 m AHD has been adopted for this analysed section. This value has considered possible seasonal variation of 0.5m above the highest water table encountered in BH2M on 18 September 2024. It is also consistent with the highest groundwater table observed during period from 7 April to 8 July 2025.
- **Section B-B** – A design GWL of RL 17.0 m AHD has been adopted for this analysed section. This value was conservatively estimated using the existing ground level of the neighbouring property to the south. This RL was used estimate the water inflow inward through the southern elevation of the proposed basement excavation.

2.3 THE MAXIMUM EXTENT OF THE CONE OF DEPRESSION

The estimated maximum extent of the cone of depression has been determined using Sichardt's Formula, as follows:

$$R = 3000\,(H - h)\sqrt{k}$$

Where:

- R = Maximum extent of the cone of depression (m).
- H = Highest design groundwater level (m).
- h = Estimated groundwater level at the BEL due to full duration of dewatering (m).
- k = Hydraulic conductivity of the aquifer (m/s).

The coefficient of 3000 is based on empirical observations, predominantly for sandy aquifers. The lowest coefficient outlined in Sichardt's formula is approximately 1000, which would result in a smaller radius of influence. Therefore, using a coefficient of 3000 in this case is considered conservative.

Based on the formula above, the maximum extent of the cone of depression is estimated to be approximately 9 m from the basement outline. However, to maintain conservatism in the model when predicting the effective drawdown radius and potential drawdown-induced settlement due to the full duration of dewatering for the proposed development, a wider maximum extent of the cone of depression of 20 m from the basement outline has been adopted in the numerical model.

2.4 SHORING SYSTEM

At the time of this assessment, no detailed structural designs were available. Hence, we have assumed a fully drained shoring wall system, and this has been adopted for the model.

This assessment does not assess the overall stability of the shoring system. Once final designs are made available, this assessment should be revised accordingly.

3 GROUNDWATER TAKE ASSESSMENT

3.1 GROUNDWATER SEEPAGE VOLUMES DURING CONSTRUCTION PHASE

Groundwater seepage analysis during excavation has been undertaken using PLAXIS 2D. PLAXIS 2D is a commercially available finite element package intended for the two dimensional analysis in geotechnical engineering. It is equipped with features to deal with various aspects of geotechnical structures and construction processes using robust and theoretically sound computational procedures. This model estimates the volume of water which will be required to be dewatered during the excavation of the basement footprint and until the dewatering is turned off.

For the purpose of this modelling, it has been assumed that:

- The subsurface conditions from **Table 1** are horizontal along each of the two representative sections.
- The permeability values presented in **Table 1** above were adopted for each unit.
- The shoring system is assumed as per Section 2.4 of this report.
- The base of the bulk excavation is assumed to be permeable and free to drain.
- For the simplicity of this model, temporary dewatering will be undertaken within the excavation retaining wall perimeter to the BEL or RL 13.4 m AHD.
- The design groundwater levels as provided at **Section 2.2** of this report were assumed to be constant at 20 m away from the shoring wall using Sichardt's (2007) formula, as outlined in **Section 2.3** of this report.
- A closed water boundary is defined along the symmetric line (the centre of the excavation), located 19.0m from the perimeter shoring wall for both sections.
- The bottom boundaries of Section A-A and Section B-B were set at RL 1.0 m AHD and RL 7.4 m AHD, respectively.
- Considering the simple geometry and relatively flat surface of the site, EI is of the opinion that the half-2D section using PLAXIS is appropriate in estimating the seepage volumes.
- The excavation perimeter for the estimated water inflow from northern, eastern, and western elevations into the proposed bulk excavation (for Section A-A) has a total length of approximately 210 m. Whilst, the perimeter for the estimated water inflow from the southern elevation has a total length of approximately 110 m.

The PLAXIS 2D model is presented in **Appendix A**. The below **Table 5** provides the estimated groundwater inflow rate into the excavation.

Table 5 Summary of Analysis Results

Section	Inflow into excavation (m^3/day) per m length	Inflow into excavation (m^3/day)	Total Inflow per year (ML/year)	Estimated Maximum Drawdown (m)
A-A	0.057	12.0	4.4	5.3
B-B	0.009	1.0	0.4	3.6
	Total	13.0	4.8	

For an estimation of the groundwater take during the operational phase of the proposed development, reference should be made to the Hydrogeological Report (E26484.E16_Rev2) provided for the main works (SSD-87925706). The Early Works (SSD-100293708) does not include an operational phase. As an indication, it is assumed that the basement will be designed as a drained structure and terefore, the estimated total inflow per year during the operational phase of the development is expected to be the same as during construction (about 4.8 ML per year).

3.2 GROUNDWATER DRAWDOWN AND DRAWDOWN INDUCED SETTLEMENT

Based on the analysis findings, the maximum predicted groundwater drawdown and its associated maximum ground settlement surrounding the basement boundary is approximately 5.3 m and 0.7 mm, respectively. The predicted groundwater drawdown may be used as a predetermined level for groundwater monitoring during the construction. In addition, the level of settlement is considered to pose a 'negligible' risk in terms of the category of damage risk due to dewatering, as defined by Cashman and Preene (2021), as shown in the excerpt in **Plate 1**. It should be noted that this predicted settlement accounts only for water drawdown and does not consider other factors, such as shoring wall deflection, surcharge loading, or other construction-related influences. A figure illustrating the estimated drawdown-induced settlement is provided in **Appendix A**.

Risk category[a]	*Maximum settlement (mm)*[b]	*Building tilt*[c]	*Anticipated effects*
Negligible	<10	<1/500	Superficial damage unlikely
Slight	10–50	1/500–1/200	Possible superficial damage; unlikely to have structural significance
Moderate	50–75	1/200–1/50	Expected superficial damage and possible structural damage to buildings; possible damage to rigid pipelines
Severe	75	>1/50	Expected structural damage to buildings and expected damage to rigid pipelines or possible damage to other pipelines

Source: Preene, M., *Proceedings of the Institution of Civil Engineers—Geotechnical Engineering*, 143(4), 177–190, 2000. With permission.

[a] The risk category is to be based on the more severe of the settlement or tilt criteria.
[b] Maximum settlement is based on the nearest edge of the structure to the groundwater control system.
[c] Tilt is based on rigid body rotation, assuming that all of the maximum settlement occurs as differential settlement across the width of the structure or across an element of the structure.

Plate 1 Excerpt from Cashman and Preene (2021)

Although the PLAXIS 2D modelling provides predicted drawdown-induced ground settlement values, it would be prudent for a thorough assessment of potential risks posed on neighbouring structures to be completed by a qualified and experienced structural engineer.

4 CONCLUSIONS AND COMMENTS

Based on the findings of this report and within the limitations of available data, EI concludes that:

- Excavation phase groundwater take will be approximately 4.8 ML per year.
- The above groundwater take estimates are based on the following assumptions:
  - The shoring wall system is a permeable system as per **Section 2.4** of this report;
  - Continuous dewatering in order to maintain the groundwater at BEL during excavation; and
  - This assessment does not take into consideration any excavation that may be required for footings, service trenches, lift pits, or crane pads. This additional excavation, if required, is not expected to affect the retention or the dewatering system.
- No operational phase is included with the Early Works. Notwithstanding, using a drained basement system the operational phase groundwater take is estimated to be identical to the excavation groundwater take, i.e. 4.8 ML per year.
- The maximum ground settlement due to the predicted groundwater drawdown behind the shoring wall (up to 20 m away from the shoring wall), is estimated to be approximately 0.7 mm. This settlement falls within the 'negligible' risk category for damage risk resulting from ground settlement due to dewatering, as per Cashman and Preene (2021). It would be prudent for potential risks to neighbouring structures to be assessed by a qualified and experienced structural engineer.

Should any design or excavation conditions differ from that adopted in this report; this GSA should be reviewed and updated as required.

5 LIMITATIONS

This report has been prepared for the exclusive use of Lane Cove Developments No. 1 Pty Ltd who is the only intended beneficiary of EI's work. The scope of the inspections carried out for the purpose of this report is limited to those agreed with Lane Cove Developments No. 1 Pty Ltd.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised in similar tasks by reputable members of the geotechnical industry in Australia as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices and attachments.

The conclusions presented in this report are based on a limited assessment of conditions, with specific locations chosen to be as representative as possible under the given circumstances.

EI's professional opinions are reasonable and based on its professional judgment, experience, training and results from analytical data. EI may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified by EI.

EI's professional opinions contained in this document are subject to modification if additional information is obtained through further investigation, observations, or validation testing and analysis during remedial activities. In some cases, further testing and analysis may be required, which may result in a further report with different conclusions.

6 CLOSURE

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of
EI Australia

Author	Technical Reviewer
Ernest Widjaja **Geotechnical Engineer**	**Huu Phuoc Dang** **Principal Design Engineer**

APPENDICES:
Figure 1 – Analysed Sections Plan
Appendix A – PLAXIS 2D Model and Results
Appendix B – Rising Head Permeability Tests
Appendix C – Groundwater Level Monitoring Report No. 1
Appendix D – Important Information

Figures

Figure 1 Analysed Sections Plan

Map Source:
NSW DCS Spatial DCS

LEGEND. Note: All locations are approximate

- Site Boundary
- Proposed Basement Boundary
- Basement perimeter covered by Section A-A GSA Analysis
- Basement perimeter covered by Section B-B GSA Analysis
- Borehole Location
- Monitoring Well Location

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Drawn:	G.B.
Approved:	H.D.
Date:	04/12/2025

Lane Cove Developments No.1 Pty Ltd

Groundwater Seepage Analysis

300 Burns Bay Road, Lane Cove, NSW

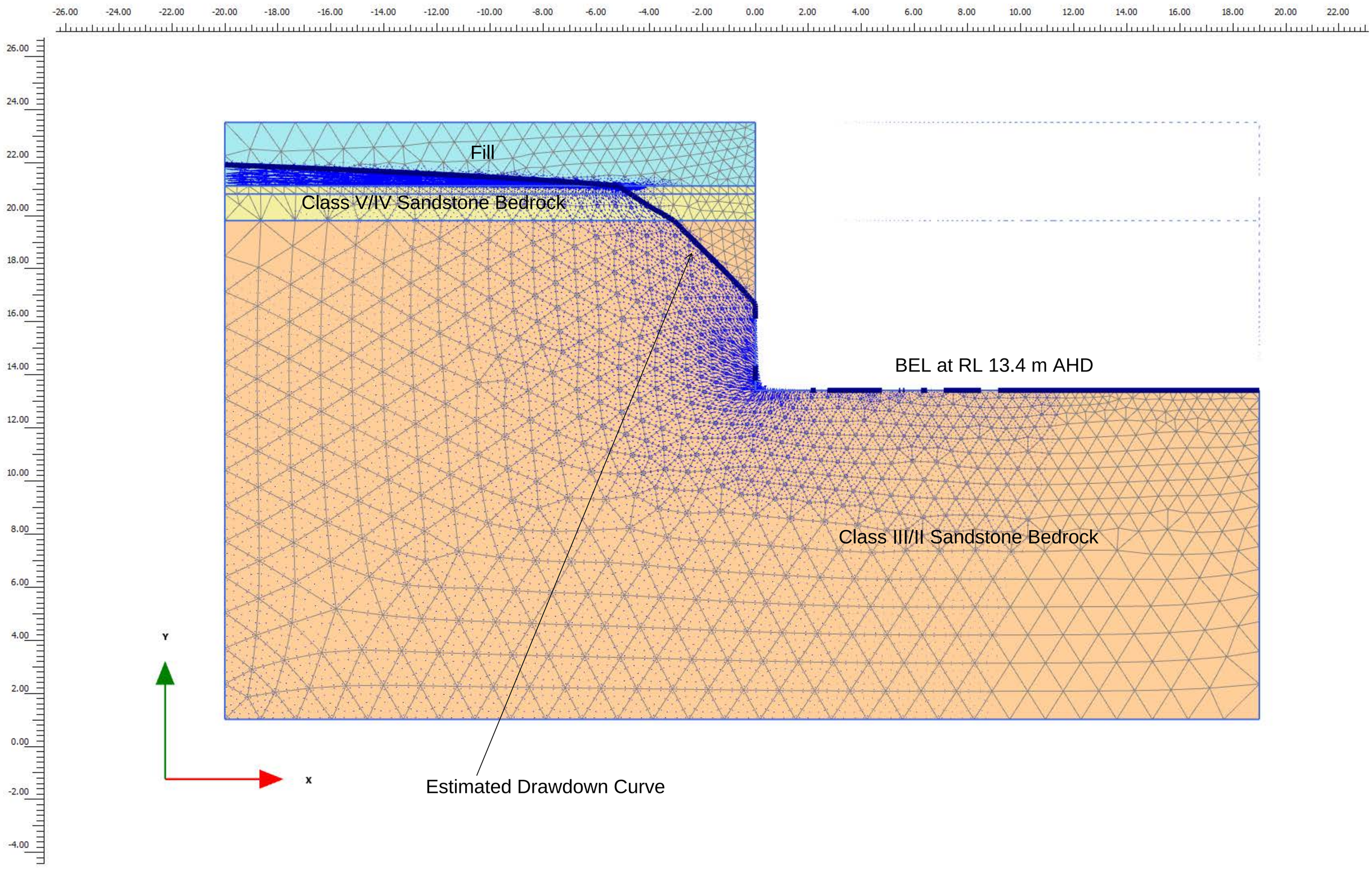
Analysed Section Plan

Figure: 1

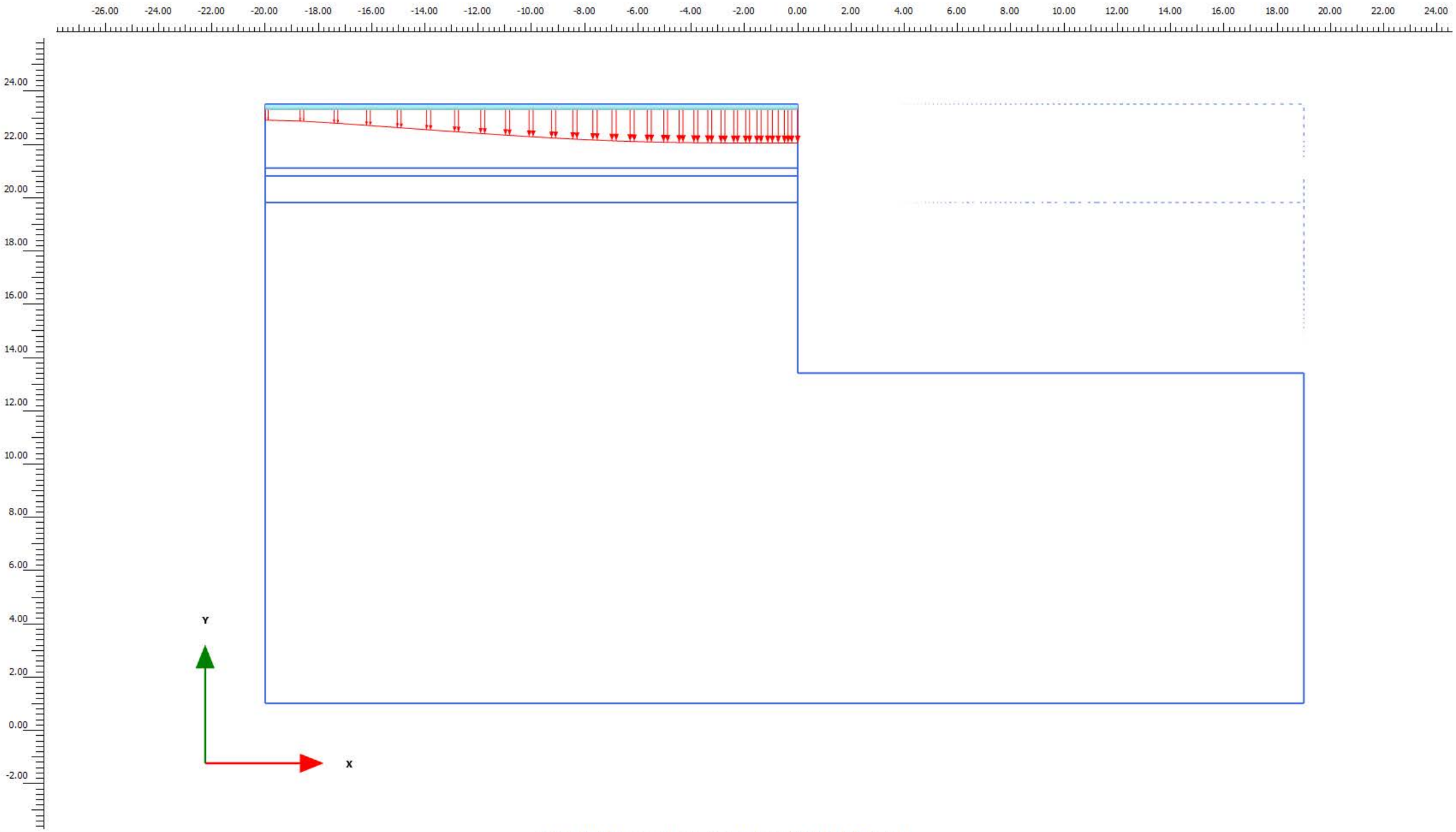
Project: E26484.G12

Appendix A – PLAXIS 2D Model and Results

Output Version 2024.2.0.1144



PLAXIS 2D	Project description: Groundwater Flow and Drawdown Curve for Section A-A		Date: 10/12/2025
	Project filename: E26484.G12.V1_GSA_Section A-A	Step: 5	Company: EI Australia



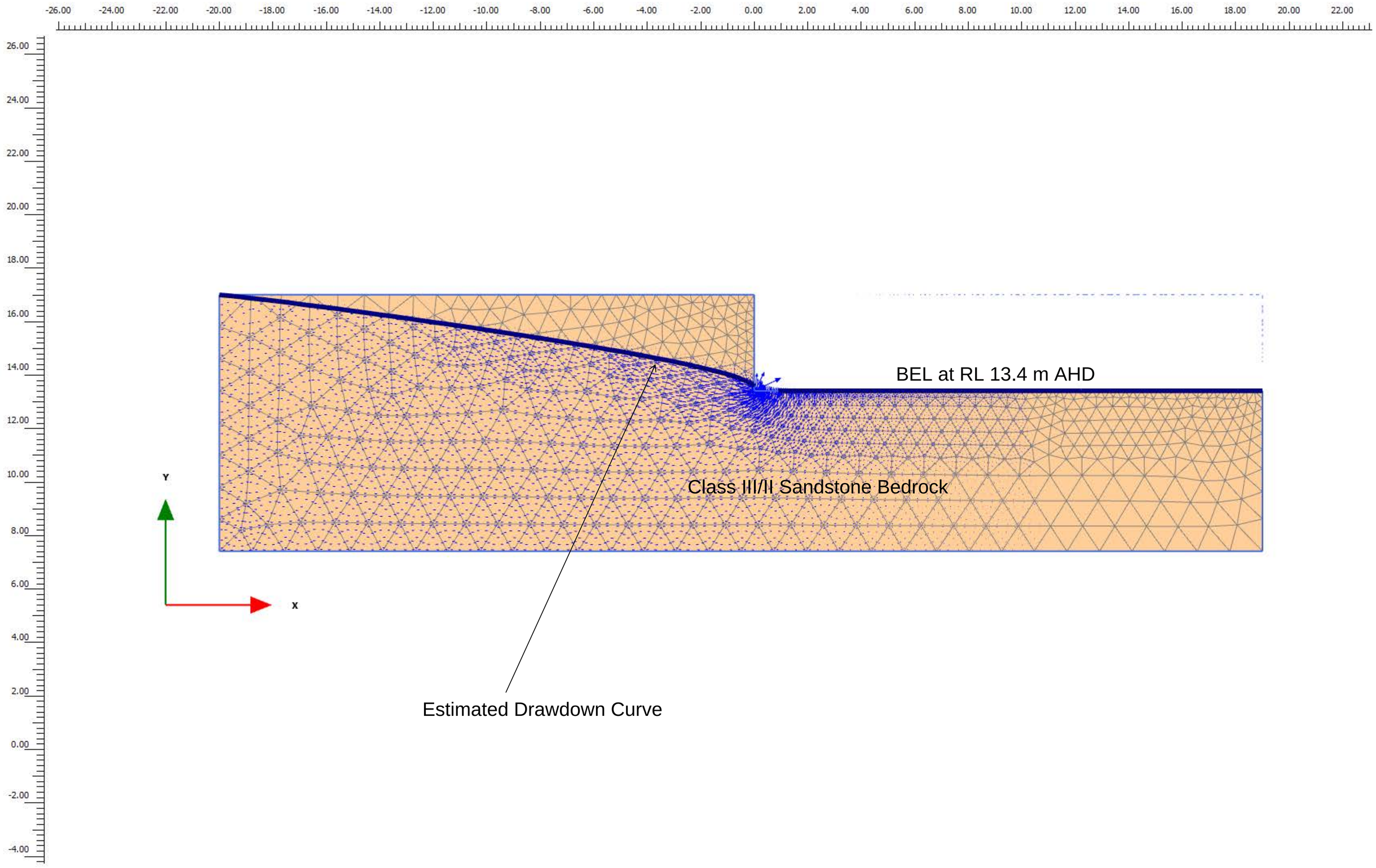
Total displacements u_y (scaled up $2.00*10^3$ times)

Maximum value = $-0.2402*10^{-3}$ m

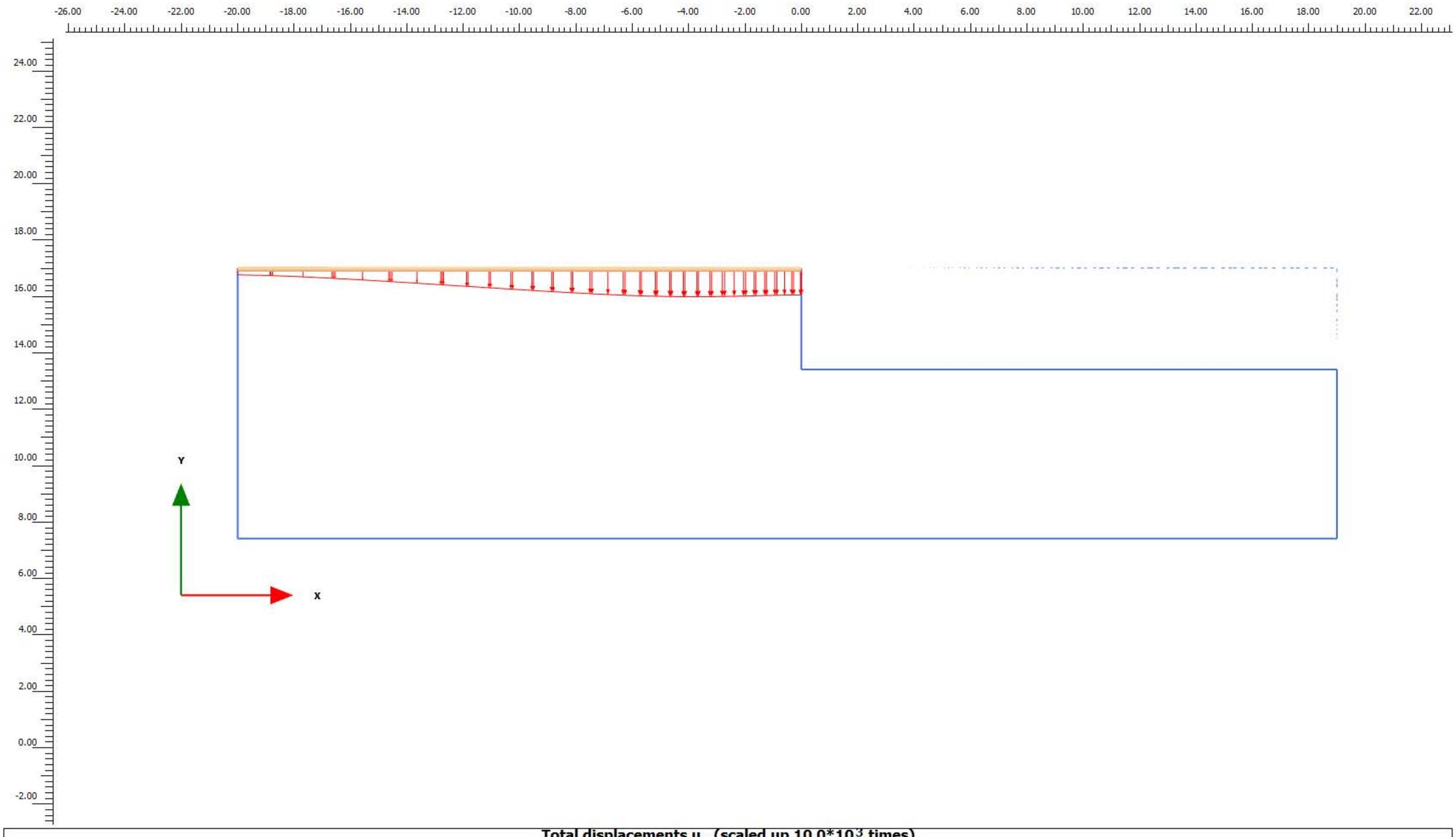
Minimum value = $-0.6704*10^{-3}$ m

PLAXIS 2D	Project description: Drawdown-Induced Settlements due to the Proposed Dewatering for Section A-A		Date: 10/12/2025
	Project filename: E26484.G12.V1_GSA_Section A-A	Step: 5	Company: EI Australia

Output Version 2024.2.0.1144



PLAXIS 2D	Project description: Groundwater Flow and Drawdown Curve for Section B-B		Date: 10/12/2025
	Project filename: E26484.G12.V1_GSA_Section B-B	Step: 5	Company: EI Australia



Total displacements u_y (scaled up $10.0*10^3$ times)

Maximum value = $-0.02048*10^{-3}$ m

Minimum value = $-0.09732*10^{-3}$ m

PLAXIS 2D	Project description: Drawdown-Induced Settlements due to the Proposed Dewatering for Section B-B		Date: 10/12/2025
	Project filename: E26484.G12.V1_GSA_Section B-B	Step: 5	Company: EI Australia

Appendix B – Rising Head Permeability Tests

Rising Head Permeability Test

EI Job No.	E26484.G12		Test Date	26/09/2024
By	KP		Location	300 Burns Bay Road, Lane Cove NSW

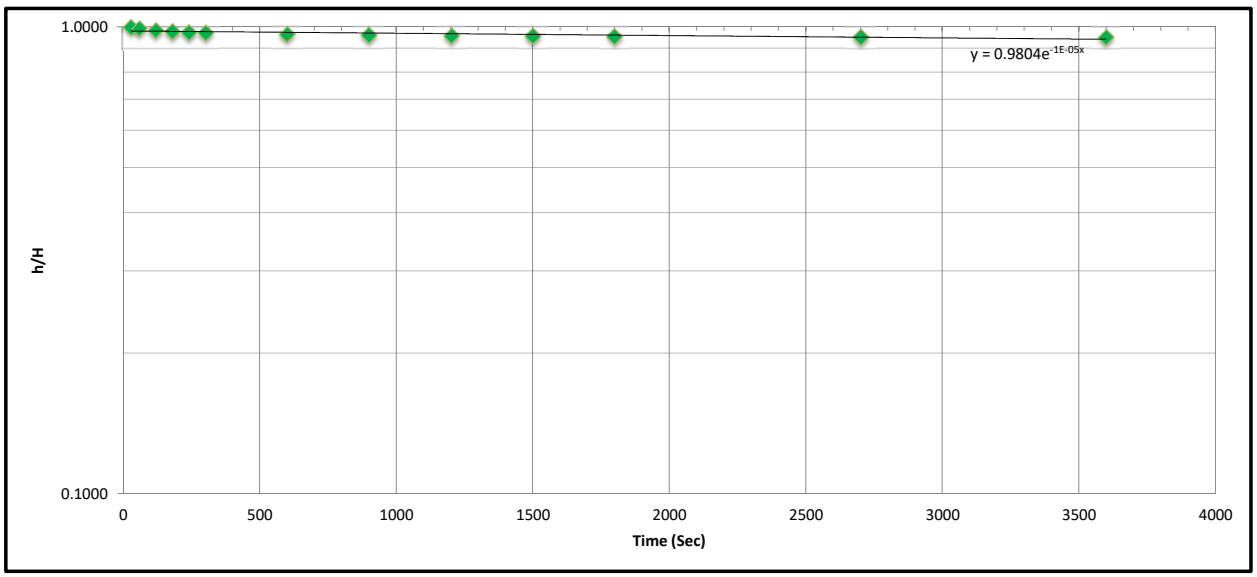
Borehole Detail

BH No.	BH1M
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radium (Auger Radius) (m)	0.038
Depth of the piezometer (m BGL)	8
Static Water Level (m BToC)	2.04
Lag time T0 (sec)	97210.98
Calculated Permeability k	**4.68E-09** m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			2.04		
0.5	30		7.74	5.70	1.0000
1	60		7.70	5.66	0.9935
2	120		7.64	5.60	0.9833
3	180		7.61	5.57	0.9779
4	240		7.59	5.55	0.9742
5	300		7.57	5.53	0.9710
10	600		7.53	5.49	0.9635
15	900		7.51	5.47	0.9608
20	1200		7.50	5.46	0.9582
25	1500		7.49	5.45	0.9566
30	1800		7.48	5.44	0.9549
45	2700		7.47	5.43	0.9533
60	3600		7.46	5.42	0.9512



Rising Head Permeability Test

EI Job No.	E26484.G12		Test Date	26/09/2024
By	KP		Location	300 Burns Bay Road, Lane Cove NSW

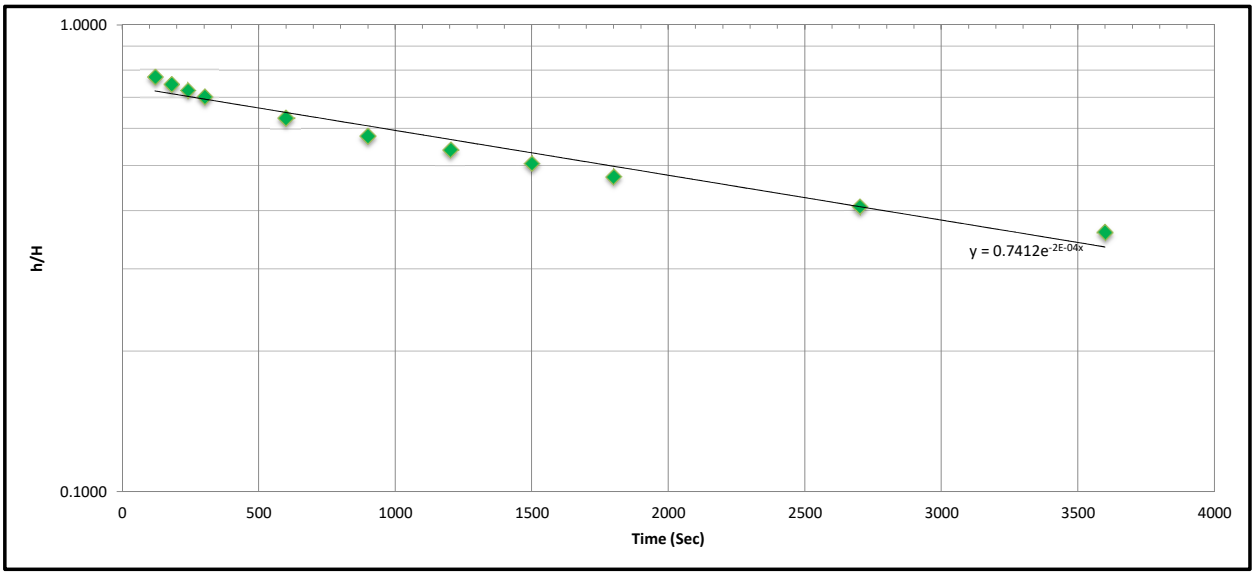
Borehole Detail

BH No.	BH2M
Casing Stick-up (m)	-0.1
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radium (Auger Radius) (m)	0.038
Depth of the piezometer (m BGL)	5
Static Water Level (m BToC)	1.22
Lag time T0 (sec)	3469.27
Calculated Permeability k	**1.31E-07** m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			1.22		
0	0		2.30	1.09	1.0000
1	60		2.12	0.90	0.8286
2	120		2.06	0.84	0.7724
3	180		2.03	0.81	0.7447
4	240		2.01	0.79	0.7244
5	300		1.98	0.76	0.7023
10	600		1.91	0.69	0.6323
15	900		1.85	0.63	0.5788
20	1200		1.80	0.59	0.5392
25	1500		1.77	0.55	0.5051
30	1800		1.73	0.52	0.4747
45	2700		1.66	0.44	0.4074
60	3600		1.61	0.39	0.3594



Rising Head Permeability Test

EI Job No.	E26484.G12		Test Date	26/09/2024
By	KP		Location	300 Burns Bay Road, Lane Cove NSW

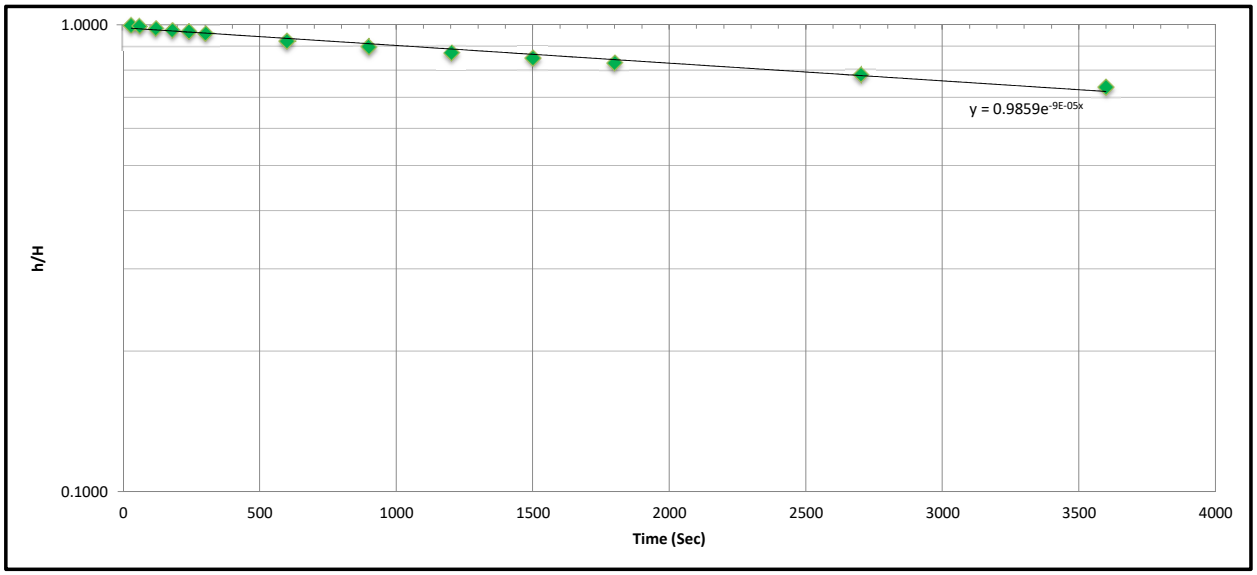
Borehole Detail

BH No.	BH3M
Casing Stick-up (m)	-0.13
Effective Piezo Screen Length (m)	3
Piezo Radius r (m)	0.025
Bore radium (Auger Radius) (m)	0.038
Depth of the piezometer (m BGL)	8
Static Water Level (m BToC)	1.74
Lag time T0 (sec)	10877.36
Calculated Permeability k	**4.18E-08** m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			1.74		
0.5	30		7.68	5.94	1.0000
1	60		7.64	5.90	0.9943
2	120		7.58	5.84	0.9840
3	180		7.54	5.80	0.9764
4	240		7.50	5.76	0.9697
5	300		7.45	5.71	0.9614
10	600		7.23	5.49	0.9243
15	900		7.07	5.33	0.8976
20	1200		6.93	5.18	0.8731
25	1500		6.79	5.05	0.8500
30	1800		6.68	4.93	0.8310
45	2700		6.38	4.64	0.7811
60	3600		6.11	4.37	0.7360



Rising Head Permeability Test

EI Job No.	E26484.G12		Test Date	26/09/2024
By	KP		Location	300 Burns Bay Road, Lane Cove NSW

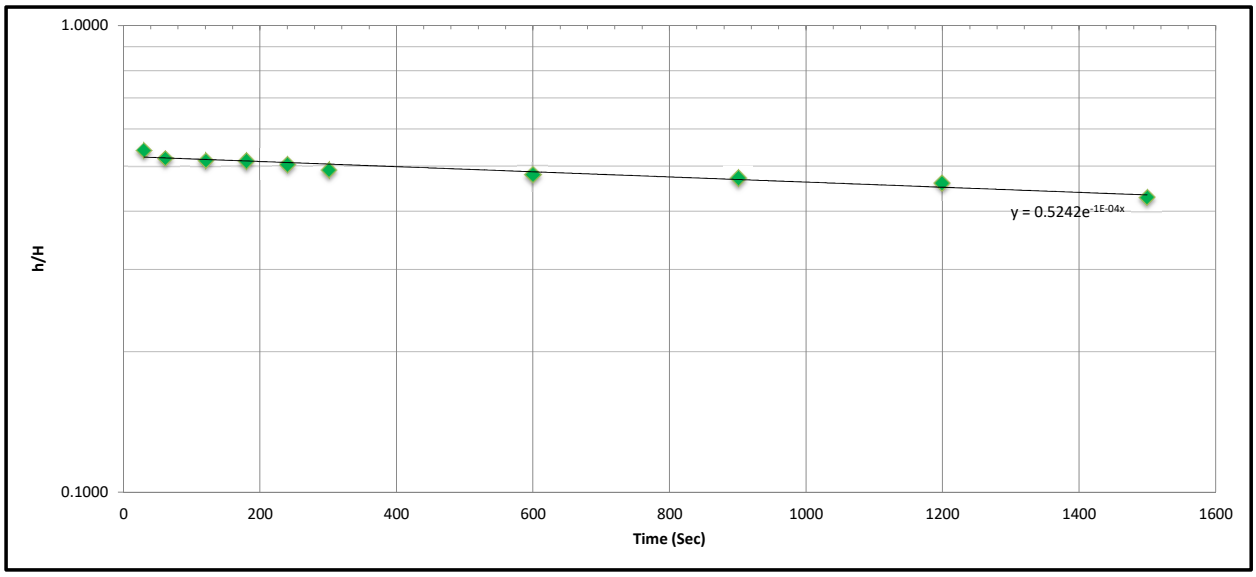
Borehole Detail

BH No.	BH5M
Casing Stick-up (m)	-0.13
Effective Piezo Screen Length (m)	2.69
Piezo Radius r (m)	0.025
Bore radium (Auger Radius) (m)	0.038
Depth of the piezometer (m BGL)	8
Static Water Level (m BToC)	5.18
Lag time T0 (sec)	3100.00
Calculated Permeability k	**1.60E-07** m/sec

Based on Hvorslev Method

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

Time (mins)	Time (sec)	Depth to water (ft BToC)	Depth to water (m BToC)	Change in Level (m)	h/H
Static			5.18		
0.5	30		6.28	1.10	1.0000
1	60		5.94	0.77	0.6948
2	120		5.77	0.60	0.5404
3	180		5.75	0.57	0.5204
4	240		5.75	0.57	0.5150
5	300		5.74	0.56	0.5123
10	600		5.73	0.56	0.5041
15	900		5.72	0.54	0.4905
20	1200		5.71	0.53	0.4796
25	1500		5.70	0.52	0.4705
30	1800		5.68	0.51	0.4596
45	2700		5.65	0.47	0.4296
60	3600		5.54	0.36	0.3270



Appendix C – Groundwater Level Monitoring Report No. 1

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9 July 2025
E26484.G11.GW01

Claudine Malanum
Lane Cove Developments No. 1 Pty Ltd
30A Eva Street
RIVERWOOD NSW 2210

Groundwater Level Monitoring Report No. 1
300 Burns Bay Road, Lane Cove NSW

EI Australia (EI) has been engaged to prepare this factual letter report to provide continual groundwater levels at the above site. The monitoring period in this report is from Monday 7 April 2025 to Tuesday 8 July 2025.

Groundwater levels were collected remotely during the monitoring period using data loggers installed within monitoring wells. The data logger / monitoring well details and the groundwater levels observed during the monitoring period are summarised in **Table 1** and **Table 2** below.

Table 1 Summary of Data Logger & Well Installation Details

Monitoring Well ID	Top of Well RL (mAHD)	Existing Ground RL (mAHD)	Well Stickup (m)	Well Depth Below Ground (m) [1]	Sensor RL (mAHD)
BH1M	22.26	22.36	-0.10	8.06	14.56
BH2M	22.58	22.68	-0.10	4.98	17.98
BH3M	22.17	22.32	-0.15	8.01	14.47
BH5M	21.97	22.11	-0.14	8.00	14.22

Note 1: The level of the bottom of the well is based on manual measurements after the well installation. The measurement accounts for any variation of the well depth caused by infilling of material through the well screen.

Table 2 Summary of Groundwater Levels

Monitoring Well ID	Average Groundwater RL (mAHD)	Highest Groundwater RL (mAHD)	Lowest Groundwater RL (mAHD)	Highest Groundwater Depth (m Below Ground)	Lowest Groundwater Depth (m Below Ground)
BH1M	20.41	20.81	20.22	1.55	2.14
BH2M	21.46	21.65	21.34	1.02	1.34
BH3M	21.19	21.42	20.87	0.90	1.45
BH5M	16.77	16.96	16.68	5.16	5.43

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of:
EI AUSTRALIA

Author

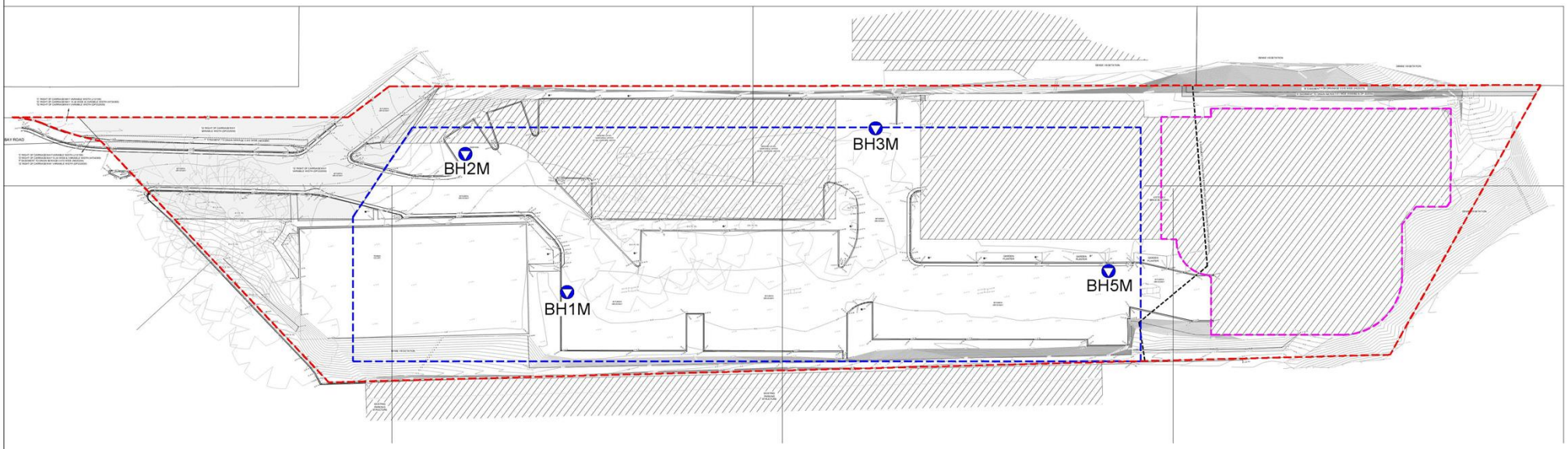
Kiengseng Pung
Geotechnical Engineer

Reviewer

Gregory Briscoe
Geotechnical Engineer | Project Manager

Attachments:

Figure 1: Data Logger Location Plan
Figure 2-5: Groundwater Level, Daily Rainfall vs. Time From 7 April 2025 to 8 July 2025
Important Information



Map Source: Detailed Survey Plan prepared by Exceed Consulting Group, Reference 240019-DETAIL-01[A], dated 16 May 2024

LEGEND (All Locations are Approximate)

- Site boundary
- Basement 2 boundary
- Retained existing building
- Borehole/monitoring well location (EI Australia, 2024)
- Borehole location (EI Australia, 2024)

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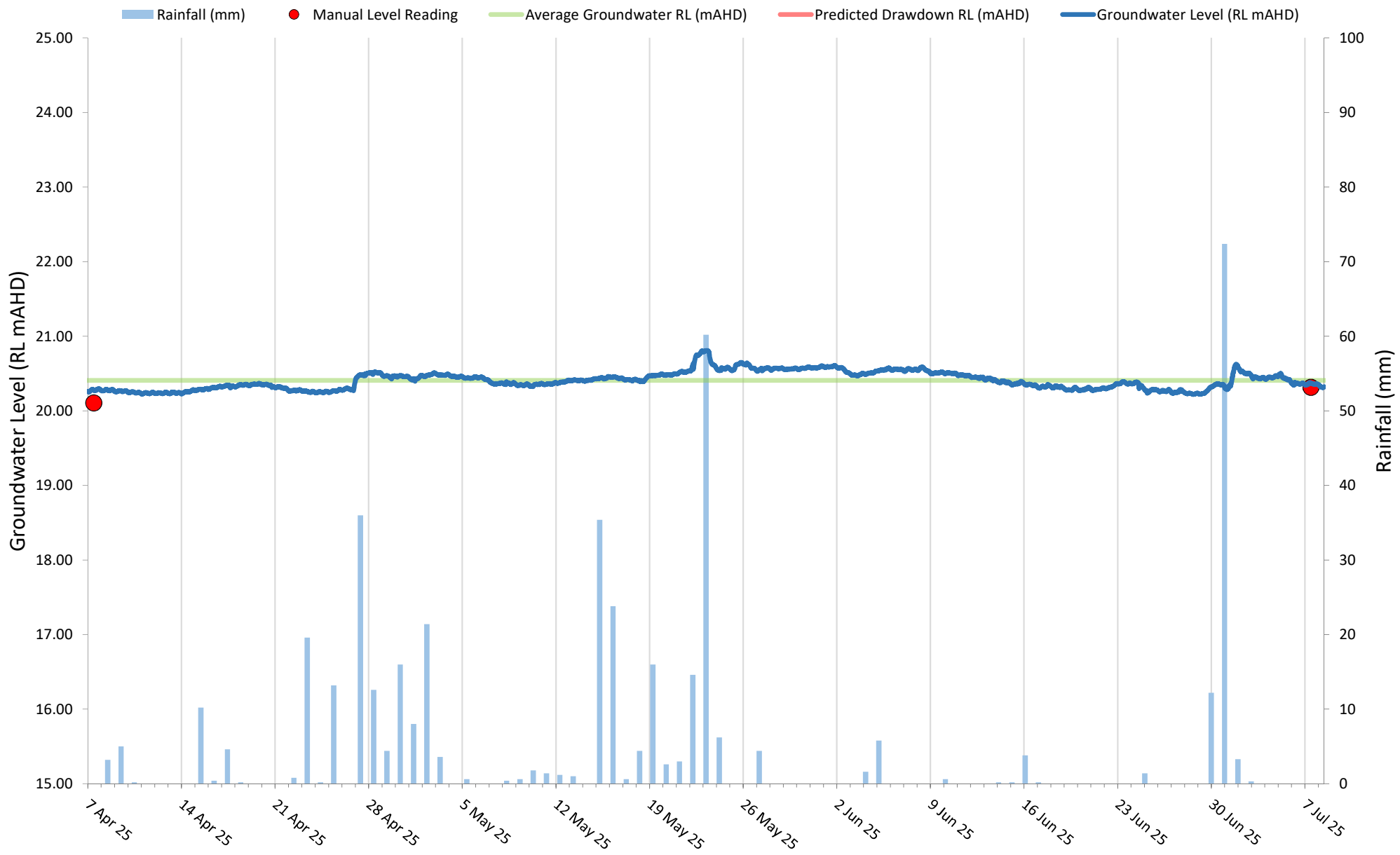
Drawn:	K.P.
Approved:	G.B.
Date:	10-07-25

Lane Cove Development No.1 Pty Ltd
Groundwater Level Monitoring
300 Burns Bay Road, Lane Cove NSW

Borehole Location Plan

Figure: 1

Project: E26484.G11



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Drawn:	KP
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Date:	9/07/2025

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Groundwater Level Monitoring

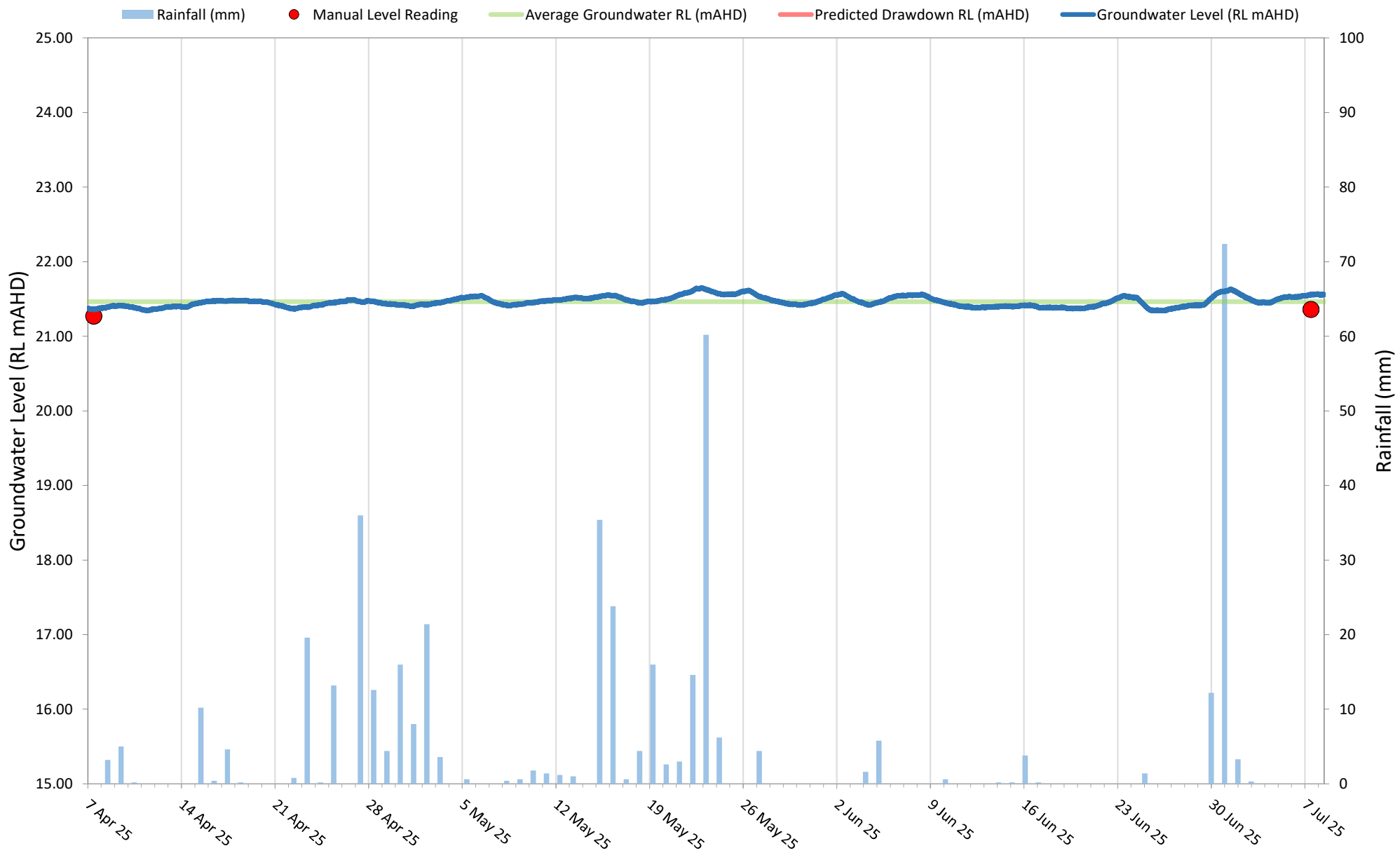
300 Burns Bay Road, Lane Cove NSW

BH1M

Figure:

2

Project: E26484.G11.GW01



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Groundwater Level Monitoring

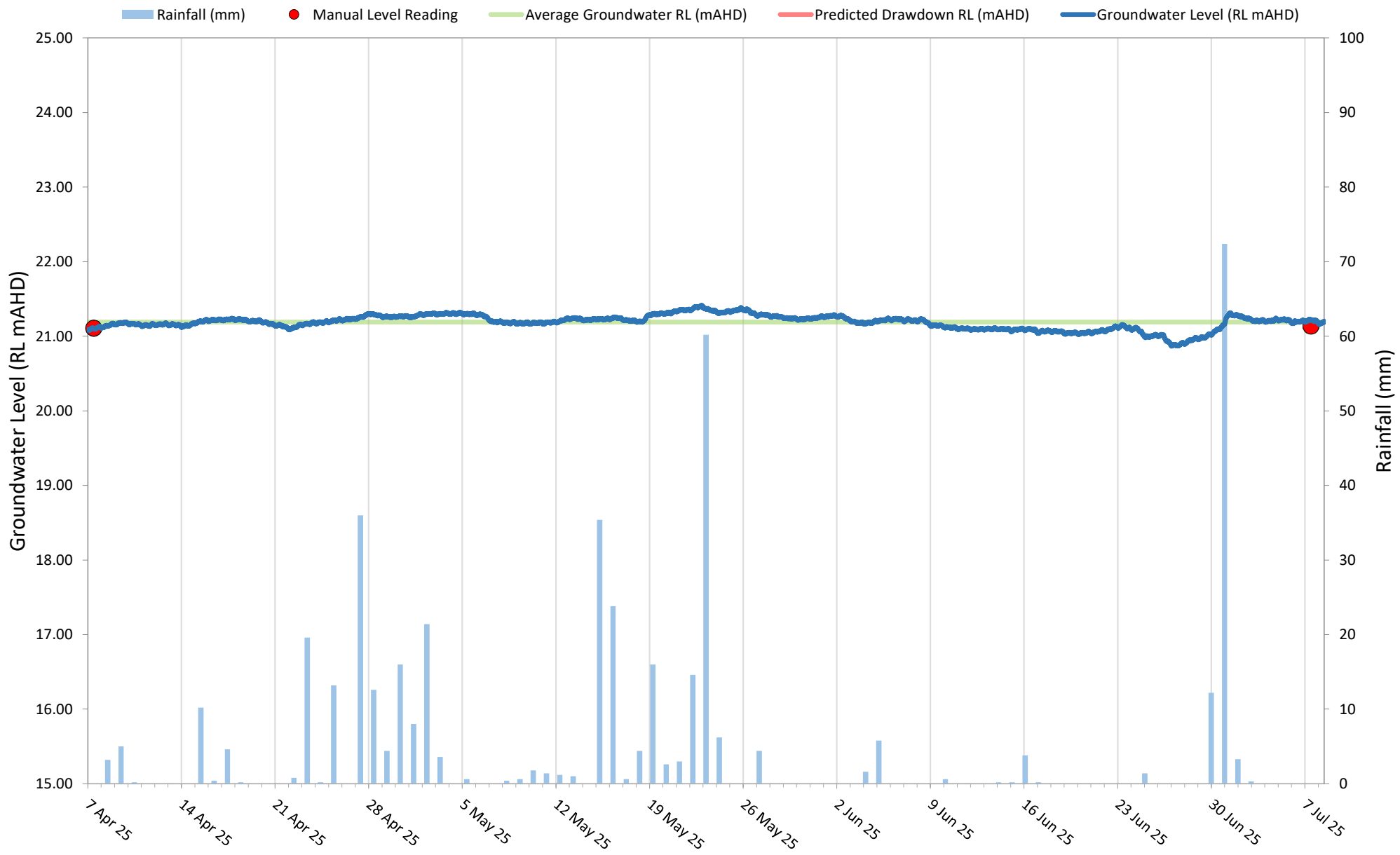
300 Burns Bay Road, Lane Cove NSW

BH2M

Figure:

3

Project: E26484.G11.GW01



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Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

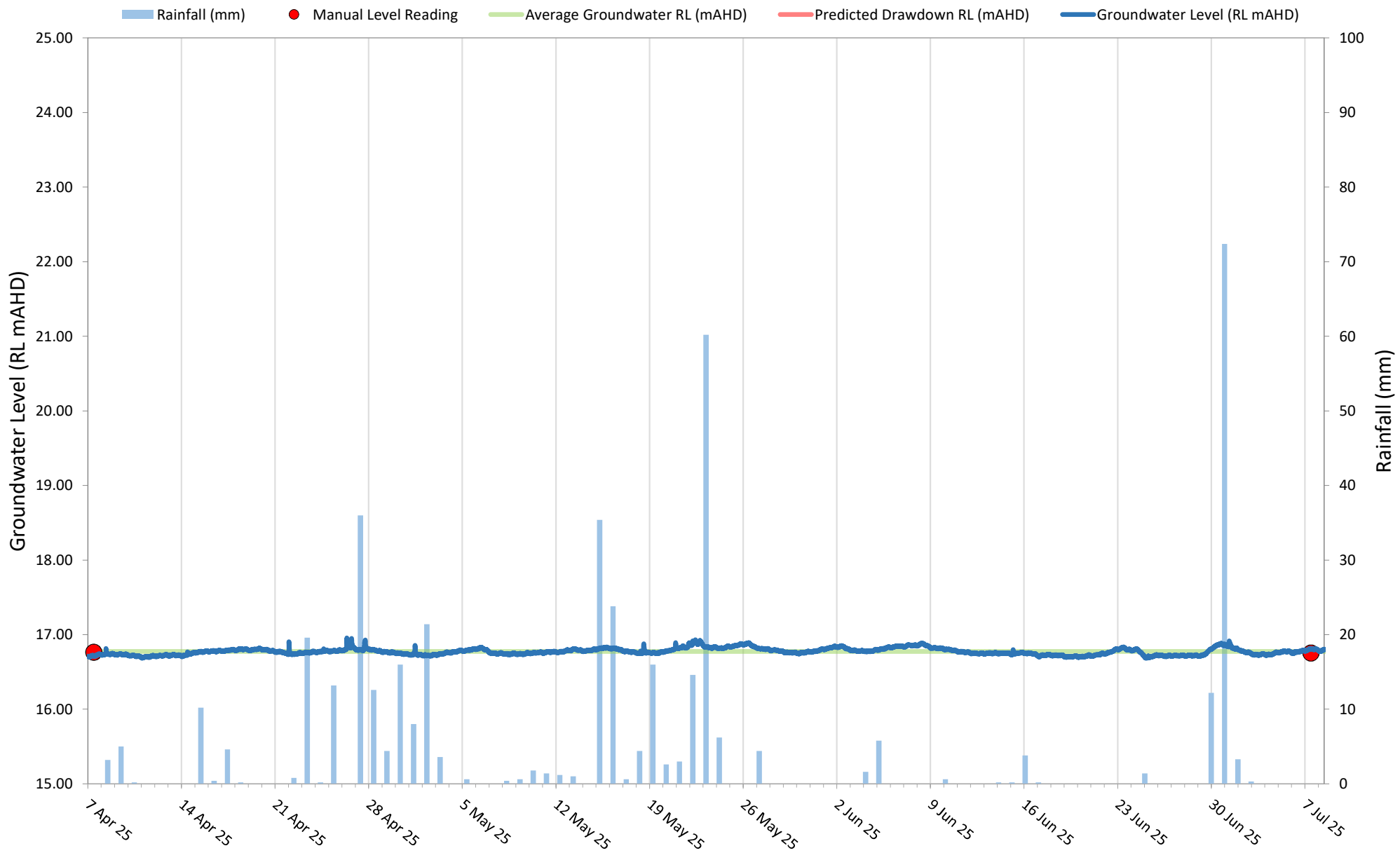
300 Burns Bay Road, Lane Cove NSW

BH3M

Figure:

4

Project: E26484.G11.GW01



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Drawn:	KP
Approved:	GB
Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

300 Burns Bay Road, Lane Cove NSW

BH5M

Figure:

5

Project: E26484.G11.GW01

Appendix D – Important Information

Important Information

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SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

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9 July 2025
E26484.G11.GW01

Claudine Malanum
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Groundwater Level Monitoring Report No. 1
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BH2M	22.58	22.68	-0.10	4.98	17.98
BH3M	22.17	22.32	-0.15	8.01	14.47
BH5M	21.97	22.11	-0.14	8.00	14.22

Note 1: The level of the bottom of the well is based on manual measurements after the well installation. The measurement accounts for any variation of the well depth caused by infilling of material through the well screen.

Table 2 Summary of Groundwater Levels

Monitoring Well ID	Average Groundwater RL (mAHD)	Highest Groundwater RL (mAHD)	Lowest Groundwater RL (mAHD)	Highest Groundwater Depth (m Below Ground)	Lowest Groundwater Depth (m Below Ground)
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BH2M	21.46	21.65	21.34	1.02	1.34
BH3M	21.19	21.42	20.87	0.90	1.45
BH5M	16.77	16.96	16.68	5.16	5.43

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of:
EI AUSTRALIA

Author

Kiengseng Pung
Geotechnical Engineer

Reviewer

Gregory Briscoe
Geotechnical Engineer | Project Manager

Attachments:

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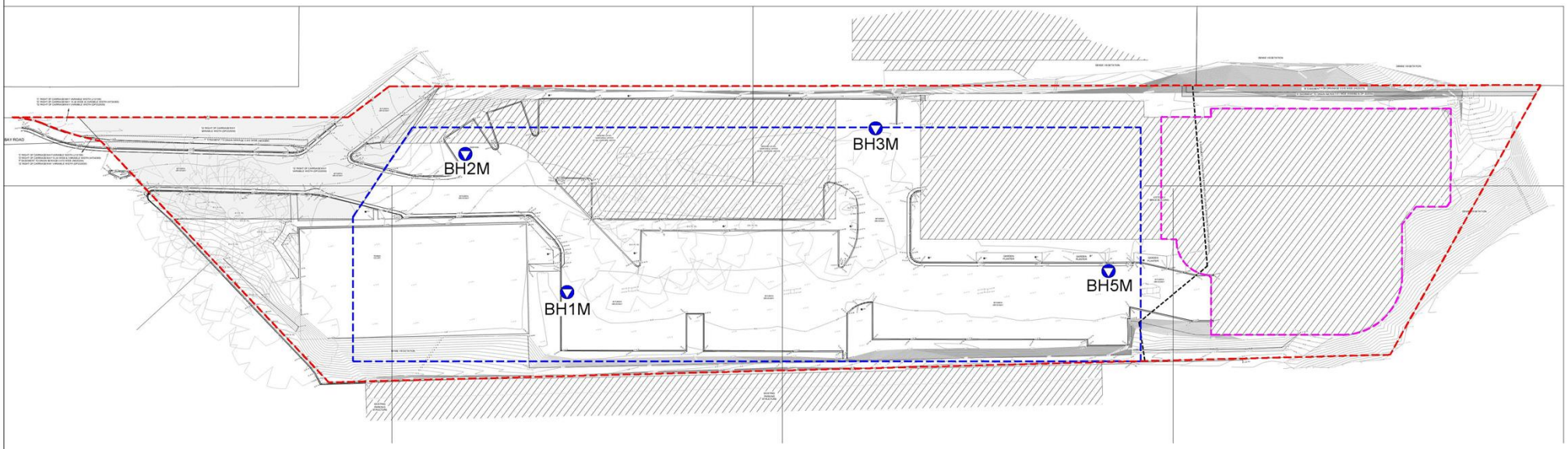
Figure 2-5: Groundwater Level, Daily Rainfall vs. Time From 7 April 2025 to 8 July 2025
Important Information



Map Source: Detailed Survey Plan prepared by Exceed Consulting Group, Reference 240019-DETAIL-01[A], dated 16 May 2024

LEGEND (All Locations are Approximate)

- Site boundary
- Basement 2 boundary
- Retained existing building
- Borehole/monitoring well location (EI Australia, 2024)
- Borehole location (EI Australia, 2024)

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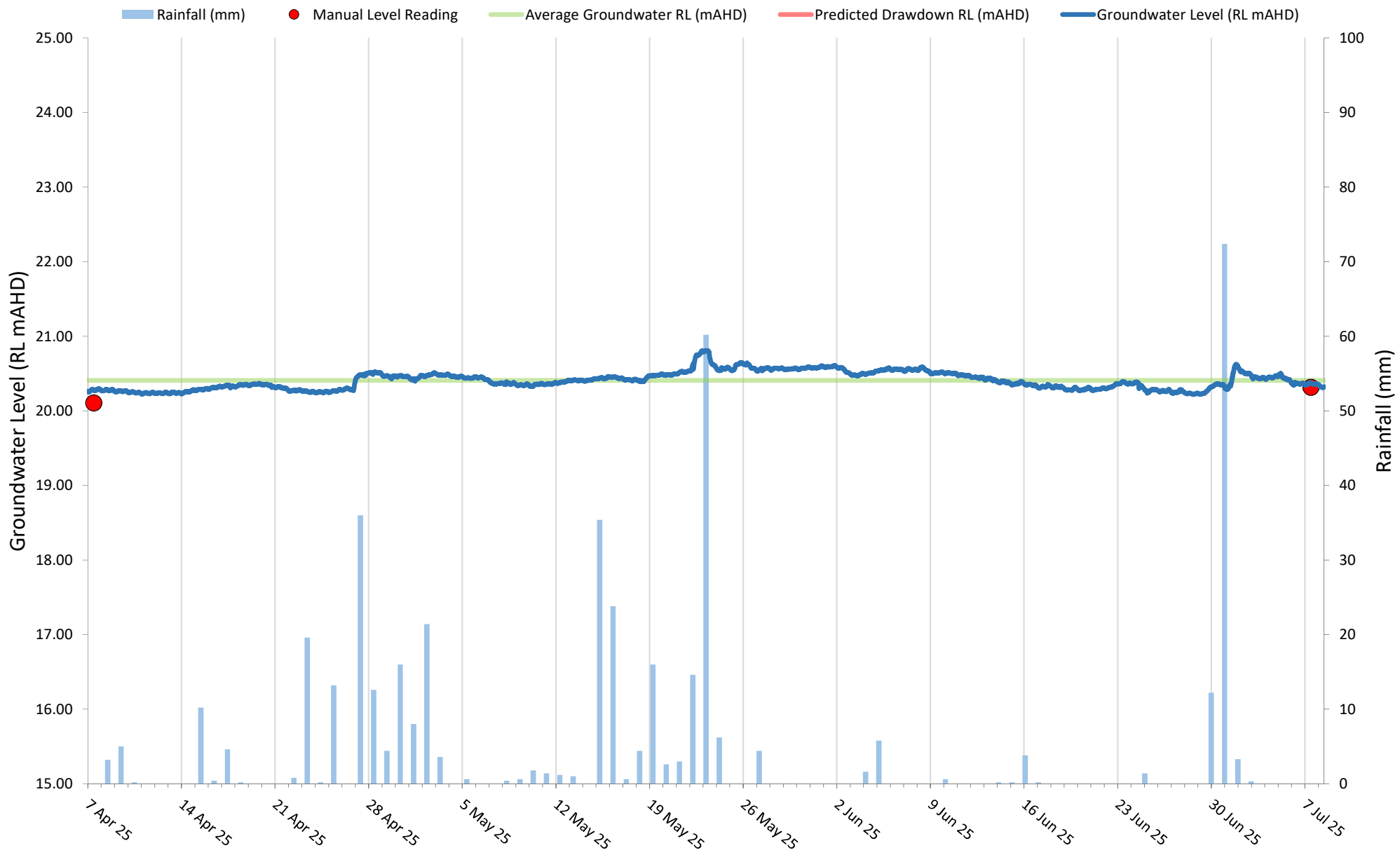
Drawn:	K.P.
Approved:	G.B.
Date:	10-07-25

Lane Cove Development No.1 Pty Ltd
Groundwater Level Monitoring
300 Burns Bay Road, Lane Cove NSW

Borehole Location Plan

Figure: 1

Project: E26484.G11



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Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

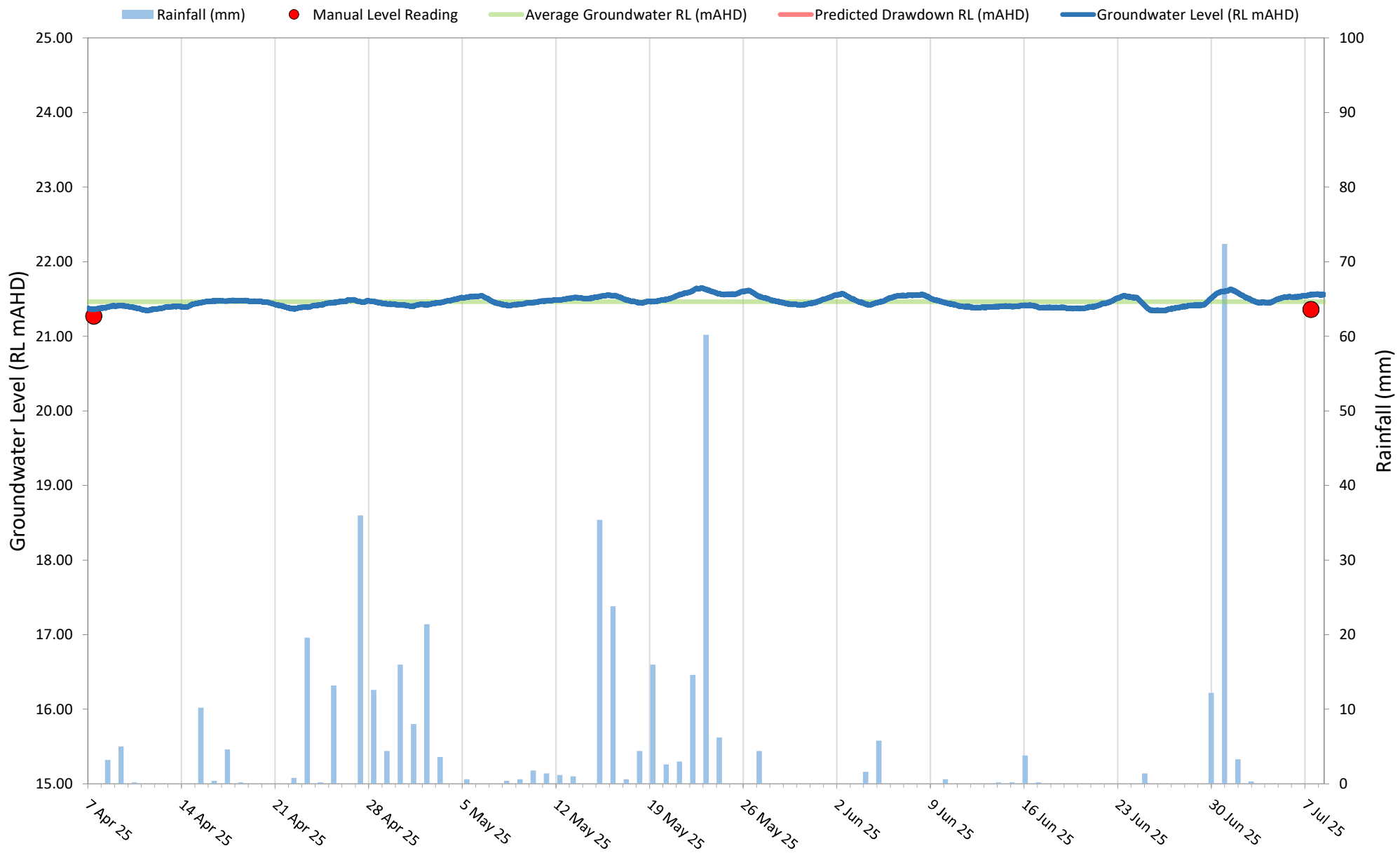
300 Burns Bay Road, Lane Cove NSW

BH1M

Figure:

2

Project: E26484.G11.GW01



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Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

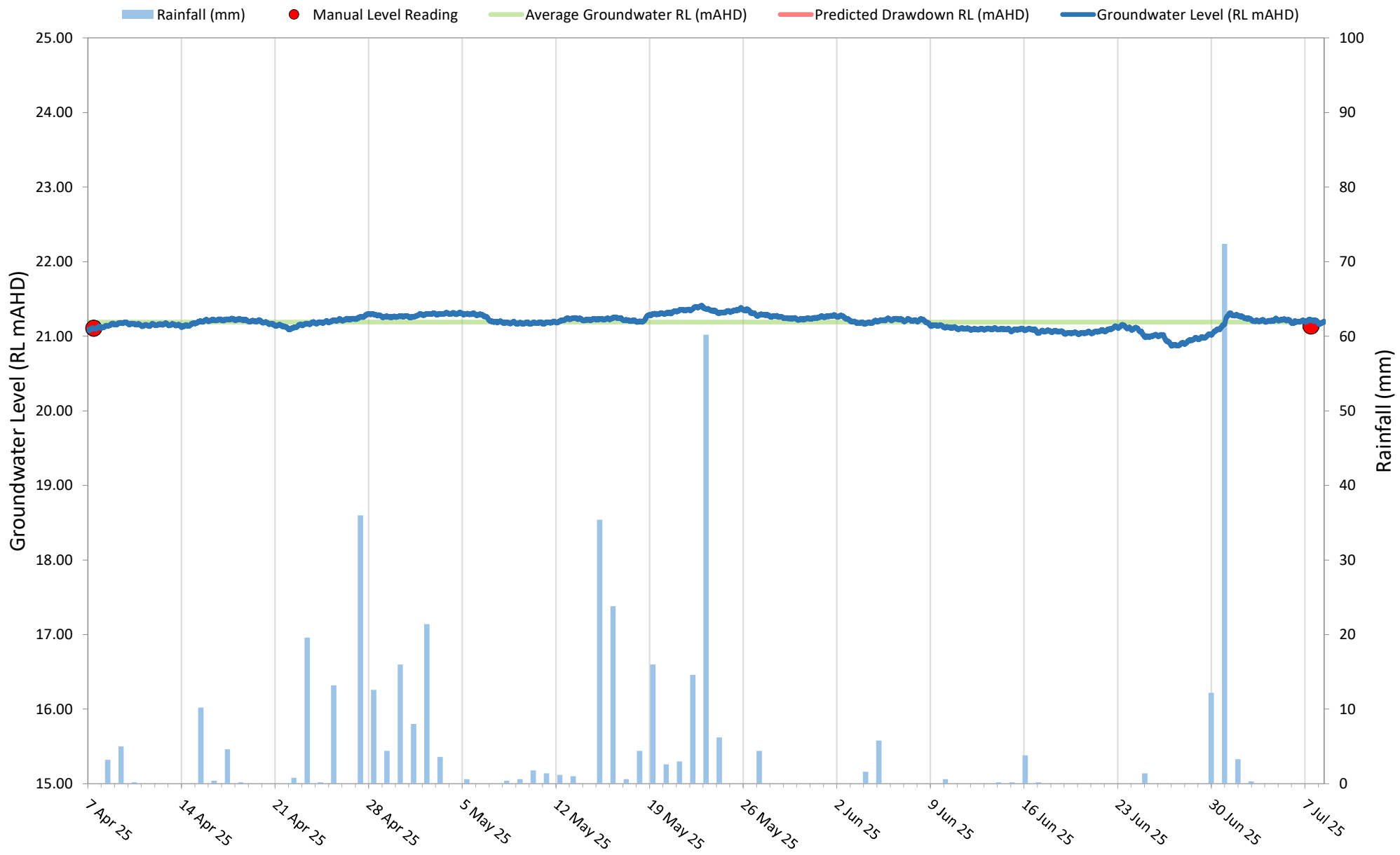
300 Burns Bay Road, Lane Cove NSW

BH2M

Figure:

3

Project: E26484.G11.GW01



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Drawn:	KP
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Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

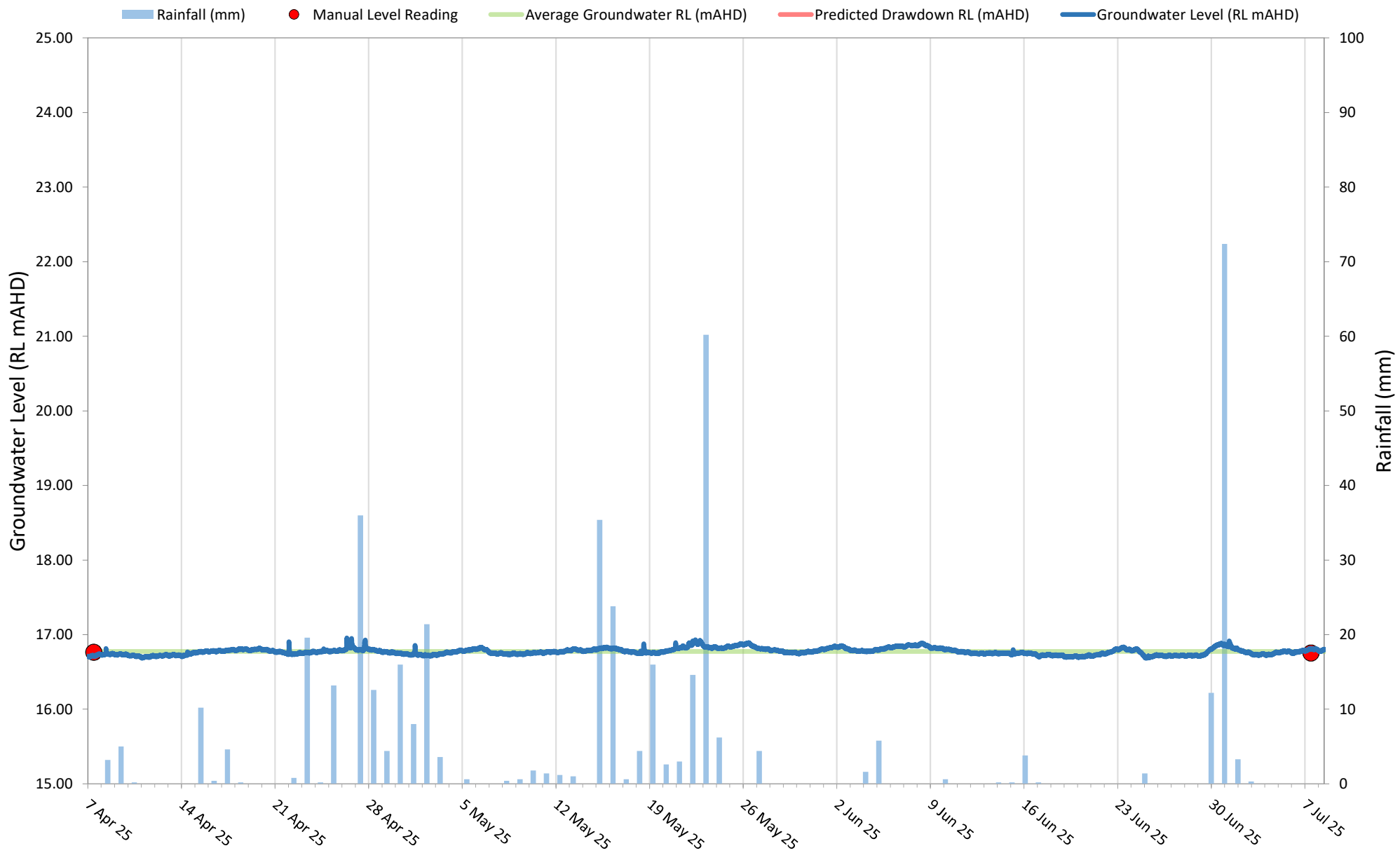
300 Burns Bay Road, Lane Cove NSW

BH3M

Figure:

4

Project: E26484.G11.GW01



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Drawn:	KP
Approved:	GB
Date:	9/07/2025

Lane Cove Developments No. 1 Pty Ltd

Groundwater Level Monitoring

300 Burns Bay Road, Lane Cove NSW

BH5M

Figure:

5

Project: E26484.G11.GW01

Important Information

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SCOPE OF SERVICES

The geotechnical report ("the report") has been prepared in accordance with the scope of services as set out in the contract, or as otherwise agreed, between the Client And EI Australia ("EI"). The scope of work may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

EI has relied on data provided by the Client and other individuals and organizations, to prepare the report. Such data may include surveys, analyses, designs, maps and plans. EI has not verified the accuracy or completeness of the data except as stated in the report. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations ("conclusions") are based in whole or part on the data, EI will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EI.

GEOTECHNICAL ENGINEERING

Geotechnical engineering is based extensively on judgment and opinion. It is far less exact than other engineering disciplines. Geotechnical engineering reports are prepared for a specific client, for a specific project and to meet specific needs, and may not be adequate for other clients or other purposes (e.g. a report prepared for a consulting civil engineer may not be adequate for a construction contractor). The report should not be used for other than its intended purpose without seeking additional geotechnical advice. Also, unless further geotechnical advice is obtained, the report cannot be used where the nature and/or details of the proposed development are changed.

LIMITATIONS OF SITE INVESTIGATION

The investigation programme undertaken is a professional estimate of the scope of investigation required to provide a general profile of subsurface conditions. The data derived from the site investigation programme and subsequent laboratory testing are extrapolated across the site to form an inferred geological model, and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the proposed development. Despite investigation, the actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The engineering logs are the subjective interpretation of subsurface conditions at a particular location and time, made by trained personnel. The actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions can be modified by changing natural forces or man-made influences. The report is based on conditions that existed at the time of subsurface exploration. Construction operations adjacent to the site, and natural events such as floods, or ground water fluctuations, may also affect subsurface conditions, and thus the continuing adequacy of a geotechnical report. EI should be kept appraised of any such events, and should be consulted to determine if any additional tests are necessary.

VERIFICATION OF SITE CONDITIONS

Where ground conditions encountered at the site differ significantly from those anticipated in the report, either due to natural variability of subsurface conditions or construction activities, it is a condition of the report that EI be notified of any variations and be provided with an opportunity to review the recommendations of this report. Recognition of change of soil and rock conditions requires experience and it is recommended that a suitably experienced geotechnical engineer be engaged to visit the site with sufficient frequency to detect if conditions have changed significantly.

REPRODUCTION OF REPORTS

This report is the subject of copyright and shall not be reproduced either totally or in part without the express permission of this Company. Where information from the accompanying report is to be included in contract documents or engineering specification for the project, the entire report should be included in order to minimize the likelihood of misinterpretation from logs.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the Client and no other party. EI assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EI or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own inquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

EI will not be liable to update or revise the report to take into account any events or emergent circumstances or fact occurring or becoming apparent after the date of the report.

Appendix F – Monitoring Bore Logs

BOREHOLE LOG

BH ID: BH1M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	09 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	09 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	09 September 2024
Sheets	1 of 3	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.25 m (AHD)	**Northing**	6256177.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328958.0000 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE	BH1M_0.50-0.95 SPT 0.50-0.95 4,4,2 N=6 BH1M_1.50-1.88 SPT 1.50-1.70 1,3/50 mm HB N=R		0 0.00 0.10 0.40 0.80 1 1.70 2 3 4 5 6 7 8 9 10		22.25 22.15 21.85 21.45 20.55	ASPHALT: 100mm thick FILL: Gravelly SAND: medium to coarse grained, grey, gravels are medium to coarse, angular to sub-angular FILL: Silty SAND: fine to medium grained, yellow brown, trace of fine to medium, sub-angular to angular and brick From 0.80m, yellow brown-grey trace of clay *Log continued on next page.*	- M	- -	ASPHALT FILL

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH1M

Location	300 Burns Bay Road, Lane Cove, NSW			**Started**	09 September 2024
Client	Lane Cove Development No. 1 Pty Ltd			**Completed**	09 September 2024
Job No.	E26484.G03			**Logged By**	KP **Date** 09 September 2024
Sheets	2 of 3			**Review By**	JB **Date** 11 October 2024
Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.25 m (AHD)	**Northing**	6256177.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328958.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	DISCONTINUITIES & ADDITIONAL DATA
				0		*Log continued from previous page.*		
NMLC	80%	79	64	1.80	20.45	SANDSTONE: fine to medium grained, grey-white / brown-red	SW	
				2		NO CORE: 300mm thick	-	
	0%			2.10	20.15	SANDSTONE: fine to medium grained, grey-white / brown-red, laminated		2.20: BP 30° RO CN 2.28: BP 30° PR RO CN 2.31: BP 30° PR RO CN 2.52: BP 15° PR RO SN
		100	97	3.10	19.15	From 3.10m, laminated	SW	
				4.18	18.07	From 4.18m, pale grey, medium to thickly bedded		4.13-4.18: XWS Clay
		100	97				FR	
		100	97	9.20	13.05	From 9.20m, interbedded with shale, dark grey		
				9.65	12.60	From 9.65m, medium bedded		

GRAPHIC LOG

ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral: VL 0-1, L 0-3, M 1, H 3, VH 10, EH

FRACTURE SPACING: 30, 100, 300, 1000, 3000

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH1M

Location	300 Burns Bay Road, Lane Cove, NSW			**Started**	09 September 2024
Client	Lane Cove Development No. 1 Pty Ltd			**Completed**	09 September 2024
Job No.	E26484.G03			**Logged By**	KP **Date** 09 September 2024
Sheets	3 of 3			**Review By**	JB **Date** 11 October 2024
Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.25 m (AHD)	**Northing**	6256177.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328958.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
	0%						From 9.65m, medium bedded				
						12.05	Terminated at 10.20m. Target Depth Reached.				

Depth scale: 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

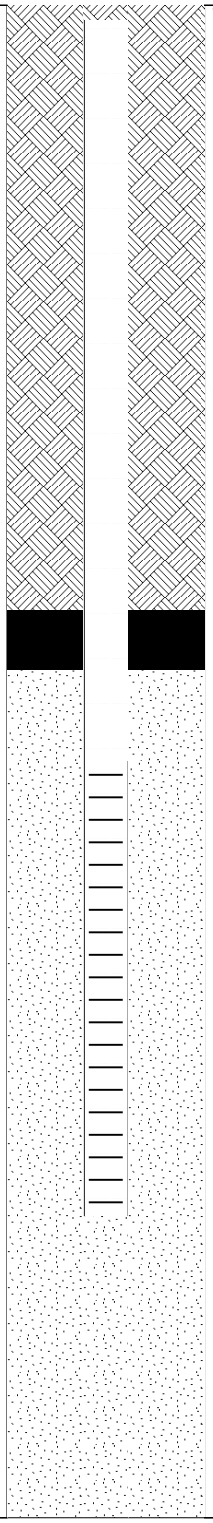
BH ID: BH1M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	09 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	09 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	09 September 2024
Sheets	1 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.25 m (AHD)	**Northing**	6256177.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328958.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
		0.00	22.25	ASPHALT: 100mm thick	-
GWNE	BH1M_0.50-0.95 SPT 0.50-0.95 4,4,2 N=6	0.10	22.15	FILL: Gravelly SAND: medium to coarse grained, grey, gravels are medium to coarse, angular to sub-angular	M
		0.40	21.85	FILL: Silty SAND: fine to medium grained, yellow brown, trace of fine to medium, sub-angular to angular and brick	
		0.80	21.45	From 0.80m, yellow brown-grey trace of clay	
	BH1M_1.50-1.88 SPT 1.50-1.70 1,3/50 mm HB N=R	1.70	20.55	SANDSTONE: fine to medium grained, grey-white / brown-red	
80%		1.80	20.45	NO CORE: 300mm thick	
0%		2.10	20.15	SANDSTONE: fine to medium grained, grey-white / brown-red, laminated	
		3.10	19.15	From 3.10m, laminated	
		4.18	18.07	From 4.18m, pale grey, medium to thickly bedded	
		9.20	13.05	From 9.20m, interbedded with shale, dark grey	
		9.65	12.60	From 9.65m, medium bedded	

BACKFILL DETAILS



STANDPIPE DETAILS

Well Stickup =-0.10m
(RL 22.15m)

0.10m - 5.0m
PVC casing (50mm Ø)

5.0m - 8.0m
PVC screen (50mm Ø)

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

BH ID: BH1M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	09 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	09 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 09 September 2024
Sheets	2 of 2		**Review By**	JB	**Date** 11 October 2024
Drilling Contractor	Geosense Drilling and Engineering	**Surface RL** ≈22.25 m (AHD)	**Northing**	6256177.0000 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	328958.0000 (MGA 2020 Zone 56)	

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
0%				12.05	From 9.65m, medium bedded Terminated at 10.20m. Target Depth Reached.			

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE LOG

BH ID: BH2M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	11 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	11 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	11 September 2024
Sheets	1 of 3	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling andnEngineering	**Surface RL**	≈22.60 m (AHD)	**Northing**	6256200.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328946.0000 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
				0						
AD/T		BH2M_0.50-0.95 SPT 0.50-0.95 10,8,11 N=19		0.00		22.60	ASPHALT: 100mm thick	-	-	ASPHALT
				0.10		22.50	FILL: Gravelly SAND: fine to medium grained, dark grey, gravels are fine to medium, angular to sub-angular	M	-	FILL
				0.30		22.30	FILL: Silty SAND: fine to medium grained, dark brown / grey, with medium to coarse, sub-angular to sub-rounded gravels and sandstone cobbles			
				0.80		21.80	From 0.80m, medium to coarse grained, brown / pale grey-dark grey, trace of sandstone fragments	W		
				1		21.60				
				1.00			SANDSTONE: fine to medium grained, grey-white, distinctly weathered, low strength	-	-	WEATHERED ROCK
				1.20		21.40				
				2						
				3						
				4						
				5						
				6						
				7						
				8						
				9						
				10						

Log continued on next page.

BOREHOLE CORE LOG

BH ID: BH2M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	11 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	11 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 11 September 2024
Sheets	2 of 3		**Review By**	JB	**Date** 11 October 2024
Drilling Contractor	Geosense Drilling andnEngineering	**Surface RL** ≈22.60 m (AHD)	**Northing**	6256200.0000 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	328946.0000 (MGA 2020 Zone 56)	

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	DISCONTINUITIES & ADDITIONAL DATA
				0		*Log continued from previous page.*		
				1				
NMLC	90%	90	76	2		SANDSTONE: fine to medium grained, pale grey, thinly to medium bedded	SW	
	0%			2.30	20.30	From 2.30m, purple red		2.42: JT 30° IR RO OP
				2.45	20.15	NO CORE: 260mm thick	-	
				2.71	19.89	SANDSTONE: fine to medium grained, grey / orange brown, medium bedded	SW	2.75: JT 15° PR RO CN
	90%			3.45	19.15	From 3.45m, pale grey		3.46: BP 30° PR RO CN 3.54: JT 85° PR RO CN 3.61: BP 0° PR RO Clay VN
				4				
		100	100	4.20	18.40	From 4.20m, very thickly bedded		
				5				
				6				
							FR	
	50%			7				
				7.20	15.40	From 7.20m, medium to thickly bedded		
				8				8.05: JT 5° PR RO CN
		100	99					
				9				
				10				

ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral: VL 0-1, L 0-3, M 1, H 3, VH 10, EH

FRACTURE SPACING: 30, 100, 300, 1000, 3000

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH2M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	11 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	11 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 11 September 2024
Sheets	3 of 3		**Review By**	JB	**Date** 11 October 2024

Drilling Contractor	Geosense Drilling andnEngineering	**Surface RL**	≈22.60 m (AHD)	**Northing**	6256200.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328946.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
						12.52	From 7.20m, medium to thickly bedded Terminated at 10.08m. Target Depth Reached.				
				11							
				12							
				13							
				14							
				15							
				16							
				17							
				18							
				19							
				20							

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

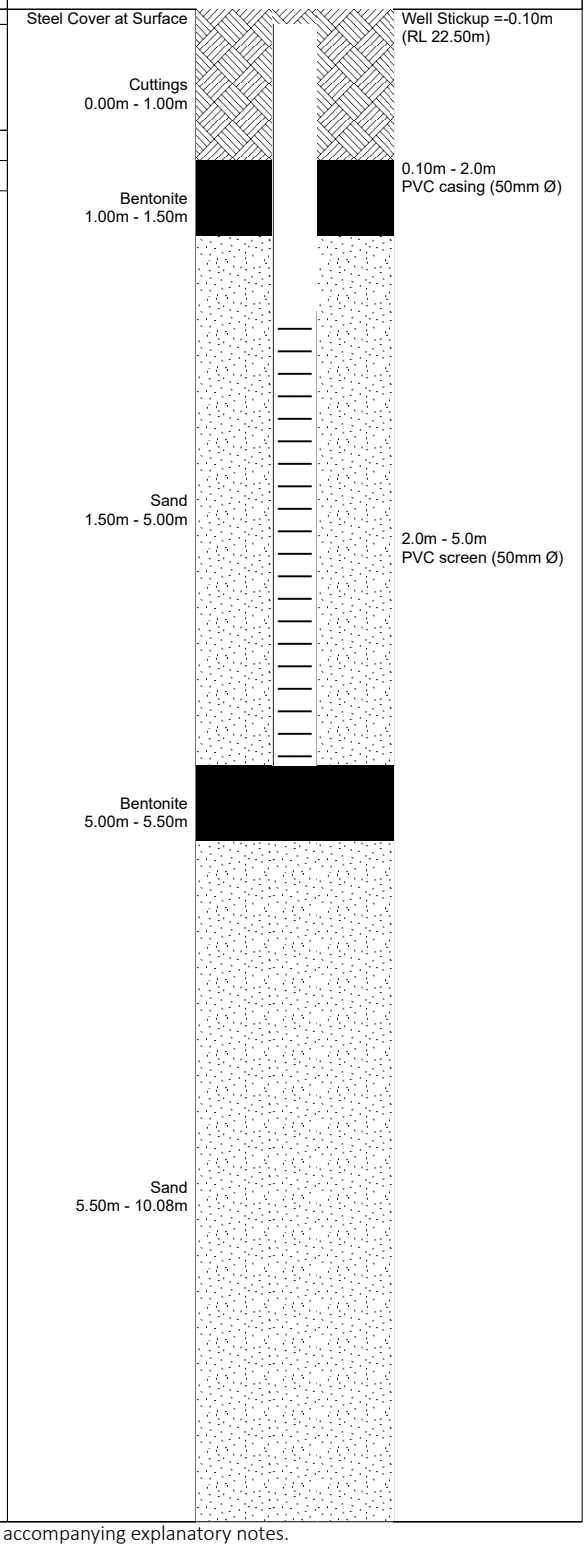
MONITORING WELL LOG

BH ID: BH2M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	11 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	11 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	11 September 2024
Sheets	1 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling andnEngineering	**Surface RL**	≈22.60 m (AHD)	**Northing**	6256200.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328946.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
		0.00	22.60	ASPHALT: 100mm thick	-
		0.10	22.50	FILL: Gravelly SAND: fine to medium grained, dark grey, gravels are fine to medium, angular to sub-angular	M
	BH2M_0.50-0.95 SPT 0.50-0.95 10,8,11 N=19	0.30	22.30	FILL: Silty SAND: fine to medium grained, dark brown / grey, with medium to coarse, sub-angular to sub-rounded gravels and sandstone cobbles	
		0.80	21.80	From 0.80m, medium to coarse grained, brown / pale grey-dark grey, trace of sandstone fragments	W
		1.00	21.60	SANDSTONE: fine to medium grained, grey-white, distinctly weathered, low strength	-
90%		1.20	21.40	SANDSTONE: fine to medium grained, pale grey, thinly to medium bedded	
		2			
0%		2.30	20.30	From 2.30m, purple red	
		2.45	20.15	NO CORE: 260mm thick	
		2.71	19.89	SANDSTONE: fine to medium grained, grey / orange brown, medium bedded	
		3			
90%		3.45	19.15	From 3.45m, pale grey	
		4			
		4.20	18.40	From 4.20m, very thickly bedded	
		5			
		6			
50%		7			
		7.20	15.40	From 7.20m, medium to thickly bedded	
		8			
		9			
		10			



This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

BH ID: BH2M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	11 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	11 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	11 September 2024
Sheets	2 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling andnEngineering	**Surface RL**	≈22.60 m (AHD)	**Northing**	6256200.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	328946.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
				12.52	From 7.20m, medium to thickly bedded Terminated at 10.08m. Target Depth Reached.			
		11						
		12						
		13						
		14						
		15						
		16						
		17						
		18						
		19						
		20						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE LOG

BH ID: BH3M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	09 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	09 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 09 September 2024
Sheets	1 of 3		**Review By**	JB	**Date** 11 October 2024
Drilling Contractor	Geosense Drilling and Engineering	**Surface RL** ≈22.30 m (AHD)	**Northing**	6256195.0000 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	329007.0000 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
				0.00		22.30	ASPHALT: 100mm thick	-	-	ASPHALT
AD/T	GWNE			0.10		22.20	FILL: Gravelly SAND: fine to medium grained, dark grey / pale grey, gravels are fine to medium, angular to sub-angular, trace of clay	M	-	FILL
		BH3M_0.50-0.60 SPT 0.50-0.60 7/100 mm HB N=R		0.50 0.60		21.80 21.70	SANDSTONE: fine to medium grained, grey-white, distinctly weathered, low strength	-	-	WEATHERED ROCK

Log continued on next page.

BOREHOLE CORE LOG

BH ID: BH3M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	09 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	09 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 09 September 2024
Sheets	2 of 3		**Review By**	JB	**Date** 11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.30 m (AHD)	**Northing**	6256195.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329007.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	DISCONTINUITIES & ADDITIONAL DATA
				0		*Log continued from previous page.*		
NMLC	60%	94	73	1		SANDSTONE: fine to medium grained, pale grey / brown, very thinly to thinly bedded	DW	1.12: JT 85° PR RO Fe SN 1.22: JT 80° PR RO Fe SN
				1.38	20.92	NO CORE: 180mm thick	-	
				1.56	20.74	SANDSTONE: fine to medium grained, brown / grey, very thinly bedded	DW	1.63-1.64: XWS Clay 1.65: JT 90° PR RO CN 1.70-1.73: CS 1.78-1.81: XWS Clay
				1.81	20.49	From 1.81m, thinly to medium bedded		2.20: JT 5° PR RO CN 2.51: JT 90° PR RO CN 2.59: JT PR RO Clay VN 2.74-2.77: XWS
				2.77	19.53	From 2.77m, medium to thickly bedded		
	70%	100	96	4			FR	
				5				
				6				
	80%	100	90	7				6.73: JT 25° PR RO CN 6.80: JT 10° PR RO CN 7.11: JT 10° PR RO CN 7.68: JT 75° UN RO Fe SN 7.71: JT 5° PR RO CN 7.73: JT 45° PR RO CN 7.88-7.90: XWS
				7.89	14.41	From 7.89m, interbedded with shale, dark grey		
				8				
				8.68	13.62	From 8.68m, grey / grey-white		8.67-8.68: XWS
				9				8.98-9.00: XWS 9.64: JT 75° UN RO Fe SN 9.66: JT 75° UN RO Fe SN
				10				

ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral: VL 0-1, L 0-3, M 1, H 3, VH 10, EH

FRACTURE SPACING: 30, 100, 300, 1000, 3000

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH3M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	09 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	09 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 09 September 2024
Sheets	3 of 3		**Review By**	JB	**Date** 11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.30 m (AHD)	**Northing**	6256195.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329007.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
	80%	100	99	11, 12			From 8.68m, grey / grey-white		M–H	11.46-11.48: XWS 11.88: JT 15° PR RO CN 11.96: JT 25° PR RO CN	100–300
		100	53	12.80, 13, 14, 15		9.50	From 12.80m, thinly to medium bedded	DW - SW	M–H	12.86: JT 5° PR RO CN 13.20: JT 15° PR RO CN 13.22: JT 15° PR RO CN 13.24: JT 15° IR RO CN 14.03: JT 30° PR RO Clay VN 14.30: JT 85° PR RO OP 14.37: JT 15° PR RO CN 14.42: JT 45° IR RO OP 14.80-14.92: CZ	100–300
				16, 17, 18, 19, 20		7.18	Terminated at 15.12m. Target Depth Reached.				

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

BH ID: BH3M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	09 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	09 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	09 September 2024
Sheets	1 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.30 m (AHD)	**Northing**	6256195.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329007.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
		0.00	22.30	ASPHALT: 100mm thick	-
GWNE		0.10	22.20	FILL: Gravelly SAND: fine to medium grained, dark grey / pale grey, gravels are fine to medium, angular to sub-angular, trace of clay	M
	BH3M_0.50-0.60 SPT 0.50-0.60 7/100 mm HB N=R	0.50	21.80	SANDSTONE: fine to medium grained, grey-white, distinctly weathered, low strength	-
		0.60	21.70	SANDSTONE: fine to medium grained, pale grey / brown, very thinly to thinly bedded	
60%		1.38	20.92	NO CORE: 180mm thick	
		1.56	20.74	SANDSTONE: fine to medium grained, brown / grey, very thinly bedded	
		1.81	20.49	From 1.81m, thinly to medium bedded	
		2.77	19.53	From 2.77m, medium to thickly bedded	
70%					
		7.89	14.41	From 7.89m, interbedded with shale, dark grey	
80%		8.68	13.62	From 8.68m, grey / grey-white	

BACKFILL DETAILS

- Steel Cover at Surface
- Cuttings 0.00m - 3.80m
- Bentonite 3.80m - 4.30m
- Sand 4.30m - 8.00m
- Bentonite 8.00m - 9.50m

STANDPIPE DETAILS

- Well Stickup =-0.10m (RL 22.20m)
- 0.10m - 5.0m PVC casing (50mm Ø)
- 5.0m - 8.0m PVC screen (50mm Ø)

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

BH ID: BH3M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	09 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	09 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	09 September 2024
Sheets	2 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.30 m (AHD)	**Northing**	6256195.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329007.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
80%		11, 12, 12.80, 13, 14, 15		9.50	From 8.68m, grey / grey-white From 12.80m, thinly to medium bedded		Sand 9.50m - 15.12m	
		16, 17, 18, 19, 20		7.18	Terminated at 15.12m. Target Depth Reached.			

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE LOG

BH ID: BH4

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	10 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	10 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	10 September 2024
Sheets	1 of 3	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.20 m (AHD)	**Northing**	6256173.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329011.0000 (MGA 2020 Zone 56)

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T	GWNE			0.00		22.20	ASPHALT: 150mm thick	-	-	ASPHALT
				0.15		22.05	FILL: Gravelly SAND: fine to medium grained, dark brown, gravels are fine to medium, angular to sub-angular	M	-	FILL
		BH5_0.50-0.95 SPT 0.50-0.95 5,3,2 N=5		0.50		21.70	FILL: Silty SAND: fine to medium grained, brown, trace of fine to medium, angular to sub-angular			FILL
				1.20		21.00	Silty CLAY: low plasticity, brown	M < PL	-	RESIDUAL SOIL
		BH5_1.50-1.80 SPT 1.50-1.70 0,4/50 mm HB N=R		1.50		20.70	From 1.50m, low plasticity, grey / orange brown, grading into extremely weathered sandstone			
				1.84		20.36	*Log continued on next page.*			

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH4

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	10 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	10 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 10 September 2024
Sheets	2 of 3		**Review By**	JB	**Date** 11 October 2024

Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.20 m (AHD)	**Northing**	6256173.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329011.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
				0		*Log continued from previous page.*				
				1						
NMLC	80%	100	94	2		SANDSTONE: fine to medium grained, grey / dark brown, thickly bedded	SW		3.84: JT 25° PR RO CN 3.88-3.95: XWS 3.88: JT 25° PR RO CN	
				3						
				4						
		98	91	4.48	17.72	SANDSTONE: pale grey, thickly bedded	FR		4.50: JT 15° PR RO CN	
				5						
				6						
				6.51	15.69	NO CORE: 60mm thick	-		6.48-6.51: XWS	
				6.57	15.63	SANDSTONE: fine to medium grained, pale grey, interbedded with shale, dark shale, thinly to medium bedded			6.57-6.61: XWS	
				7						
		100	93	8			FR			
				8.68	13.52	From 8.68m, grey-brown, medium bedded			8.71-8.74: XWS	
				9						
				9.45	12.75	From 9.45m, grey, interbedded with shale, dark grey			9.49: JT 5° CU RO CN	
				10						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH4

Location	300 Burns Bay Road, Lane Cove, NSW			**Started**	10 September 2024
Client	Lane Cove Development No. 1 Pty Ltd			**Completed**	10 September 2024
Job No.	E26484.G03			**Logged By**	KP **Date** 10 September 2024
Sheets	3 of 3			**Review By**	JB **Date** 11 October 2024
Drilling Contractor	Geosense Drilling and Engineering	**Surface RL**	≈22.20 m (AHD)	**Northing**	6256173.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329011.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral (VL 0-1, L 0-3, M 1, H 3, VH 10, EH)	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING (30, 100, 300, 1000, 3000)
	80%						From 9.45m, grey, interbedded with shale, dark grey			10.20-10.22: XWS ~~10.22: JT 15° PR RO CN~~ 10.31-10.32: XWS	
						11.88	Terminated at 10.32m. Target Depth Reached.				
				11							
				12							
				13							
				14							
				15							
				16							
				17							
				18							
				19							
				20							

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE LOG

BH ID: BH5M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	10 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	10 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 10 September 2024
Sheets	1 of 3		**Review By**	JB	**Date** 11 October 2024
Drilling Contractor	Geosense drilling and engineering	**Surface RL** ≈22.15 m (AHD)	**Northing**	6256169.0000 (MGA 2020 Zone 56)	
Plant	Comacchio Geo 205	**Inclination** 90°	**Easting**	329038.0000 (MGA 2020 Zone 56)	

METHOD	GROUND WATER LEVELS	SAMPLES & FIELD TESTS	SAMPLE RECOVERY	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY / REL. DENSITY	MATERIAL ORIGIN & OBSERVATIONS
AD/T				0.00		22.15	ASPHALT: 100mm thick	-	-	ASPHALT
				0.10		22.05	FILL: Gravelly SAND: fine to medium grained, dark grey, gravels are fine to coarse, angular to sub-angular	M	-	FILL
		BH5M_0.60-1.05 SPT 0.60-1.05 4,2,3 N=5		0.60		21.55	FILL: Clayey SAND: medium to coarse grained, dark grey / grey-white, trace of clay and weathered sandstone and with fine to medium, angular to sub-angular gravel			
		BH5M_1.50-1.95 SPT 1.50-1.95 3,0,0 N=0		1						
				2				W		
				2.30		19.85	SANDSTONE: medium to coarse grained, grey- white / yellow brown, extremely weathered sandstone, very low to low strength	-	-	RESIDUAL SOIL
				2.50		19.65	*Log continued on next page.*			
				3						
				4						
				5						
				6						
				7						
				8						
				9						
				10						

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH5M

Location	300 Burns Bay Road, Lane Cove, NSW		**Started**	10 September 2024	
Client	Lane Cove Development No. 1 Pty Ltd		**Completed**	10 September 2024	
Job No.	E26484.G03		**Logged By**	KP	**Date** 10 September 2024
Sheets	2 of 3		**Review By**	JB	**Date** 11 October 2024

Drilling Contractor	Geosense drilling and engineering	**Surface RL**	≈22.15 m (AHD)	**Northing**	6256169.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329038.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	DISCONTINUITIES & ADDITIONAL DATA
				0		*Log continued from previous page.*		
NMLC	70%	100	88	2.52		SANDSTONE: fine to medium grained, grey / brown, medium to thickly bedded	SW	2.52: JT 90° PR RO CN 4.12: JT 30° PR RO Fe SN 4.51-4.54: XWS 5.55-5.54: XWS
NMLC	80%	96	84	5.60	16.55	From 5.60m, thinly to medium bedded	SW	5.72: JT 75° CU RO OP 6.52: JT 15° PR RO CN 6.73-6.76: XWS 7.45-7.46: XWS 8.24-8.31: XWS
				6.53	15.62	NO CORE: 120mm thick	-	
				6.65	15.50	SANDSTONE: fine to medium grained, grey / brown / purple red, medium to thickly bedded		
NMLC	80%	100	98	9.05			SW	9.05-9.07: XWS

ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral: VL 0-1, L 0-3, M 1, H 3, VH 10, EH

FRACTURE SPACING: 30, 100, 300, 1000, 3000

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

BOREHOLE CORE LOG

BH ID: BH5M

Location	300 Burns Bay Road, Lane Cove, NSW			**Started**	10 September 2024
Client	Lane Cove Development No. 1 Pty Ltd			**Completed**	10 September 2024
Job No.	E26484.G03			**Logged By**	KP **Date** 10 September 2024
Sheets	3 of 3			**Review By**	JB **Date** 11 October 2024
Drilling Contractor	Geosense drilling and engineering	**Surface RL**	≈22.15 m (AHD)	**Northing**	6256169.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329038.0000 (MGA 2020 Zone 56)

METHOD	Flush Return	TCR %	RQD %	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	WEATHERING	ESTIMATED STRENGTH Is(50) ▼ - Axial ▽ - Diametral	DISCONTINUITIES & ADDITIONAL DATA	FRACTURE SPACING
	80 %					12.02	SANDSTONE: fine to medium grained, grey / brown / purple red, medium to thickly bedded Terminated at 10.13m. Target Depth Reached.				

DEPTH (m): 11, 12, 13, 14, 15, 16, 17, 18, 19, 20

ESTIMATED STRENGTH: VL 0-1, L 0-3, M 1, H 3, VH 10, EH

FRACTURE SPACING: 30, 100, 300, 1000, 3000

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

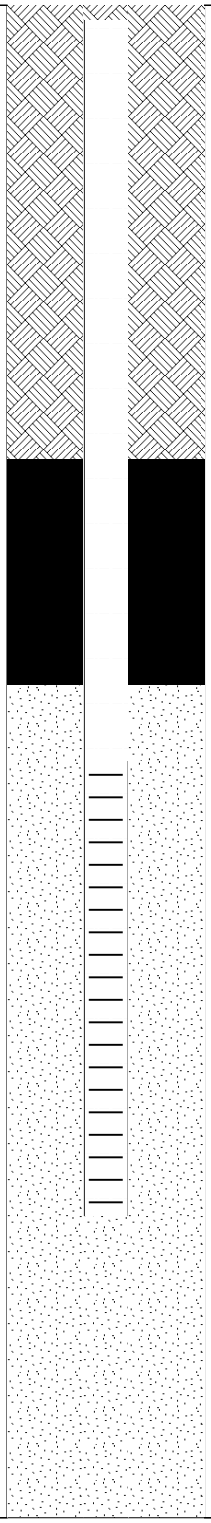
BH ID: BH5M

Location	300 Burns Bay Road, Lane Cove, NSW	**Started**	10 September 2024		
Client	Lane Cove Development No. 1 Pty Ltd	**Completed**	10 September 2024		
Job No.	E26484.G03	**Logged By**	KP	**Date**	10 September 2024
Sheets	1 of 2	**Review By**	JB	**Date**	11 October 2024

Drilling Contractor	Geosense drilling and engineering	**Surface RL**	≈22.15 m (AHD)	**Northing**	6256169.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329038.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION
		0.00	22.15	ASPHALT: 100mm thick	-
		0.10	22.05	FILL: Gravelly SAND: fine to medium grained, dark grey, gravels are fine to coarse, angular to sub-angular	
	BH5M_0.60-1.05 SPT 0.60-1.05 4,2,3 N=5	0.60	21.55	FILL: Clayey SAND: medium to coarse grained, dark grey / grey-white, trace of clay and weathered sandstone and with fine to medium, angular to sub-angular gravel	M
▷	BH5M_1.50-1.95 SPT 1.50-1.95 3,0,0 N=0				W
		2.30	19.85	SANDSTONE: medium to coarse grained, grey-white / yellow brown, extremely weathered sandstone, very low to low strength	-
		2.50	19.65	SANDSTONE: fine to medium grained, grey / brown, medium to thickly bedded	
70%					
		5.60	16.55	From 5.60m, thinly to medium bedded	
		6.53	15.62	NO CORE: 120mm thick	
		6.65	15.50	SANDSTONE: fine to medium grained, grey / brown / purple red, medium to thickly bedded	
80%					

BACKFILL DETAILS	STANDPIPE DETAILS
Steel Cover at Surface	Well Stickup =-0.10m (RL 22.05m)
Cuttings 0.00m - 3.00m	
	0.10m - 5.0m PVC casing (50mm Ø)
Bentonite 3.00m - 4.50m	
	5.0m - 8.0m PVC screen (50mm Ø)
Sand 4.50m - 10.13m	



This log should be read in conjunction with EI Australia's accompanying explanatory notes.

MONITORING WELL LOG

BH ID: BH5M

Location	300 Burns Bay Road, Lane Cove, NSW			**Started**	10 September 2024
Client	Lane Cove Development No. 1 Pty Ltd			**Completed**	10 September 2024
Job No.	E26484.G03			**Logged By**	KP **Date** 10 September 2024
Sheets	2 of 2			**Review By**	JB **Date** 11 October 2024
Drilling Contractor	Geosense drilling and engineering	**Surface RL**	≈22.15 m (AHD)	**Northing**	6256169.0000 (MGA 2020 Zone 56)
Plant	Comacchio Geo 205	**Inclination**	90°	**Easting**	329038.0000 (MGA 2020 Zone 56)

WATER	SAMPLES & FIELD TESTS	DEPTH (m)	GRAPHIC LOG	RL (m AHD)	MATERIAL DESCRIPTION	MOISTURE CONDITION	BACKFILL DETAILS	STANDPIPE DETAILS
80 %				12.02	SANDSTONE: fine to medium grained, grey / brown / purple red, medium to thickly bedded Terminated at 10.13m. Target Depth Reached.			

This log should be read in conjunction with EI Australia's accompanying explanatory notes.

Appendix G – Laboratory Documentation

Sheet 1 of 1

Site: 300 Burns Bay Road, Lane Cove

Project No: E26484

Laboratory: **SGS Australia**
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	SOIL	WATER	0.45 µm field filtered	OTHER	pH / EC (electrical conductivity)	Alkalinity (bicarbonate, hydroxide and total	Major Anions	Major Cations	Ionic balance	Nutrients	Feacal coliforms	Faecal Streptococci	Escheriachia Coli	Redox / TDS / Hardness / Temperature	HM / DO	Physical Parameters	BTEX / TRHs	PFAS	OCPs / OPPs / PCBs	SVOCs	VOCs / PAHS	Al, As, Cd, Cr, Cu, Pb, Hg, Ni & Zn	Total Phenols	Cyanide	BTEX	Cyanide, Turbidity TDS, Hardness
BH1M	1	S,P, VC	18/09/2024	am/pm		X	X		X												X				X	X	X			X
BH2M	2	S,P, VC	18/09/2024	am/pm		X	X		X												X				X	X	X			X
BH5M	3	S,P, VC	18/09/2024	am/pm		X	X		X												X				X	X	X			X
BH3M	4	S,P, VC	18/09/2024	am/pm		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		
GQD1	5	S,P, VC	18/09/2024	am/pm		X	X														X					X				
GQRB1	6	S,P, VC	18/09/2024	am/pm		X															X					X				
GQFB1		S,P, VC	18/09/2024	am/pm		X																								
GQTS1	7	VC	Lab Prepared			X																							X	
GQTB1	8	VC	Lab Prepared			X																							X	

Comments

Major Anions
Sulfate (SO_4)
Chloride (Cl)
Carbonates (CO_4)
Bromide (Br)
Fluoride (F)
Major Cations
Calcium (Ca)
Magnesium (Mg)
Sodium (Na)
Potassium (K)
Ionic balance
Cation/anion balance (as percentage)
Nutrients
Ammonia (NH_3)
Nitrate
Total Nitrogen
Oxidised Ntrogen
Total Phosphorus
Reactive Phosphorus
HM
Metals (Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, dissolved SiO^2, Ag, Sr, U, V, Zn)
Physical Parameters
Turbidity, Total suspendd Solids, Total Organic Carbon, Sodium absorption Ratio

LABORATORY TURNAROUND

- [x] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass botlle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [ ]

Sampler's Name (EI):	Received by (SGS):
Print: Linda Sweeney	Print:
Signature: L Sweeney	Signature:
Date: 18/09/2024	Date: 18.9.24 2pm

Sampler's Comments:
Please fwd GW-QT1 to Envirolab with ice
cc: Andrew.Schmidt

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC June 2021 FORM v.5 - SGS

SGS EHS Sydney COC
SE271241

source: SE_Autoscan.pdf page: 1 SGS Ref: SE271241_COC

SAMPLE RECEIPT ADVICE

SE271241

CLIENT DETAILS

Contact	Linda Sweeney
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 9516 0722
Facsimile	(Not specified)
Email	linda.sweeney@eiaustralia.com.au
Project	**E26484, 300 Burns Bay Rd, Lane Cove**
Order Number	**E26484**
Samples	8

LABORATORY DETAILS

Manager	Shane McDermott
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Wed 18/9/2024
Report Due	Wed 25/9/2024
SGS Reference	**SE271241**

SUBMISSION DETAILS

This is to confirm that 8 samples were received on Wednesday 18/9/2024. Results are expected to be ready by COB Wednesday 25/9/2024.
Please quote SGS reference SE271241 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Type of documentation received	COC	Date documentation received	18/09/2024
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.9°C	Sample container provider	SGS
Turnaround time requested	Standard	Samples received in correct containers	Yes
Sufficient sample for analysis	Yes	Sample cooling method	Ice Bricks
Samples clearly labelled	Yes	Complete documentation received	Yes
Sample counts by matrix	8 Water		

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

1 sample has been placed on hold as no tests have been assigned for it. This sample will not be processed.
GQT1 forwarded to Envirolab.

This document is issued by the Company under its General Conditions of Service accessible at www.sgs.com/en/Terms-and-Conditions.aspx.
Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

SAMPLE RECEIPT ADVICE

SE271241

CLIENT DETAILS

Client EI AUSTRALIA

Project E26484, 300 Burns Bay Rd, Lane Cove

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity and TDS by Calculation - Water	PAH (Polynuclear Aromatic Hydrocarbons) in Water	pH in water	Total Dissolved Solids (TDS) in water	Total Phenolics in Water	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	BH1M	1	23	1	1	1	10	77	13
002	BH2M	1	23	1	1	1	10	77	13
003	BH5M	1	23	1	1	1	10	77	13
004	BH3M	1	23	1	1	1	10	77	13
005	GQD1	-	-	-	-	-	10	11	13
006	GQRB1	-	-	-	-	-	10	11	13
007	GQTS1	-	-	-	-	-	-	11	-
008	GQTB1	-	-	-	-	-	-	11	-

CONTINUED OVERLEAF

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

SAMPLE RECEIPT ADVICE

SE271241

CLIENT DETAILS

Client EI AUSTRALIA

Project E26484, 300 Burns Bay Rd, Lane Cove

SUMMARY OF ANALYSIS

No.	Sample ID	Alkalinity	Anions by Ion Chromatography in Water	Mercury (dissolved) in Water	Metals in Water (Dissolved) by ICPOES	Total Cyanide in water by Discrete Analyser	Trace Metals (Dissolved) in Water by ICPMS	Turbidity
001	BH1M	-	-	1	3	1	8	1
002	BH2M	-	-	1	3	1	8	1
003	BH5M	-	-	1	3	1	8	1
004	BH3M	13	5	1	9	1	21	1
005	GQD1	-	-	1	-	-	8	-
006	GQRB1	-	-	1	-	-	8	-

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE271241

CLIENT DETAILS

Client EI AUSTRALIA

Project E26484, 300 Burns Bay Rd, Lane Cove

SUMMARY OF ANALYSIS

No.	Sample ID	Ammonia Nitrogen by Discrete Analyser	Calculation of Anion-Cation Balance	Dissolved Oxygen by Membrane Electrode	Filterable Reactive Phosphorus (FRP)	Forms of Carbon	Nitrite in Water	Redox Potential (Eh) in water	TKN Kjeldahl Digestion by Discrete Analyser	Total and Volatile Suspended Solids (TSS /	Total Phosphorus by Kjeldahl Digestion DA in
004	BH3M	1	4	3	1	1	2	2	2	1	1

CONTINUED OVERLEAF

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SAMPLE RECEIPT ADVICE

SE271241

CLIENT DETAILS

Client EI AUSTRALIA

Project E26484, 300 Burns Bay Rd, Lane Cove

SUMMARY OF ANALYSIS

No.	Sample ID	E. coli and Thermotolerant coliforms in Water (CFU)	Enterococci in Water	Full 8270 SVOC in Water	OC Pesticides in Water	OP Pesticides in Water	PCBs in Water	Per- and Polyfluoroalkyl Substances (PFAS) in
004	BH3M	3	3	165	30	13	11	60

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
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Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Linda Sweeney
Client	EI AUSTRALIA
Address	SUITE 6.01 55 MILLER STREET PYRMONT NSW 2009
Telephone	61 2 9516 0722
Facsimile	(Not specified)
Email	linda.sweeney@eiaustralia.com.au
Project	**E26484, 300 Burns Bay Rd, Lane Cove**
Order Number	**E26484**
Samples	8

LABORATORY DETAILS

Manager	Shane McDermott
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE271241 R0**
Date Received	18/9/2024
Date Reported	25/9/2024

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

SIGNATORIES

Akheeqar BENIAMEEN
Chemist

Dong LIANG
Metals/Inorganics Team Leader

Kamrul AHSAN
Senior Chemist

Ly Kim HA
Organic Section Head

Teresa NGUYEN
Organic Chemist

Tim MEEYAN
Lab Tech

Ying Ying ZHANG
Laboratory Technician

VOCs in Water [AN433] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
Benzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	**2.4**	<0.5	<0.5	<0.5	**2.7**
Ethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	µg/L	1	<1	<1	<1	<1	<1
o-xylene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylenes	µg/L	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Total BTEX	µg/L	3	<3	<3	<3	<3	<3
Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	<5	<5	-
Chloromethane	µg/L	5	<5	<5	<5	<5	-
Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	<0.3	<0.3	-
Bromomethane	µg/L	10	<10	<10	<10	<10	-
Chloroethane	µg/L	5	<5	<5	<5	<5	-
Trichlorofluoromethane	µg/L	1	<1	<1	<1	<1	-
Acetone (2-propanone)	µg/L	10	<10	<10	<10	<10	-
Iodomethane	µg/L	5	<5	<5	<5	<5	-
1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Acrylonitrile	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	<5	<5	-
Allyl chloride	µg/L	2	<2	<2	<2	<2	-
Carbon disulfide	µg/L	2	<2	<2	<2	<2	-
trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Vinyl acetate*	µg/L	10	<10	<10	<10	<10	-
MEK (2-butanone)	µg/L	10	<10	<10	<10	<10	-
cis-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Bromochloromethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Chloroform (THM)	µg/L	0.5	**27**	**9.3**	**15**	**5.2**	-
2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Dibromomethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
2-nitropropane	µg/L	100	<100	<100	<100	<100	-
Bromodichloromethane (THM)	µg/L	0.5	**1.9**	**0.5**	**1.1**	**0.5**	-
MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	<5	<5	-
cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
2-hexanone (MBK)	µg/L	5	<5	<5	<5	<5	-
1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Chlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Bromoform (THM)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	<1	<1	-
Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-

VOCs in Water [AN433] Tested: 19/9/2024 (continued)

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
Bromobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
n-propylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
2-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
4-chlorotoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
tert-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
sec-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	<0.3	<0.3	-
p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
n-butylbenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	-
Total VOC	µg/L	10	**32**	**10**	**18**	<10	-

VOCs in Water [AN433] Tested: 19/9/2024 (continued)

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006	GQTS1 WATER - 18/9/2024 SE271241.007	GQTB1 WATER - 18/9/2024 SE271241.008
Benzene	µg/L	0.5	<0.5	[98%]	<0.5
Toluene	µg/L	0.5	<0.5	[94%]	<0.5
Ethylbenzene	µg/L	0.5	<0.5	[99%]	<0.5
m/p-xylene	µg/L	1	<1	[100%]	<1
o-xylene	µg/L	0.5	<0.5	[100%]	<0.5
Total Xylenes	µg/L	1.5	<1.5	-	<1.5
Total BTEX	µg/L	3	<3	-	<3
Naphthalene (VOC)*	µg/L	0.5	<0.5	[88%]	<0.5
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-	-
Chloromethane	µg/L	5	-	-	-
Vinyl chloride (Chloroethene)	µg/L	0.3	-	-	-
Bromomethane	µg/L	10	-	-	-
Chloroethane	µg/L	5	-	-	-
Trichlorofluoromethane	µg/L	1	-	-	-
Acetone (2-propanone)	µg/L	10	-	-	-
Iodomethane	µg/L	5	-	-	-
1,1-dichloroethene	µg/L	0.5	-	-	-
Acrylonitrile	µg/L	0.5	-	-	-
Dichloromethane (Methylene chloride)	µg/L	5	-	-	-
Allyl chloride	µg/L	2	-	-	-
Carbon disulfide	µg/L	2	-	-	-
trans-1,2-dichloroethene	µg/L	0.5	-	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-	-	-
1,1-dichloroethane	µg/L	0.5	-	-	-
Vinyl acetate*	µg/L	10	-	-	-
MEK (2-butanone)	µg/L	10	-	-	-
cis-1,2-dichloroethene	µg/L	0.5	-	-	-
Bromochloromethane	µg/L	0.5	-	-	-
Chloroform (THM)	µg/L	0.5	-	-	-
2,2-dichloropropane	µg/L	0.5	-	-	-
1,2-dichloroethane	µg/L	0.5	-	-	-
1,1,1-trichloroethane	µg/L	0.5	-	-	-
1,1-dichloropropene	µg/L	0.5	-	-	-
Carbon tetrachloride	µg/L	0.5	-	-	-
Dibromomethane	µg/L	0.5	-	-	-
1,2-dichloropropane	µg/L	0.5	-	-	-
Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	-	-	-
2-nitropropane	µg/L	100	-	-	-
Bromodichloromethane (THM)	µg/L	0.5	-	-	-
MIBK (4-methyl-2-pentanone)	µg/L	5	-	-	-
cis-1,3-dichloropropene	µg/L	0.5	-	-	-
trans-1,3-dichloropropene	µg/L	0.5	-	-	-
1,1,2-trichloroethane	µg/L	0.5	-	-	-
1,3-dichloropropane	µg/L	0.5	-	-	-
Dibromochloromethane (THM)	µg/L	0.5	-	-	-
2-hexanone (MBK)	µg/L	5	-	-	-
1,2-dibromoethane (EDB)	µg/L	0.5	-	-	-
Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	-	-	-
1,1,1,2-tetrachloroethane	µg/L	0.5	-	-	-
Chlorobenzene	µg/L	0.5	-	-	-
Bromoform (THM)	µg/L	0.5	-	-	-
Styrene (Vinyl benzene)	µg/L	0.5	-	-	-
1,1,2,2-tetrachloroethane	µg/L	0.5	-	-	-
1,2,3-trichloropropane	µg/L	0.5	-	-	-
trans-1,4-dichloro-2-butene	µg/L	1	-	-	-
Isopropylbenzene (Cumene)	µg/L	0.5	-	-	-

VOCs in Water [AN433] Tested: 19/9/2024 (continued)

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006	GQTS1 WATER - 18/9/2024 SE271241.007	GQTB1 WATER - 18/9/2024 SE271241.008
Bromobenzene	µg/L	0.5	-	-	-
n-propylbenzene	µg/L	0.5	-	-	-
2-chlorotoluene	µg/L	0.5	-	-	-
4-chlorotoluene	µg/L	0.5	-	-	-
1,3,5-trimethylbenzene	µg/L	0.5	-	-	-
tert-butylbenzene	µg/L	0.5	-	-	-
1,2,4-trimethylbenzene	µg/L	0.5	-	-	-
sec-butylbenzene	µg/L	0.5	-	-	-
1,3-dichlorobenzene	µg/L	0.5	-	-	-
1,4-dichlorobenzene	µg/L	0.3	-	-	-
p-isopropyltoluene	µg/L	0.5	-	-	-
1,2-dichlorobenzene	µg/L	0.5	-	-	-
n-butylbenzene	µg/L	0.5	-	-	-
1,2-dibromo-3-chloropropane	µg/L	0.5	-	-	-
1,2,4-trichlorobenzene	µg/L	0.5	-	-	-
Hexachlorobutadiene	µg/L	0.5	-	-	-
1,2,3-trichlorobenzene	µg/L	0.5	-	-	-
Total VOC	µg/L	10	-	-	-

Volatile Petroleum Hydrocarbons in Water [AN433] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
TRH C6-C9	µg/L	40	<40	<40	<40	<40	<40
Benzene (F0)	µg/L	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TRH C6-C10	µg/L	50	<50	<50	<50	<50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	<50	<50	<50
DIPE (Di isopropyl Ether)*	µg/L	2	-	-	-	-	-
ETBE (Ethyl Tertiary tert Butyl Ether)*	µg/L	2	-	-	-	-	-
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-	-	-	-	-
TAME (Tertiary tert Amyl Methyl Ether)*	µg/L	2	-	-	-	-	-
TBA (Tertiary tert Butyl Alcohol)*	µg/L	2	-	-	-	-	-
Styrene	µg/L	0.5	-	-	-	-	-

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006
TRH C6-C9	µg/L	40	<40
Benzene (F0)	µg/L	0.5	<0.5
TRH C6-C10	µg/L	50	<50
TRH C6-C10 minus BTEX (F1)	µg/L	50	<50
DIPE (Di isopropyl Ether)*	µg/L	2	-
ETBE (Ethyl Tertiary tert Butyl Ether)*	µg/L	2	-
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-
TAME (Tertiary tert Amyl Methyl Ether)*	µg/L	2	-
TBA (Tertiary tert Butyl Alcohol)*	µg/L	2	-
Styrene	µg/L	0.5	-

TRH (Total Recoverable Hydrocarbons) in Water [AN403] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
TRH C10-C14	µg/L	50	<50	<50	<50	<50	<50
TRH C15-C28	µg/L	200	<200	<200	<200	<200	<200
TRH C29-C36	µg/L	200	<200	<200	<200	**330**	<200
TRH C37-C40	µg/L	200	<200	<200	<200	<200	<200
TRH >C10-C16	µg/L	60	<60	<60	<60	<60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	<60	<60	<60
TRH >C16-C34 (F3)	µg/L	500	<500	<500	<500	<500	<500
TRH >C34-C40 (F4)	µg/L	500	<500	<500	<500	<500	<500
TRH C10-C40	µg/L	320	<320	<320	<320	**650**	<320
TRH C7-C9	µg/L	40	-	-	-	-	-

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006
TRH C10-C14	µg/L	50	<50
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
TRH C37-C40	µg/L	200	<200
TRH >C10-C16	µg/L	60	<60
TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60
TRH >C16-C34 (F3)	µg/L	500	<500
TRH >C34-C40 (F4)	µg/L	500	<500
TRH C10-C40	µg/L	320	<320
TRH C7-C9	µg/L	40	-

PAH (Polynuclear Aromatic Hydrocarbons) in Water [AN420] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Naphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Total PAH (18)	µg/L	1	<1	<1	<1	<1

Total Phenolics in Water [AN295] Tested: 25/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Total Phenols	mg/L	0.05	<0.05	<0.05	<0.05	<0.05

pH in water [AN101] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
pH**	pH Units	0.1	6.4	5.4	5.2	5.9

Conductivity and TDS by Calculation - Water [AN106] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Conductivity @ 25 C	µS/cm	2	400	330	310	330

Total Dissolved Solids (TDS) in water [AN113] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Total Dissolved Solids Dried at 175-185°C	mg/L	10	270	210	210	210

Turbidity [AN119] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Turbidity	NTU	0.5	99	130	120	780

Total Cyanide in water by Discrete Analyser [AN077/AN287] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Total Cyanide	mg/L	0.004	<0.004	<0.004	<0.004	<0.004

Metals in Water (Dissolved) by ICPOES [AN320] Tested: 25/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004
Calcium, Ca	mg/L	0.2	27	5.6	5.5	11
Magnesium, Mg	mg/L	0.1	6.8	5.4	2.0	5.4
Total Hardness by Calculation	mg CaCO3/L	1	94	36	22	49
Sodium Adsorption Ratio	No unit	0.2	-	-	-	2.8
Sodium, Na	mg/L	0.5	-	-	-	44
Potassium, K	mg/L	0.1	-	-	-	4.6
Lithium, Li	mg/L	0.005	-	-	-	<0.005
Silicon, Si*	mg/L	0.05	-	-	-	3.1
Soluble Silicon as Silica, SiO2*	mg/L	0.1	-	-	-	6.6

Trace Metals (Dissolved) in Water by ICPMS [AN318] Tested: 24/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
Aluminium	µg/L	5	10	120	120	21	10
Arsenic	µg/L	1	1	<1	<1	<1	1
Cadmium	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	µg/L	1	<1	<1	2	<1	<1
Copper	µg/L	1	2	6	3	<1	2
Lead	µg/L	1	<1	<1	<1	<1	<1
Nickel	µg/L	1	5	3	5	6	5
Zinc	µg/L	5	24	16	27	18	25
Silver	µg/L	1	-	-	-	<1	-
Antimony	µg/L	1	-	-	-	<1	-
Barium	µg/L	1	-	-	-	120	-
Beryllium	µg/L	1	-	-	-	<1	-
Boron	µg/L	5	-	-	-	33	-
Cobalt	µg/L	1	-	-	-	4	-
Iron	µg/L	5	-	-	-	1400	-
Manganese	µg/L	1	-	-	-	240	-
Molybdenum	µg/L	1	-	-	-	<1	-
Selenium	µg/L	1	-	-	-	3	-
Strontium	µg/L	1	-	-	-	65	-
Uranium	µg/L	1	-	-	-	<1	-
Vanadium	µg/L	1	-	-	-	<1	-

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006
Aluminium	µg/L	5	<5
Arsenic	µg/L	1	<1
Cadmium	µg/L	0.1	<0.1
Chromium	µg/L	1	<1
Copper	µg/L	1	<1
Lead	µg/L	1	<1
Nickel	µg/L	1	<1
Zinc	µg/L	5	<5
Silver	µg/L	1	-
Antimony	µg/L	1	-
Barium	µg/L	1	-
Beryllium	µg/L	1	-
Boron	µg/L	5	-
Cobalt	µg/L	1	-
Iron	µg/L	5	-
Manganese	µg/L	1	-
Molybdenum	µg/L	1	-
Selenium	µg/L	1	-
Strontium	µg/L	1	-
Uranium	µg/L	1	-
Vanadium	µg/L	1	-

Mercury (dissolved) in Water [AN311(Perth)/AN312] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH1M WATER - 18/9/2024 SE271241.001	BH2M WATER - 18/9/2024 SE271241.002	BH5M WATER - 18/9/2024 SE271241.003	BH3M WATER - 18/9/2024 SE271241.004	GQD1 WATER - 18/9/2024 SE271241.005
Mercury	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

PARAMETER	UOM	LOR	GQRB1 WATER - 18/9/2024 SE271241.006
Mercury	mg/L	0.0001	<0.0001

Anions by Ion Chromatography in Water [AN245] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Chloride	mg/L	0.05	**32**
Bromide	mg/L	0.05	<0.05
Fluoride	mg/L	0.1	<0.10
Sulfate, SO4	mg/L	1	**48**
Nitrate Nitrogen, NO3-N	mg/L	0.005	**0.20**

Alkalinity [AN135] Tested: 24/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Bicarbonate Alkalinity as CaCO3	mg/L	5	**59**
Bicarbonate Alkalinity as HCO3	mg/L	5	**72**
Carbonate Alkalinity as CaCO3	mg/L	5	<5
Carbonate Alkalinity as CO3	mg/L	5	<5
Hydroxide Alkalinity as CaCO3	mg/L	5	<5
Hydroxide Alkalinity as OH	mg/L	5	<5
Total Alkalinity as CaCO3	mg/L	5	**59**
Hydroxide Alkalinity as OH (meq/L)	meq/L	0.06	<0.06
Bicarbonate Alkalinity as HCO3 (meq/L)	meq/L	0.03	**1.2**
Carbonate Alkalinity as CO3 (meq/L)	meq/L	0.03	<0.03
Carbonate Hardness as CaCO3*	mg CaCO3/L	2	**58.7016**
Non-Carbonate Hardness as CaCO3*	mg CaCO3/L	2	-
Negative Hardness as CaCO3*	mg CaCO3/L	-100	-

Dissolved Oxygen by Membrane Electrode [AN176] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Temperature*	°C	-	**22.0**
Dissolved Oxygen**	mg/L	0.5	**3.2**
Dissolved Oxygen (percent saturation)**	%	1	**36.0**

Total and Volatile Suspended Solids (TSS / VSS) [AN114] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Total Suspended Solids Dried at 103-105°C	mg/L	5	590

Forms of Carbon [AN190] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Total Organic Carbon as NPOC	mg/L	0.2	**2.5**

Ammonia Nitrogen by Discrete Analyser [AN291] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Ammonia Nitrogen, NH_3 as N	mg/L	0.01	0.02

Calculation of Anion-Cation Balance (SAR Calc) [AN121] Tested: 25/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Sum of Ions*	mg/L	10	**205**
Anion-Cation Balance	%	-100	**-0.30**
TFSS*	mg/L	10	**205**
Sodium Adsorption Ratio*	No unit	0.1	**2.7**

Nitrite in Water [AN277] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Nitrite Nitrogen, NO2 as N	mg/L	0.005	**0.070**
Total Oxidised Nitrogen, NOx-N	mg/L	0.005	**0.27**

TKN Kjeldahl Digestion by Discrete Analyser [AN292] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Total Kjeldahl Nitrogen	mg/L	0.05	**0.43**
Total Nitrogen (calc)	mg/L	0.05	**0.70**

Total Phosphorus by Kjeldahl Digestion DA in Water [AN279/AN293(Sydney only)] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	**0.18**

Filterable Reactive Phosphorus (FRP) [AN278] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Filterable Reactive Phosphorus as P	mg/L	0.005	<0.005

Redox Potential (Eh) in water [AN240] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Eh of Sample Relative to Standard H+ Electrode***	mV	-500	281
Temperature of Sample*	°C	0.1	22.8

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples [AN404] Tested: 20/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	**0.05**
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	**0.02**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	**0.02**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01
Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	**0.03**
Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01
1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2	µg/L	0.01	<0.01
Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.01
N-Methylperfluoroctane sulfonamide (N-MeFOSA)	µg/L	0.01	<0.01
N-Ethylperfluoroctane sulfonamide (N-EtFOSA)	µg/L	0.01	<0.01
N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05
N-Ethylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05
2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05
2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05
Sum of PFOS and PFHxS	µg/L	0.01	**0.03**
Sum of enHealth PFAS (PFHxS+PFOS+PFOA)	µg/L	0.01	**0.05**
Sum of US EPA PFAS (PFOS+PFOA)	µg/L	0.01	**0.05**
Sum of PFAS A	µg/L	0.01	**0.05**
Sum of PFAS B	µg/L	0.01	<0.01
Sum of PFAS C	µg/L	0.01	**0.07**
Sum of Positive PFAS	µg/L	0.01	**0.12**

Enterococci in Water [AN705] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Date & Time Processed*	No unit	-	2024-09-19 13:05
Intestinal Enterococci*	CFU/100mL	1	<1
Notes*	No unit	-	-

E. coli and Thermotolerant coliforms in Water (CFU) [AN703] Tested: 19/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Date & Time Processed*	No unit	-	2024-09-19 13:05
E. coli	CFU/100mL	1	<1
Thermotolerant Coliforms	CFU/100mL	1	<1

OC Pesticides in Water [AN420] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Alpha BHC	µg/L	0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
Beta BHC	µg/L	0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1
Delta BHC	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Aldrin	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1
o,p'-DDE	µg/L	0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1
o,p'-DDD	µg/L	0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
o,p'-DDT	µg/L	0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
trans-Nonachlor	µg/L	0.1	<0.1
Endrin aldehyde	µg/L	0.1	<0.1
Isodrin	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1
Total OC	µg/L	1	<1
Total OC	µg/L	1	<1

OP Pesticides in Water [AN420] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Dichlorvos	µg/L	0.5	<0.5
Dimethoate	µg/L	0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2
Malathion	µg/L	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2
Methidathion	µg/L	0.5	<0.5
Ethion	µg/L	0.2	<0.2
Azinphos-methyl	µg/L	0.2	<0.2

PCBs in Water [AN420] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Arochlor 1016	µg/L	1	<1
Arochlor 1221	µg/L	1	<1
Arochlor 1232	µg/L	1	<1
Arochlor 1242	µg/L	1	<1
Arochlor 1248	µg/L	1	<1
Arochlor 1254	µg/L	1	<1
Arochlor 1260	µg/L	1	<1
Arochlor 1262	µg/L	1	<1
Arochlor 1268	µg/L	1	<1
Total Arochlors*	µg/L	5	<5

Full 8270 SVOC in Water [AN420] Tested: 23/9/2024

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Acenaphthene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
Benzo(b&j)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Dibenzo(ah)anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
Naphthalene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
2-acetylaminofluorene	µg/L	0.5	<0.5
7,12-dimethyl-benz(a)anthracene	µg/L	0.5	<0.5
3-methylcholanthrene	µg/L	0.5	<0.5
Aldrin	µg/L	0.1	<0.1
Alpha-BHC	µg/L	0.1	<0.1
Beta-BHC	µg/L	0.1	<0.1
Delta-BHC	µg/L	0.1	<0.1
Gamma-BHC (Lindane)	µg/L	0.1	<0.1
p,p-DDD	µg/L	0.1	<0.1
p,p-DDE	µg/L	0.1	<0.1
p,p-DDT	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Alpha-endosulfan	µg/L	0.1	<0.1
Beta-endosulfan	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
Isodrin	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1
Alpha-chlordane	µg/L	0.1	<0.1
Gamma-chlordane	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Azinphos-methyl (Guthion)	µg/L	0.2	<0.2
Bromophos ethyl	µg/L	0.2	<0.2
Carbophenothion	µg/L	0.5	<0.5
Chlorfenvinphos-cis	µg/L	5	<5
Chlorfenvinphos-trans	µg/L	0.5	<0.5
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
Chlorpyrifos-methyl	µg/L	0.5	<0.5
Co-Ral (Coumaphos)	µg/L	0.5	<0.5
Diazinon (Dimpylate)	µg/L	0.5	<0.5
Dichlorvos	µg/L	0.5	<0.5
1/2-Chloronaphthalene	µg/L	1	<1
Demeton-S-methyl	µg/L	0.5	<0.5
Dimethoate	µg/L	0.5	<0.5
Disulfoton (Di-syston)	µg/L	0.5	<0.5
EPN*	µg/L	0.5	<0.5

Full 8270 SVOC in Water [AN420] Tested: 23/9/2024 (continued)

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Ethion	µg/L	0.2	<0.2
Ethoprophos (ethoprop or prophos)	µg/L	0.5	<0.5
Famphur (Famophos)	µg/L	0.5	<0.5
Fenamiphos (Phenamiphos)	µg/L	0.5	<0.5
Fenchlorophos (Ronnel)	µg/L	0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2
Fenthion	µg/L	0.5	<0.5
Malathion (Maldison)	µg/L	0.2	<0.2
Methidathion	µg/L	0.5	<0.5
Mevinphos-cis/trans	µg/L	1	<1
o,o,o-triethyl phosphorothioate	µg/L	0.5	<0.5
Parathion ethyl (Parathion)	µg/L	0.2	<0.2
Parathion methyl	µg/L	0.5	<0.5
Phorate	µg/L	0.5	<0.5
Pirimiphos-ethyl	µg/L	0.5	<0.5
Pirimiphos-methyl	µg/L	0.5	<0.5
Profenofos	µg/L	0.5	<0.5
Prothiophos (Tokuthion)*	µg/L	0.5	<0.5
Sulfotepp	µg/L	0.5	<0.5
PCB Congener C28	µg/L	0.1	<0.1
PCB Congener C52	µg/L	0.1	<0.1
PCB Congener C101	µg/L	0.1	<0.1
PCB Congener C118	µg/L	0.1	<0.1
PCB Congener C138	µg/L	0.1	<0.1
PCB Congener C153	µg/L	0.1	<0.1
PCB Congener C180	µg/L	0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
1,2-dichlorobenzene	µg/L	0.5	<0.5
1,3-dichlorobenzene	µg/L	0.5	<0.5
1,4-dichlorobenzene	µg/L	0.5	<0.5
Hexachlorobutadiene	µg/L	0.5	<0.5
Hexachlorocyclopentadiene	µg/L	2	<2
Hexachloroethane	µg/L	0.5	<0.5
Hexachloroproprene	µg/L	0.5	<0.5
Pentachlorobenzene	µg/L	0.5	<0.5
Pentachloroethane	µg/L	0.5	<0.5
1,2,3,5 and 1,2,4,5 -tetrachlorobenzene	µg/L	1	<1
1,2,3,4-tetrachlorobenzene	µg/L	0.5	<0.5
1,2,4-trichlorobenzene	µg/L	0.5	<0.5
Bis(2-ethylhexyl)phthalate	µg/L	50	<50
Bis(2-ethylhexyl)adipate	µg/L	1	<1
Butyl benzyl phthalate	µg/L	1	<1
Di-n-butyl phthalate	µg/L	10	<10
Diethyl phthalate	µg/L	5	<5
Dimethyl phthalate	µg/L	1	<1
Di-n-octyl phthalate	µg/L	1	<1
Carbofuran	µg/L	0.5	<0.5
Carbaryl	µg/L	0.5	<0.5
Trifluralin	µg/L	0.5	<0.5
N-nitroso-di-n-butylamine (NDBA)	µg/L	1	<1
N-nitroso-diethylamine (NDEA)	µg/L	1	<1
N-nitroso-di-n-propylamine (NDPA)	µg/L	1	<1
N-nitroso-morpholine (NMOR)	µg/L	1	<1
N-nitroso-piperidine (NPIP)	µg/L	1	<1
N-nitroso-pyrrolidine (NPYR)	µg/L	1	<1
4-amino biphenyl	µg/L	1	<1

Full 8270 SVOC in Water [AN420] Tested: 23/9/2024 (continued)

PARAMETER	UOM	LOR	BH3M WATER - 18/9/2024 SE271241.004
Acetophenone	µg/L	1	<1
1,3-dinitrobenzene	µg/L	1	<1
2,4-dinitrotoluene	µg/L	1	<1
2,6-dinitrotoluene	µg/L	1	<1
Isophorone	µg/L	1	<1
Nitrobenzene	µg/L	1	<1
p-(dimethylamino) azobenzene	µg/L	1	<1
Phenacetin	µg/L	1	<1
Pentachloronitrobenzene (quintozene)	µg/L	1	<1
Aniline	µg/L	5	<5
4-chloroaniline	µg/L	1	<1
2-nitroaniline	µg/L	1	<1
3-nitroaniline	µg/L	1	<1
4-nitroaniline	µg/L	1	<1
Diphenylamine	µg/L	1	<1
o-toluidine	µg/L	1	<1
5-nitro-o-toluidine	µg/L	1	<1
1-naphthylamine	µg/L	2	<2
2-naphthylamine	µg/L	2	<2
Bis(2-chloroethoxy) methane	µg/L	1	<1
Bis(2-chloroethyl) ether	µg/L	1	<1
Bis(2-chloroisopropyl) ether	µg/L	1	<1
4-chlorophenyl phenyl ether	µg/L	1	<1
4-bromophenyl phenyl ether	µg/L	1	<1
Methyl methanesulfonate	µg/L	1	<1
Ethyl methanesulfonate	µg/L	1	<1
Dibenzofuran	µg/L	1	<1
Benzyl alcohol	µg/L	1	<1
Safrole	µg/L	1	<1
Isosafrole Isomer 1	µg/L	1	<1
Isosafrole Isomer 2	µg/L	1	<1
1,4-naphthoquinone	µg/L	1	<1
Thionazin	µg/L	1	<1
3/4-methyl phenol (m/p-cresol)	µg/L	1	<1
2-methyl phenol (o-cresol)	µg/L	0.5	<0.5
2,6-dichlorophenol	µg/L	0.5	<0.5
2,3,4,6 and 2,3,5,6-tetrachlorophenol	µg/L	1	<1
2,4,5-trichlorophenol	µg/L	0.5	<0.5
4-chloro-3-methylphenol	µg/L	2	<2
2-chlorophenol	µg/L	0.5	<0.5
2,4-dichlorophenol	µg/L	0.5	<0.5
2,4-dimethylphenol	µg/L	0.5	<0.5
2-nitrophenol	µg/L	0.5	<0.5
Phenol	µg/L	0.5	<0.5
2,4,6-trichlorophenol	µg/L	0.5	<0.5
Pentachlorophenol	µg/L	0.5	<0.5
4-nitrophenol	µg/L	1	<1
Total Endosulfan (alpha+beta+sulfate)	µg/L	0.2	<0.2

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN077	Hydrogen cyanide is liberated from an acidified sample by distillation and purging with air. The hydrogen cyanide gas is then collected by passing it through a sodium hydroxide scrubbing solution. The scrubbing solution will then be analysed for cyanide by the appropriate method.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN106	Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos /cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2510 B.
AN106	Salinity may be calculated in terms of NaCl from the sample conductivity. This assumes all soluble salts present, measured by the conductivity, are present as NaCl.
AN113	Total Dissolved Solids: A well-mixed filtered sample of known volume is evaporated to dryness at 180°C and the residue weighed. Approximate methods for correlating chemical analysis with dissolved solids are available. Reference APHA 2540 C.
AN113	The Total Dissolved Solids residue may also be ignited at 550 C and volatile TDS (Organic TDS) and non-volatile TDS (Inorganic) can be determined.
AN114	Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D. Internal Reference AN114
AN119	Turbidity by Nepholometry: Small particles in a light beam scatter light at a range of angles. A turbidimeter measures this scatter and reports results compared to turbidity standards, in NTU. This procedure is not suitable for very dark coloured liquids or samples with high solids because light absorption causes artificially low light scatter and low turbidity. Reference APHA 2130B.
AN121	This method is used to calculation the balance of major Anions and Cations in water samples and converts major ion concentration to milliequivalents and then summed. Anions sum and Cation sum is calculated as a difference and expressed as a percentage.
AN135	Alkalinity (and forms of) by Titration: The sample is titrated with standard acid to pH 8.3 (P titre) and pH 4.5 (T titre) and permanent and/or total alkalinity calculated. The results are expressed as equivalents of calcium carbonate or recalculated as bicarbonate, carbonate and hydroxide. Reference APHA 2320. Internal Reference AN135
AN176	Dissolved Oxygen: Dissolved oxygen is measured directly using an oxygen permeable membrane electrode and meter. Under steady state conditions the current is directly proportional to the DO concentration. Samples with no headspace are required for this analysis and if headspace is observed this will be recorded on the report. Internal Reference is AN176 based on APHA 4500-O, C and G.
AN190	TOC and DOC in Water: A homogenised micro portion of sample is injected into a heated reaction chamber packed with an oxidative catalyst that converts organic carbon to carbon dioxide. The CO2 is measured using a non-dispersive infrared detector. The process is fully automated in a commercially available analyser. If required a sugar value can be calculated from the TOC result. Reference APHA 5310 B.
AN190	Chemical oxygen demand can be calculated/estimated based on the O2/C relation as 2.67*NPOC (TOC). This is an estimate only and the factor will vary with sample matrix so results should be interpreted with caution.
AN240	Oxidation-Reduction Potential (Eh): Electrometric measurements are made by potentiometric determination of electron activity (or intensity) with an inert indicator electrode and a suitable reference electrode. At redox equilibrium, the potential difference between the two electrodes equals the redox potential of the system. This measurement is then corrected for the difference between the potential of the reference electrode and that of the standard hydrogen electrode.
AN245	Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
AN277	Nitrite ions, when reacted with a reagent containing sulphanilamide and N-(1-naphthyl)-ethylenediamine dihydrochloride produce a highly coloured azo dye that is measured photometrically at 540nm.

AN278	Filterable Reactive Phosphorus by DA (determined on filtered sample): Orthophosphate reacts with ammonium molybdate (Mo VI) and potassium antimonyl tartrate (Sb III) in acid medium to form an antimony-phosphomolybdate complex. This complex is subsequently reduced with ascorbic acid to form a blue colour and the absorbance is read at 880 nm. The sensitivity of the automated method is 10-20 times that of the macro method. Reference APHA 4500-P F
AN279/AN293(Sydney)	The sample is digested with Sulphuric acid, K2SO4 and CuSO4. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.
AN281	An unfiltered water or soil sample is first digested in a block digestor with sulfuric acid, K2SO4 and CuSO4. The ammonia produced following digestion is then measured colourimetrically using the Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
AN287	A buffered distillate or water sample is treated with chloramine/barbituric acid reagents and the intensity of the colour developed is proportional to the cyanide concentration by DA.
AN291	Ammonia in solution reacts with hypochlorite ions from Sodium Dichloroisocyanuate, and salicylate in the presence of Sodium Nitroprusside to form indophenol blue and measured at 660 nm by Discrete Analyser.
AN295	The water sample or extract of sample is distilled in a phosphoric acid stream. Phenolic compounds in the distillate react with a reagent stream of potassium hexacyanoferrate(III) and 4-Amino-2,3-dimethyl-3-pryazolin-5-one in an alkaline medium to form a coloured complex which is analysed spectrophotometrically onboard a continuous flow analyser.
AN311(Perth)/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique,, referenced to USEPA 6020B and USEPA 200.8 (5.4).
AN320	Metals by ICP-OES: Samples are preserved with 10% nitric acid for a wide range of metals and some non-metals. This solution is measured by Inductively Coupled Plasma. Solutions are aspirated into an argon plasma at 8000-10000K and emit characteristic energy or light as a result of electron transitions through unique energy levels. The emitted light is focused onto a diffraction grating where it is separated into components .
AN320	Photomultipliers or CCDs are used to measure the light intensity at specific wavelengths. This intensity is directly proportional to concentration. Corrections are required to compensate for spectral overlap between elements . Reference APHA 3120 B.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). Where F2 is corrected for Naphthalene, the VOC data for Naphthalene is used.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoveerable Hydrocarbons - Silica (TRH-Silica) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN404	This method covers the analysis of per- and polyfluoroalkyl substances (PFAS) in aqueous, solid and biosolid samples and solvent extracts. After spiking with isotopically labelled quantification surrogates and sample extracts are analysed by liquid chromatography/mass spectrometry (LC-MS/MS). PFAS concentrations are determined by isotope dilution quantification. PFOS and PFHXS are determined as the total of linear and branched isomers.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D). Total PAH calculated from individual analyte detections at or above the limit of reporting .
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

AN703	A known volume of water is passed through a membrane of known pore size. The membrane is placed on a selective agar plate and incubated. The volume of sample filtered depends upon the expected count. Referenced to AS4276.5.
AN705	A known volume of water is passed through a membrane of known pore size. The membrane is placed on a selective agar plate and incubated. The volume of sample filtered depends upon the expected count. Referenced to AS/NZS4276.9 (ISO 7899-2:2000 MOD).
Calculation	Free and Total Carbon Dioxide may be calculated using alkalinity forms only when the samples TDS is <500mg/L. If TDS is >500mg/L free or total carbon dioxide cannot be reported. APHA4500CO2 D.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
**	Indicative data, theoretical holding time exceeded.	NVL	Not validated.	LOR	Limit of Reporting.
***	Indicates that both * and ** apply.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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STATEMENT OF QA/QC PERFORMANCE

SE271241 R0

CLIENT DETAILS

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Project	**E26484, 300 Burns Bay Rd, Lane Cove**
Order Number	**E26484**
Samples	8

LABORATORY DETAILS

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SGS Reference	**SE271241 R0**
Date Received	18 Sep 2024
Date Reported	25 Sep 2024

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Analysis Date	Nitrite in Water	1 item
Surrogate	Full 8270 SVOC in Water	1 item
Duplicate	VOCs in Water	1 item
	Volatile Petroleum Hydrocarbons in Water	1 item
Matrix Spike	Trace Metals (Dissolved) in Water by ICPMS	1 item

SAMPLE SUMMARY

Type of documentation received	COC	Date documentation received	18/09/2024
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	8.9°C	Sample container provider	SGS
Turnaround time requested	Standard	Samples received in correct containers	Yes
Sufficient sample for analysis	Yes	Sample cooling method	Ice Bricks
Samples clearly labelled	Yes	Complete documentation received	Yes
Sample counts by matrix	8 Water		

HOLDING TIME SUMMARY

SE271241 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324677	18 Sep 2024	18 Sep 2024	02 Oct 2024	24 Sep 2024	02 Oct 2024	25 Sep 2024

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324305	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324383	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	24 Sep 2024

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324331	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024
BH2M	SE271241.002	LB324331	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024
BH5M	SE271241.003	LB324331	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024
BH3M	SE271241.004	LB324331	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024

Dissolved Oxygen by Membrane Electrode

Method: ME-(AU)-[ENV]AN176

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324259	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024

E. coli and Thermotolerant coliforms in Water (CFU)

Method: ME-(AU)-[ENV]AN703

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324272	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	22 Sep 2024	19 Sep 2024

Enterococci in Water

Method: ME-(AU)-[ENV]AN705

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324272	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	22 Sep 2024	20 Sep 2024

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324305	18 Sep 2024	18 Sep 2024	16 Oct 2024	19 Sep 2024	16 Oct 2024	19 Sep 2024

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324550	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	25 Sep 2024	25 Sep 2024

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024
BH2M	SE271241.002	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024
BH5M	SE271241.003	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024
BH3M	SE271241.004	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024
GQD1	SE271241.005	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024
GQRB1	SE271241.006	LB324373	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref

HOLDING TIME SUMMARY

SE271241 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

Metals in Water (Dissolved) by ICPOES (continued)

Method: ME-(AU)-[ENV]AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324853	18 Sep 2024	18 Sep 2024	17 Mar 2025	25 Sep 2024	17 Mar 2025	25 Sep 2024
BH2M	SE271241.002	LB324853	18 Sep 2024	18 Sep 2024	17 Mar 2025	25 Sep 2024	17 Mar 2025	25 Sep 2024
BH5M	SE271241.003	LB324853	18 Sep 2024	18 Sep 2024	17 Mar 2025	25 Sep 2024	17 Mar 2025	25 Sep 2024
BH3M	SE271241.004	LB324853	18 Sep 2024	18 Sep 2024	17 Mar 2025	25 Sep 2024	17 Mar 2025	25 Sep 2024

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324305	18 Sep 2024	18 Sep 2024	22 Sep 2024	19 Sep 2024	22 Sep 2024	24 Sep 2024†

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	25 Sep 2024

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324401	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	18 Oct 2024	23 Sep 2024

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324331	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH2M	SE271241.002	LB324331	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH5M	SE271241.003	LB324331	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH3M	SE271241.004	LB324331	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024

Redox Potential (Eh) in water

Method: ME-(AU)-[ENV]AN240

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324332	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024

HOLDING TIME SUMMARY

SE271241 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN292

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324402	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	24 Sep 2024

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324300	18 Sep 2024	18 Sep 2024	25 Sep 2024	19 Sep 2024	26 Sep 2024	19 Sep 2024

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324547	18 Sep 2024	18 Sep 2024	02 Oct 2024	23 Sep 2024	02 Oct 2024	23 Sep 2024
BH2M	SE271241.002	LB324547	18 Sep 2024	18 Sep 2024	02 Oct 2024	23 Sep 2024	02 Oct 2024	23 Sep 2024
BH5M	SE271241.003	LB324547	18 Sep 2024	18 Sep 2024	02 Oct 2024	23 Sep 2024	02 Oct 2024	23 Sep 2024
BH3M	SE271241.004	LB324547	18 Sep 2024	18 Sep 2024	02 Oct 2024	23 Sep 2024	02 Oct 2024	23 Sep 2024

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324411	18 Sep 2024	18 Sep 2024	25 Sep 2024	20 Sep 2024	25 Sep 2024	23 Sep 2024
BH2M	SE271241.002	LB324411	18 Sep 2024	18 Sep 2024	25 Sep 2024	20 Sep 2024	25 Sep 2024	23 Sep 2024
BH5M	SE271241.003	LB324411	18 Sep 2024	18 Sep 2024	25 Sep 2024	20 Sep 2024	25 Sep 2024	23 Sep 2024
BH3M	SE271241.004	LB324411	18 Sep 2024	18 Sep 2024	25 Sep 2024	20 Sep 2024	25 Sep 2024	23 Sep 2024

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324838	18 Sep 2024	18 Sep 2024	02 Oct 2024	25 Sep 2024	02 Oct 2024	25 Sep 2024
BH2M	SE271241.002	LB324838	18 Sep 2024	18 Sep 2024	02 Oct 2024	25 Sep 2024	02 Oct 2024	25 Sep 2024
BH5M	SE271241.003	LB324838	18 Sep 2024	18 Sep 2024	02 Oct 2024	25 Sep 2024	02 Oct 2024	25 Sep 2024
BH3M	SE271241.004	LB324838	18 Sep 2024	18 Sep 2024	02 Oct 2024	25 Sep 2024	02 Oct 2024	25 Sep 2024

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324402	18 Sep 2024	18 Sep 2024	16 Oct 2024	20 Sep 2024	16 Oct 2024	23 Sep 2024

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024
BH2M	SE271241.002	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024
BH5M	SE271241.003	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024
BH3M	SE271241.004	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024
GQD1	SE271241.005	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024
GQRB1	SE271241.006	LB324724	18 Sep 2024	18 Sep 2024	17 Mar 2025	24 Sep 2024	17 Mar 2025	24 Sep 2024

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024
BH2M	SE271241.002	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024
BH5M	SE271241.003	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024
BH3M	SE271241.004	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024
GQD1	SE271241.005	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024
GQRB1	SE271241.006	LB324539	18 Sep 2024	18 Sep 2024	25 Sep 2024	23 Sep 2024	02 Nov 2024	24 Sep 2024

Turbidity

Method: ME-(AU)-[ENV]AN119

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324333	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH2M	SE271241.002	LB324333	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH5M	SE271241.003	LB324333	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024
BH3M	SE271241.004	LB324333	18 Sep 2024	18 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024	19 Sep 2024

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
BH2M	SE271241.002	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
BH5M	SE271241.003	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the

VOCs in Water (continued) — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH3M	SE271241.004	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQD1	SE271241.005	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQRB1	SE271241.006	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQTS1	SE271241.007	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQTB1	SE271241.008	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1M	SE271241.001	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
BH2M	SE271241.002	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
BH5M	SE271241.003	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
BH3M	SE271241.004	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQD1	SE271241.005	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQRB1	SE271241.006	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQTS1	SE271241.007	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024
GQTB1	SE271241.008	LB324308	18 Sep 2024	18 Sep 2024	02 Oct 2024	19 Sep 2024	02 Oct 2024	23 Sep 2024

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	BH3M	SE271241.004	%	40 - 130%	33 ①
2-fluorobiphenyl (Surrogate)	BH3M	SE271241.004	%	40 - 130%	46
d14-p-terphenyl (Surrogate)	BH3M	SE271241.004	%	40 - 130%	62
d5-nitrobenzene (Surrogate)	BH3M	SE271241.004	%	40 - 130%	52
d5-phenol (Surrogate)	BH3M	SE271241.004	%	20 - 130%	67

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	BH3M	SE271241.004	%	40 - 130%	70

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH3M	SE271241.004	%	40 - 130%	76
d14-p-terphenyl (Surrogate)	BH3M	SE271241.004	%	40 - 130%	88

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	BH1M	SE271241.001	%	40 - 130%	79
	BH2M	SE271241.002	%	40 - 130%	84
	BH5M	SE271241.003	%	40 - 130%	81
	BH3M	SE271241.004	%	40 - 130%	76
d14-p-terphenyl (Surrogate)	BH1M	SE271241.001	%	40 - 130%	94
	BH2M	SE271241.002	%	40 - 130%	98
	BH5M	SE271241.003	%	40 - 130%	92
	BH3M	SE271241.004	%	40 - 130%	88
d5-nitrobenzene (Surrogate)	BH1M	SE271241.001	%	40 - 130%	72
	BH2M	SE271241.002	%	40 - 130%	78
	BH5M	SE271241.003	%	40 - 130%	79
	BH3M	SE271241.004	%	40 - 130%	71

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
TCMX (Surrogate)	BH3M	SE271241.004	%	40 - 130%	70

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
(13C2_PFTeDA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	63
(13C2-4:2 FTS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 300%	106
(13C2-6:2 FTS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 300%	105
(13C2-8:2 FTS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 300%	64
(13C2-PFDoA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	56
(13C3-PFBS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	100
(13C3-PFHxS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	100
(13C4_PFOA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	100
(13C4-PFBA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	5 - 150%	96
(13C4-PFHpA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	102
(13C5-PFHxA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	104
(13C5-PFPeA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	35 - 150%	102
(13C6-PFDA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	84
(13C7-PFUdA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	30 - 150%	65
(13C8-PFOS) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	87
(13C8-PFOSA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	20 - 150%	68
(13C9-PFNA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	40 - 150%	107
(D3-N-MeFOSA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	60
(D3-N-MeFOSAA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	30 - 170%	62
(D5-N-EtFOSA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	63
(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	20 - 150%	71
(D7-N-MeFOSE) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	62
(D9-N-EtFOSE) Isotopically Labelled Internal Recovery Standard	BH3M	SE271241.004	%	10 - 150%	59

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M	SE271241.001	%	40 - 130%	82
	BH2M	SE271241.002	%	40 - 130%	80
	BH5M	SE271241.003	%	40 - 130%	83
	BH3M	SE271241.004	%	40 - 130%	80
	GQD1	SE271241.005	%	40 - 130%	81
	GQRB1	SE271241.006	%	40 - 130%	78
	GQTS1	SE271241.007	%	40 - 130%	108
	GQTB1	SE271241.008	%	40 - 130%	77
d4-1,2-dichloroethane (Surrogate)	BH1M	SE271241.001	%	40 - 130%	100
	BH2M	SE271241.002	%	40 - 130%	102
	BH5M	SE271241.003	%	40 - 130%	103
	BH3M	SE271241.004	%	40 - 130%	90
	GQD1	SE271241.005	%	40 - 130%	104
	GQRB1	SE271241.006	%	40 - 130%	90
	GQTS1	SE271241.007	%	40 - 130%	99
	GQTB1	SE271241.008	%	40 - 130%	99
d8-toluene (Surrogate)	BH1M	SE271241.001	%	40 - 130%	92
	BH2M	SE271241.002	%	40 - 130%	84
	BH5M	SE271241.003	%	40 - 130%	85
	BH3M	SE271241.004	%	40 - 130%	71
	GQD1	SE271241.005	%	40 - 130%	87
	GQRB1	SE271241.006	%	40 - 130%	79
	GQTS1	SE271241.007	%	40 - 130%	89
	GQTB1	SE271241.008	%	40 - 130%	85

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	BH1M	SE271241.001	%	40 - 130%	82
	BH2M	SE271241.002	%	40 - 130%	80
	BH5M	SE271241.003	%	40 - 130%	83
	BH3M	SE271241.004	%	40 - 130%	80
	GQD1	SE271241.005	%	40 - 130%	81
	GQRB1	SE271241.006	%	40 - 130%	78
d4-1,2-dichloroethane (Surrogate)	BH1M	SE271241.001	%	60 - 130%	100
	BH2M	SE271241.002	%	60 - 130%	102
	BH5M	SE271241.003	%	60 - 130%	103
	BH3M	SE271241.004	%	60 - 130%	90
	GQD1	SE271241.005	%	60 - 130%	104
	GQRB1	SE271241.006	%	60 - 130%	90
d8-toluene (Surrogate)	BH1M	SE271241.001	%	40 - 130%	92
	BH2M	SE271241.002	%	40 - 130%	84
	BH5M	SE271241.003	%	40 - 130%	85
	BH3M	SE271241.004	%	40 - 130%	71
	GQD1	SE271241.005	%	40 - 130%	87
	GQRB1	SE271241.006	%	40 - 130%	79

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Alkalinity

Method: ME-(AU)-[ENV]AN135

Sample Number	Parameter	Units	LOR	Result
LB324677.001	Bicarbonate Alkalinity as CaCO3	mg/L	5	<5
	Carbonate Alkalinity as CaCO3	mg/L	5	<5
	Total Alkalinity as CaCO3	mg/L	5	<5
LB324677.025	Bicarbonate Alkalinity as CaCO3	mg/L	5	<5
	Carbonate Alkalinity as CaCO3	mg/L	5	<5
	Total Alkalinity as CaCO3	mg/L	5	<5

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Number	Parameter	Units	LOR	Result
LB324305.001	Ammonia Nitrogen, NH_3 as N	mg/L	0.01	<0.01

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB324383.001	Fluoride	mg/L	0.1	<0.10
	Chloride	mg/L	0.05	<0.05
	Bromide	mg/L	0.05	<0.05
	Nitrate Nitrogen, NO3-N	mg/L	0.005	<0.005
	Sulfate, SO4	mg/L	1	<1.0

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB324331.001	Conductivity @ 25 C	µS/cm	2	<2

Dissolved Oxygen by Membrane Electrode

Method: ME-(AU)-[ENV]AN176

Sample Number	Parameter	Units	LOR	Result
LB324259.001	Dissolved Oxygen**	mg/L	0.5	<0.5

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result
LB324305.001	Filterable Reactive Phosphorus as P	mg/L	0.005	<0.005

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Number	Parameter	Units	LOR	Result
LB324550.001	Total Organic Carbon as NPOC	mg/L	0.2	<0.2

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001	01-PAHs	Acenaphthene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		Naphthalene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		2-acetylaminofluorene	µg/L	0.5	<0.5
		7,12-dimethyl-benz(a)anthracene	µg/L	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001	01-PAHs	3-methylcholanthrene	µg/L	0.5	<0.5
	02-OCs	Aldrin	µg/L	0.1	<0.1
		Alpha-BHC	µg/L	0.1	<0.1
		Beta-BHC	µg/L	0.1	<0.1
		Delta-BHC	µg/L	0.1	<0.1
		Gamma-BHC (Lindane)	µg/L	0.1	<0.1
		p,p-DDD	µg/L	0.1	<0.1
		p,p-DDE	µg/L	0.1	<0.1
		p,p-DDT	µg/L	0.1	<0.1
		Dieldrin	µg/L	0.1	<0.1
		Alpha-endosulfan	µg/L	0.1	<0.1
		Beta-endosulfan	µg/L	0.1	<0.1
		Endosulfan sulphate	µg/L	0.1	<0.1
		Endrin	µg/L	0.1	<0.1
		Heptachlor	µg/L	0.1	<0.1
		Heptachlor epoxide	µg/L	0.1	<0.1
		Isodrin	µg/L	0.1	<0.1
		Methoxychlor	µg/L	0.1	<0.1
		Mirex	µg/L	0.1	<0.1
		Alpha-chlordane	µg/L	0.1	<0.1
		Gamma-chlordane	µg/L	0.1	<0.1
		Endrin ketone	µg/L	0.1	<0.1
	03-OPs	Azinphos-methyl (Guthion)	µg/L	0.2	<0.2
		Bromophos ethyl	µg/L	0.2	<0.2
		Carbophenothion	µg/L	0.5	<0.5
		Chlorfenvinphos-cis	µg/L	5	<5
		Chlorfenvinphos-trans	µg/L	0.5	<0.5
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
		Chlorpyrifos-methyl	µg/L	0.5	<0.5
		Co-Ral (Coumaphos)	µg/L	0.5	<0.5
		Diazinon (Dimpylate)	µg/L	0.5	<0.5
		Dichlorvos	µg/L	0.5	<0.5
		Demeton-S-methyl	µg/L	0.5	<0.5
		Dimethoate	µg/L	0.5	<0.5
		Disulfoton (Di-syston)	µg/L	0.5	<0.5
		EPN*	µg/L	0.5	<0.5
		Ethion	µg/L	0.2	<0.2
		Ethoprophos (ethoprop or prophos)	µg/L	0.5	<0.5
		Famphur (Famophos)	µg/L	0.5	<0.5
		Fenamiphos (Phenamiphos)	µg/L	0.5	<0.5
		Fenchlorophos (Ronnel)	µg/L	0.5	<0.5
		Fenitrothion	µg/L	0.2	<0.2
		Fenthion	µg/L	0.5	<0.5
		Malathion (Maldison)	µg/L	0.2	<0.2
		Methidathion	µg/L	0.5	<0.5
		Mevinphos-cis/trans	µg/L	1	<1
		o,o,o-triethyl phosphorothioate	µg/L	0.5	<0.5
		Parathion ethyl (Parathion)	µg/L	0.2	<0.2
		Parathion methyl	µg/L	0.5	<0.5
		Phorate	µg/L	0.5	<0.5
		Pirimiphos-ethyl	µg/L	0.5	<0.5
		Pirimiphos-methyl	µg/L	0.5	<0.5
		Profenofos	µg/L	0.5	<0.5
		Prothiophos (Tokuthion)*	µg/L	0.5	<0.5
		Sulfotepp	µg/L	0.5	<0.5
	04-PCB UPAC(7) Congeners	PCB Congener C28	µg/L	0.1	<0.1
		PCB Congener C52	µg/L	0.1	<0.1
		PCB Congener C101	µg/L	0.1	<0.1
		PCB Congener C118	µg/L	0.1	<0.1
		PCB Congener C138	µg/L	0.1	<0.1
		PCB Congener C153	µg/L	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001	04-PCB UPAC(7)	PCB Congener C180	µg/L	0.1	<0.1
	05-SVCH (Cl Benzenes, Hydrocarbons & VOCs)	Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
		Hexachlorocyclopentadiene	µg/L	2	<2
		Hexachloroethane	µg/L	0.5	<0.5
		Hexachloroproprene	µg/L	0.5	<0.5
		Pentachlorobenzene	µg/L	0.5	<0.5
		Pentachloroethane	µg/L	0.5	<0.5
		1,2,3,5 and 1,2,4,5 -tetrachlorobenzene	µg/L	1	<1
		1,2,3,4-tetrachlorobenzene	µg/L	0.5	<0.5
		1/2-Chloronaphthalene	µg/L	1	<1
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
	06-Phthalates	Bis(2-ethylhexyl)phthalate	µg/L	50	<50
		Bis(2-ethylhexyl)adipate	µg/L	1	<1
		Butyl benzyl phthalate	µg/L	1	<1
		Di-n-butyl phthalate	µg/L	10	<10
		Diethyl phthalate	µg/L	5	<5
		Dimethyl phthalate	µg/L	1	<1
		Di-n-octyl phthalate	µg/L	1	<1
	07-Carbamates	Carbofuran	µg/L	0.5	<0.5
		Carbaryl	µg/L	0.5	<0.5
	08-Herbicides (normal)	Trifluralin	µg/L	0.5	<0.5
	09-Nitrosamines	N-nitroso-di-n-butylamine (NDBA)	µg/L	1	<1
		N-nitroso-diethylamine (NDEA)	µg/L	1	<1
		N-nitroso-di-n-propylamine (NDPA)	µg/L	1	<1
		N-nitroso-morpholine (NMOR)	µg/L	1	<1
		N-nitroso-piperidine (NPIP)	µg/L	1	<1
		N-nitroso-pyrrolidine (NPYR)	µg/L	1	<1
		4-amino biphenyl	µg/L	1	<1
	10-Nitroaromatics and Ketones	Acetophenone	µg/L	1	<1
		1,3-dinitrobenzene	µg/L	1	<1
		2,4-dinitrotoluene	µg/L	1	<1
		2,6-dinitrotoluene	µg/L	1	<1
		Isophorone	µg/L	1	<1
		Nitrobenzene	µg/L	1	<1
		p-(dimethylamino) azobenzene	µg/L	1	<1
		Phenacetin	µg/L	1	<1
		Pentachloronitrobenzene (quintozene)	µg/L	1	<1
	11-Anilines and Amines	Aniline	µg/L	5	<5
		4-chloroaniline	µg/L	1	<1
		2-nitroaniline	µg/L	1	<1
		3-nitroaniline	µg/L	1	<1
		4-nitroaniline	µg/L	1	<1
		Diphenylamine	µg/L	1	<1
		o-toluidine	µg/L	1	<1
		5-nitro-o-toluidine	µg/L	1	<1
		1-naphthylamine	µg/L	2	<2
		2-naphthylamine	µg/L	2	<2
	12-Haloethers	Bis(2-chloroethoxy) methane	µg/L	1	<1
		Bis(2-chloroethyl) ether	µg/L	1	<1
		Bis(2-chloroisopropyl) ether	µg/L	1	<1
		4-chlorophenyl phenyl ether	µg/L	1	<1
		4-bromophenyl phenyl ether	µg/L	1	<1
	13-Other SVOCs	Methyl methanesulfonate	µg/L	1	<1
		Ethyl methanesulfonate	µg/L	1	<1
		Dibenzofuran	µg/L	1	<1
		Benzyl alcohol	µg/L	1	<1
		Safrole	µg/L	1	<1

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Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001	13-Other SVOCs	Isosafrole Isomer 1	µg/L	1	<1
		Isosafrole Isomer 2	µg/L	1	<1
		1,4-naphthoquinone	µg/L	1	<1
		Thionazin	µg/L	1	<1
	14-Speciated Routine Phenols	3/4-methyl phenol (m/p-cresol)	µg/L	1	<1
		2-methyl phenol (o-cresol)	µg/L	0.5	<0.5
		2,6-dichlorophenol	µg/L	0.5	<0.5
		2,3,4,6 and 2,3,5,6-tetrachlorophenol	µg/L	1	<1
		2,4,5-trichlorophenol	µg/L	0.5	<0.5
		4-chloro-3-methylphenol	µg/L	2	<2
		2-chlorophenol	µg/L	0.5	<0.5
		2,4-dichlorophenol	µg/L	0.5	<0.5
		2,4-dimethylphenol	µg/L	0.5	<0.5
		2-nitrophenol	µg/L	0.5	<0.5
		Phenol	µg/L	0.5	<0.5
		2,4,6-trichlorophenol	µg/L	0.5	<0.5
		Pentachlorophenol	µg/L	0.5	<0.5
		4-nitrophenol	µg/L	1	<1
	Surrogates	d5-phenol (Surrogate)	%	-	113
		d5-nitrobenzene (Surrogate)	%	-	98
		2-fluorobiphenyl (Surrogate)	%	-	74
		2,4,6-Tribromophenol (Surrogate)	%	-	98
		d14-p-terphenyl (Surrogate)	%	-	88

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

Sample Number	Parameter	Units	LOR	Result
LB324373.001	Mercury	mg/L	0.0001	<0.0001

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result
LB324853.001	Calcium, Ca	mg/L	0.2	<0.2
	Magnesium, Mg	mg/L	0.1	<0.1
	Potassium, K	mg/L	0.1	<0.1
	Silicon, Si*	mg/L	0.05	<0.05
	Sodium, Na	mg/L	0.5	<0.5

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Sample Number	Parameter	Units	LOR	Result
LB324305.001	Nitrite Nitrogen, NO2 as N	mg/L	0.005	<0.005

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB324539.001	Alpha BHC	µg/L	0.1	<0.1
	Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
	Beta BHC	µg/L	0.1	<0.1
	Lindane (gamma BHC)	µg/L	0.1	<0.1
	Delta BHC	µg/L	0.1	<0.1
	Heptachlor	µg/L	0.1	<0.1
	Aldrin	µg/L	0.1	<0.1
	Isodrin	µg/L	0.1	<0.1
	Heptachlor epoxide	µg/L	0.1	<0.1
	Gamma Chlordane	µg/L	0.1	<0.1
	Alpha Chlordane	µg/L	0.1	<0.1
	Alpha Endosulfan	µg/L	0.1	<0.1
	p,p'-DDE	µg/L	0.1	<0.1
	Dieldrin	µg/L	0.1	<0.1
	Endrin	µg/L	0.1	<0.1
	Beta Endosulfan	µg/L	0.1	<0.1
	p,p'-DDD	µg/L	0.1	<0.1

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OC Pesticides in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001		Endrin aldehyde	µg/L	0.1	<0.1
		Endosulfan sulphate	µg/L	0.1	<0.1
		p,p'-DDT	µg/L	0.1	<0.1
		Endrin ketone	µg/L	0.1	<0.1
		Methoxychlor	µg/L	0.1	<0.1
		Mirex	µg/L	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	83

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001		Azinphos-methyl	µg/L	0.2	<0.2
		Bromophos Ethyl	µg/L	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
		Diazinon (Dimpylate)	µg/L	0.5	<0.5
		Dichlorvos	µg/L	0.5	<0.5
		Dimethoate	µg/L	0.5	<0.5
		Ethion	µg/L	0.2	<0.2
		Fenitrothion	µg/L	0.2	<0.2
		Malathion	µg/L	0.2	<0.2
		Methidathion	µg/L	0.5	<0.5
		Parathion-ethyl (Parathion)	µg/L	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	109
		d14-p-terphenyl (Surrogate)	%	-	96

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB324539.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(ah)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	78
		2-fluorobiphenyl (Surrogate)	%	-	80
		d14-p-terphenyl (Surrogate)	%	-	82

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result
LB324539.001	Arochlor 1016	µg/L	1	<1
	Arochlor 1221	µg/L	1	<1
	Arochlor 1232	µg/L	1	<1
	Arochlor 1242	µg/L	1	<1
	Arochlor 1248	µg/L	1	<1
	Arochlor 1254	µg/L	1	<1
	Arochlor 1260	µg/L	1	<1
	Arochlor 1262	µg/L	1	<1
	Arochlor 1268	µg/L	1	<1

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples (continued)

Method: ME-(AU)-[ENV]AN404

Sample Number	Parameter	Units	LOR	Result
LB324401.001	Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05
	Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01
	Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01
	Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01
	Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01
	Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01
	Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01
	Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01
	1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.01
	N-Methylperfluoroctane sulfonamide (N-MeFOSA)	µg/L	0.01	<0.01
	N-Ethylperfluoroctane sulfonamide (N-EtFOSA)	µg/L	0.01	<0.01
	N-Methylperfluorooctanesulfonamidoacetic acid (N_MeFOSAA)	µg/L	0.05	<0.05
	N-Ethylperfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	µg/L	0.05	<0.05
	2-(N-Methylperfluorooctane sulfonamido)-ethanol (N-MeFOSE)	µg/L	0.05	<0.05
	2-(N-Ethylperfluorooctane sulfonamido)-ethanol (N-EtFOSE)	µg/L	0.05	<0.05

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result
LB324300.001	Total Suspended Solids Dried at 103-105°C	mg/L	5	<5

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result
LB324547.001	Total Cyanide	mg/L	0.004	<0.004

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Sample Number	Parameter	Units	LOR	Result
LB324411.001	Total Dissolved Solids Dried at 175-185°C	mg/L	10	<10

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result
LB324838.001	Total Phenols	mg/L	0.05	<0.05
LB324838.027	Total Phenols	mg/L	0.05	<0.05

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Number	Parameter	Units	LOR	Result
LB324402.001	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	<0.02

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB324724.001	Aluminium	µg/L	5	<5
	Antimony	µg/L	1	<1
	Arsenic	µg/L	1	<1
	Barium	µg/L	1	<1
	Beryllium	µg/L	1	<1
	Boron	µg/L	5	<5
	Cadmium	µg/L	0.1	<0.1
	Chromium	µg/L	1	<1
	Cobalt	µg/L	1	<1
	Copper	µg/L	1	<1
	Iron	µg/L	5	<5
	Lead	µg/L	1	<1
	Manganese	µg/L	1	<1
	Molybdenum	µg/L	1	<1
	Nickel	µg/L	1	<1
	Selenium	µg/L	1	<1
	Silver	µg/L	1	<1
	Strontium	µg/L	1	<1
	Uranium	µg/L	1	<1
	Vanadium	µg/L	1	<1
	Zinc	µg/L	5	<5

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB324539.001	TRH C10-C14	µg/L	50	<50
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200
	TRH C37-C40	µg/L	200	<200

Turbidity

Method: ME-(AU)-[ENV]AN119

Sample Number	Parameter	Units	LOR	Result
LB324333.001	Turbidity	NTU	0.5	<0.5

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB324308.001	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5
		1,2-dichloropropane	µg/L	0.5	<0.5
		cis-1,3-dichloropropene	µg/L	0.5	<0.5
		trans-1,3-dichloropropene	µg/L	0.5	<0.5
		1,2-dibromoethane (EDB)	µg/L	0.5	<0.5
	Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5
		Chloromethane	µg/L	5	<5
		Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3
		Bromomethane	µg/L	10	<10
		Chloroethane	µg/L	5	<5
		Trichlorofluoromethane	µg/L	1	<1
		1,1-dichloroethene	µg/L	0.5	<0.5
		Iodomethane	µg/L	5	<5
		Dichloromethane (Methylene chloride)	µg/L	5	<5
		Allyl chloride	µg/L	2	<2
		trans-1,2-dichloroethene	µg/L	0.5	<0.5
		1,1-dichloroethane	µg/L	0.5	<0.5
		cis-1,2-dichloroethene	µg/L	0.5	<0.5
		Bromochloromethane	µg/L	0.5	<0.5
		1,2-dichloroethane	µg/L	0.5	<0.5
		1,1,1-trichloroethane	µg/L	0.5	<0.5
		1,1-dichloropropene	µg/L	0.5	<0.5
		Carbon tetrachloride	µg/L	0.5	<0.5
		Dibromomethane	µg/L	0.5	<0.5
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

VOCs in Water (continued)

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB324308.001	Halogenated Aliphatics	1,1,2-trichloroethane	µg/L	0.5	<0.5
		1,3-dichloropropane	µg/L	0.5	<0.5
		Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	<0.5
		1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5
		1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5
		1,2,3-trichloropropane	µg/L	0.5	<0.5
		trans-1,4-dichloro-2-butene	µg/L	1	<1
		1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5
		Hexachlorobutadiene	µg/L	0.5	<0.5
	Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5
		Bromobenzene	µg/L	0.5	<0.5
		2-chlorotoluene	µg/L	0.5	<0.5
		4-chlorotoluene	µg/L	0.5	<0.5
		1,3-dichlorobenzene	µg/L	0.5	<0.5
		1,4-dichlorobenzene	µg/L	0.3	<0.3
		1,2-dichlorobenzene	µg/L	0.5	<0.5
		1,2,4-trichlorobenzene	µg/L	0.5	<0.5
		1,2,3-trichlorobenzene	µg/L	0.5	<0.5
	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		Styrene (Vinyl benzene)	µg/L	0.5	<0.5
		o-xylene	µg/L	0.5	<0.5
		Isopropylbenzene (Cumene)	µg/L	0.5	<0.5
		n-propylbenzene	µg/L	0.5	<0.5
		1,3,5-trimethylbenzene	µg/L	0.5	<0.5
		tert-butylbenzene	µg/L	0.5	<0.5
		1,2,4-trimethylbenzene	µg/L	0.5	<0.5
		sec-butylbenzene	µg/L	0.5	<0.5
		p-isopropyltoluene	µg/L	0.5	<0.5
		n-butylbenzene	µg/L	0.5	<0.5
	Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5
	Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10
		MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
		Vinyl acetate*	µg/L	10	<10
		MEK (2-butanone)	µg/L	10	<10
		MIBK (4-methyl-2-pentanone)	µg/L	5	<5
		2-hexanone (MBK)	µg/L	5	<5
	Polycyclic VOCs	Naphthalene (VOC)*	µg/L	0.5	<0.5
	Sulphonated	Carbon disulfide	µg/L	2	<2
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	109
		Bromofluorobenzene (Surrogate)	%	-	75
	Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5
		Bromodichloromethane (THM)	µg/L	0.5	<0.5
		Dibromochloromethane (THM)	µg/L	0.5	<0.5
		Bromoform (THM)	µg/L	0.5	<0.5

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result
LB324308.001		TRH C6-C9	µg/L	40	<40
	Surrogates	d4-1,2-dichloroethane (Surrogate)	%	-	90
		d8-toluene (Surrogate)	%	-	109
		Bromofluorobenzene (Surrogate)	%	-	75

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Alkalinity

Method: ME-(AU)-[ENV]AN135

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271284.004	LB324677.013	Bicarbonate Alkalinity as CaCO3	mg/L	5	309.2622	305.1702	17	1
		Carbonate Alkalinity as CaCO3	mg/L	5	0	0	200	0
		Total Alkalinity as CaCO3	mg/L	5	309.2622	305.1702	17	1
SE271469.001	LB324677.024	Bicarbonate Alkalinity as CaCO3	mg/L	5	966.3909	960.4017	16	1
		Carbonate Alkalinity as CaCO3	mg/L	5	0	0	200	0
		Total Alkalinity as CaCO3	mg/L	5	966.3909	960.4017	16	1
SE271469.003	LB324677.029	Bicarbonate Alkalinity as CaCO3	mg/L	5	547.8258	534.1455	16	3
		Carbonate Alkalinity as CaCO3	mg/L	5	0	0	200	0
		Total Alkalinity as CaCO3	mg/L	5	547.8258	534.1455	16	3

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271270.001	LB324305.014	Ammonia Nitrogen, NH_3 as N	mg/L	0.01	12	12	15	2
SE271278.002	LB324305.023	Ammonia Nitrogen, NH_3 as N	mg/L	0.01	0.24	0.24	19	0

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271264.001	LB324383.023	Nitrate Nitrogen, NO3-N	mg/L	0.005	1.0	1.1	15	6
SE271266.001	LB324383.014	Sulfate, SO4	mg/L	1	118.45	114.43	16	3

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271284.008	LB324331.025	Conductivity @ 25 C	µS/cm	2	19940	19340	15	3

Dissolved Oxygen by Membrane Electrode

Method: ME-(AU)-[ENV]AN176

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271241.004	LB324259.004	Dissolved Oxygen**	mg/L	0.5	3.2	3.2	31	2

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271278.002	LB324305.023	Filterable Reactive Phosphorus as P	mg/L	0.005	0.13	0.13	19	1

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271284.004	LB324550.015	Total Organic Carbon as NPOC	mg/L	0.2	1.576	1.618	28	3
SE271332.001	LB324550.027	Total Organic Carbon as NPOC	mg/L	0.2	31.14	32.05	16	3

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271374.001	LB324853.014	Calcium, Ca	mg/L	0.2	64	66	15	2
		Magnesium, Mg	mg/L	0.1	6.9	6.9	16	1
SE271501.001	LB324853.016	Calcium, Ca	mg/L	0.2	16	16	16	0
		Magnesium, Mg	mg/L	0.1	2.5	2.5	19	2

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271270.001	LB324305.014	Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.36	0.36	16	0
SE271278.002	LB324305.023	Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.036	0.033	29	9

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

PAH (Polynuclear Aromatic Hydrocarbons) in Water (continued) — Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271241.003	LB324539.029		Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
			Fluorene	µg/L	0.1	<0.1	<0.1	200	0
			Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
			Anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Chrysene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.40	0.37	30	6
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.41	0.38	30	6
			d14-p-terphenyl (Surrogate)	µg/L	-	0.46	0.43	30	7
SE271374.001	LB324539.028		Naphthalene	µg/L	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthylene	µg/L	0.1	<0.1	<0.1	200	0
			Acenaphthene	µg/L	0.1	<0.1	<0.1	200	0
			Fluorene	µg/L	0.1	<0.1	<0.1	200	0
			Phenanthrene	µg/L	0.1	<0.1	<0.1	200	0
			Anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Chrysene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(b&j&k)fluoranthene	µg/L	0.2	<0.2	<0.2	200	0
			Benzo(a)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	µg/L	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	µg/L	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.39	0.39	30	0
			2-fluorobiphenyl (Surrogate)	µg/L	-	0.41	0.40	30	2
			d14-p-terphenyl (Surrogate)	µg/L	-	0.46	0.42	30	8

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples — Method: ME-(AU)-[ENV]AN404

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271262.010	LB324401.017	Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	200	0
		Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoropropane sulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples (continued)

Method: ME-(AU)-[ENV]AN404

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271262.010	LB324401.017	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorononane sulfonic acid (PFNS)	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	200	0
		1H,1H,2H,2H-Perfluorododecane sulfonic acid (10:2	µg/L	0.01	<0.01	<0.01	200	0
		Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	<0.01	<0.01	200	0
		N-Methylperfluoroctane sulfonamide (N-MeFOSA)	µg/L	0.01	<0.01	<0.01	200	0
		N-Ethylperfluoroctane sulfonamide (N-EtFOSA)	µg/L	0.01	<0.01	<0.01	200	0
		N-Methylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05	<0.05	200	0
		N-Ethylperfluorooctanesulfonamidoacetic acid	µg/L	0.05	<0.05	<0.05	200	0
		2-(N-Methylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05	<0.05	200	0
		2-(N-Ethylperfluorooctane sulfonamido)-ethanol	µg/L	0.05	<0.05	<0.05	200	0
		Sum of PFOS and PFHxS	µg/L	0.01	<0.01	<0.01	200	0
		Sum of enHealth PFAS (PFHxS+PFOS+PFOA)	µg/L	0.01	<0.01	<0.01	200	0
		Sum of US EPA PFAS (PFOS+PFOA)	µg/L	0.01	<0.01	<0.01	200	0
		Sum of PFAS A	µg/L	0.01	<0.01	<0.01	200	0
		Sum of PFAS B	µg/L	0.01	<0.01	<0.01	200	0
		Sum of PFAS C	µg/L	0.01	<0.01	<0.01	200	0
		Sum of Positive PFAS	µg/L	0.01	<0.01	<0.01	200	0
		(13C4-PFBA) Isotopically Labelled Internal Recovery	%	-	90	93	200	3
		(13C5-PFPeA) Isotopically Labelled Internal Recovery	%	-	101	100	200	1
		(13C5-PFHxA) Isotopically Labelled Internal Recovery	%	-	97	94	200	3
		(13C4-PFHpA) Isotopically Labelled Internal Recovery	%	-	92	94	200	3
		(13C4_PFOA) Isotopically Labelled Internal Recovery	%	-	91	92	200	0
		(13C9-PFNA) Isotopically Labelled Internal Recovery	%	-	99	100	200	1
		(13C6-PFDA) Isotopically Labelled Internal Recovery	%	-	83	82	200	1
		(13C7-PFUdA) Isotopically Labelled Internal Recovery	%	-	73	69	200	5
		(13C2-PFDoA) Isotopically Labelled Internal Recovery	%	-	59	55	200	6
		(13C2_PFTeDA) Isotopically Labelled Internal Recovery	%	-	63	62	200	2
		(13C3-PFBS) Isotopically Labelled Internal Recovery	%	-	97	95	200	2
		(13C3-PFHxS) Isotopically Labelled Internal Recovery	%	-	96	92	200	4
		(13C8-PFOS) Isotopically Labelled Internal Recovery	%	-	85	90	200	6
		(13C8-PFOSA) Isotopically Labelled Internal Recovery	%	-	89	86	200	4
		(D3-N-MeFOSAA) Isotopically Labelled Internal	%	-	65	62	200	5
		(D5-N-EtFOSAA) Isotopically Labelled Internal Recovery	%	-	76	70	200	9
		(13C2-4:2 FTS) Isotopically Labelled Internal Recovery	%	-	91	81	200	12
		(13C2-6:2 FTS) Isotopically Labelled Internal Recovery	%	-	104	95	200	9
		(13C2-8:2 FTS) Isotopically Labelled Internal Recovery	%	-	70	66	200	6
		(D7-N-MeFOSE) Isotopically Labelled Internal Recovery	%	-	62	56	200	11
		(D9-N-EtFOSE) Isotopically Labelled Internal Recovery	%	-	59	52	200	11
		(D3-N-MeFOSA) Isotopically Labelled Internal Recovery	%	-	57	53	200	6
		(D5-N-EtFOSA) Isotopically Labelled Internal Recovery	%	-	59	50	200	16

pH in water

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271283.005	LB324331.014	pH**	pH Units	0.1	7.8	7.8	16	0
SE271284.008	LB324331.025	pH**	pH Units	0.1	7.0	6.8	16	4

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN292

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271264.001	LB324402.014	Total Kjeldahl Nitrogen	mg/L	0.05	4.2	4.2	16	0

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

Total and Volatile Suspended Solids (TSS / VSS) (continued)

Method: ME-(AU)-[ENV]AN114

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271251.001	LB324300.019	Total Suspended Solids Dried at 103-105°C	mg/L	5	150	140	18	10
SE271283.001	LB324300.013	Total Suspended Solids Dried at 103-105°C	mg/L	5	150	140	18	7

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271204.001	LB324547.004	Total Cyanide	mg/L	0.004	<0.004	<0.004	200	0

Total Dissolved Solids (TDS) in water

Method: ME-(AU)-[ENV]AN113

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271211.001	LB324411.023	Total Dissolved Solids Dried at 175-185°C	mg/L	10	2500	2600	15	4
SE271284.001	LB324411.013	Total Dissolved Solids Dried at 175-185°C	mg/L	10	449.99999999	950.00000000	15	1

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271312.001	LB324838.014	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0
SE271511.001	LB324838.026	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0
SE271534.001	LB324838.031	Total Phenols	mg/L	0.05	<0.05	<0.05	200	0

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271264.001	LB324402.014	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	4.2	4.1	15	2
SE271284.008	LB324402.023	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	0.61	0.64	18	5

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271235.002	LB324724.014	Arsenic	µg/L	1	<1	<1	200	0
		Cadmium	µg/L	0.1	0.1	0.1	99	8
		Chromium	µg/L	1	1	1	101	0
		Copper	µg/L	1	<1	<1	194	0
		Lead	µg/L	1	<1	<1	145	0
		Nickel	µg/L	1	<1	<1	200	0
		Zinc	µg/L	5	190	190	18	2
SE271248.003	LB324724.024	Arsenic	µg/L	1	<1	<1	200	0
		Cadmium	µg/L	0.1	<0.1	<0.1	200	0
		Chromium	µg/L	1	<1	<1	149	0
		Copper	µg/L	1	60	61	17	2
		Lead	µg/L	1	<1	<1	200	0
		Nickel	µg/L	1	<1	<1	197	0
		Zinc	µg/L	5	<5	<5	200	0

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271241.003	LB324539.029		TRH C10-C14	µg/L	50	<50	<50	200	0
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	<60	<60	200	0
			TRH >C10-C16 - Naphthalene (F2)	µg/L	60	<60	<60	200	0
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0
SE271374.001	LB324539.028		TRH C10-C14	µg/L	50	56	<50	133	12
			TRH C15-C28	µg/L	200	<200	<200	200	0
			TRH C29-C36	µg/L	200	<200	<200	200	0
			TRH C37-C40	µg/L	200	<200	<200	200	0
			TRH C10-C40	µg/L	320	<320	<320	200	0
		TRH F Bands	TRH >C10-C16	µg/L	60	70	<60	130	16

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

TRH (Total Recoverable Hydrocarbons) in Water (continued) — Method: ME-(AU)-[ENV]AN403

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271374.001	LB324539.028	TRH F Bands	TRH >C10-C16 - Naphthalene (F2)	µg/L	60	70	<60	130	16
			TRH >C16-C34 (F3)	µg/L	500	<500	<500	200	0
			TRH >C34-C40 (F4)	µg/L	500	<500	<500	200	0

Turbidity — Method: ME-(AU)-[ENV]AN119

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271291.001	LB324333.010		Turbidity	NTU	0.5	6.2	6.3	23	1

VOCs in Water — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271241.005	LB324308.027	Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	2.7	2.8	48	3
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	11	30	5
			d8-toluene (Surrogate)	µg/L	-	8.7	10	30	19
			Bromofluorobenzene (Surrogate)	µg/L	-	8.1	9.4	30	15
		Totals	Total BTEX	µg/L	3	<3	<3	140	0
SE271293.002	LB324308.024	Fumigants	2,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			trans-1,3-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dibromoethane (EDB)	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated Aliphatics	Dichlorodifluoromethane (CFC-12)	µg/L	5	<5	<5	200	0
			Chloromethane	µg/L	5	<5	<5	200	0
			Vinyl chloride (Chloroethene)	µg/L	0.3	<0.3	<0.3	200	0
			Bromomethane	µg/L	10	<10	<10	200	0
			Chloroethane	µg/L	5	<5	<5	200	0
			Trichlorofluoromethane	µg/L	1	<1	<1	200	0
			1,1-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			Iodomethane	µg/L	5	<5	<5	200	0
			Dichloromethane (Methylene chloride)	µg/L	5	<5	<5	200	0
			Allyl chloride	µg/L	2	<2	<2	200	0
			trans-1,2-dichloroethene	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			cis-1,2-dichloroethene	µg/L	0.5	6.7	5.7	38	17
			Bromochloromethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2-dichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1,1-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1-dichloropropene	µg/L	0.5	<0.5	<0.5	200	0
			Carbon tetrachloride	µg/L	0.5	<0.5	<0.5	200	0
			Dibromomethane	µg/L	0.5	<0.5	<0.5	200	0
			Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	7.7	7.8	36	1
			1,1,2-trichloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Tetrachloroethene (Perchloroethylene,PCE)	µg/L	0.5	110	110	30	1
			1,1,1,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,1,2,2-tetrachloroethane	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichloropropane	µg/L	0.5	<0.5	<0.5	200	0
			trans-1,4-dichloro-2-butene	µg/L	1	<1	<1	200	0
			1,2-dibromo-3-chloropropane	µg/L	0.5	<0.5	<0.5	200	0
			Hexachlorobutadiene	µg/L	0.5	<0.5	<0.5	200	0
		Halogenated Aromatics	Chlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			Bromobenzene	µg/L	0.5	<0.5	<0.5	200	0
			2-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			4-chlorotoluene	µg/L	0.5	<0.5	<0.5	200	0
			1,3-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

NOTE: The RPD reported is calculated from the unrounded data for the original and replicate result. Manual calculation of the RPD from the rounded data reported may

VOCs in Water (continued) — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271293.002	LB324308.024	Halogenated Aromatics	1,4-dichlorobenzene	µg/L	0.3	<0.3	<0.3	200	0
			1,2-dichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,3-trichlorobenzene	µg/L	0.5	<0.5	<0.5	200	0
		Monocyclic Aromatic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
			Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			Styrene (Vinyl benzene)	µg/L	0.5	<0.5	<0.5	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
			Isopropylbenzene (Cumene)	µg/L	0.5	<0.5	<0.5	200	0
			n-propylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,3,5-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			tert-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			1,2,4-trimethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			sec-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			p-isopropyltoluene	µg/L	0.5	<0.5	<0.5	200	0
			n-butylbenzene	µg/L	0.5	<0.5	<0.5	200	0
		Nitrogenous Compounds	Acrylonitrile	µg/L	0.5	<0.5	<0.5	200	0
			2-nitropropane	µg/L	100	<100	<100	200	0
		Oxygenated Compounds	Acetone (2-propanone)	µg/L	10	<10	<10	200	0
			MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5	<0.5	200	0
			Vinyl acetate*	µg/L	10	<10	<10	200	0
			MEK (2-butanone)	µg/L	10	<10	<10	200	0
			MIBK (4-methyl-2-pentanone)	µg/L	5	<5	<5	200	0
			2-hexanone (MBK)	µg/L	5	<5	<5	200	0
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	<0.5	200	0
		Sulphonated	Carbon disulfide	µg/L	2	<2	<2	200	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	8.9	30	11
			d8-toluene (Surrogate)	µg/L	-	12	7.8	30	41 ②
			Bromofluorobenzene (Surrogate)	µg/L	-	7.4	7.5	30	1
		Totals	Total BTEX	µg/L	3	<3	<3	200	0
			Total VOC	µg/L	10	120	120	38	1
		Trihalomethanes	Chloroform (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromodichloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Dibromochloromethane (THM)	µg/L	0.5	<0.5	<0.5	200	0
			Bromoform (THM)	µg/L	0.5	<0.5	<0.5	200	0

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE271241.005	LB324308.027		TRH C6-C10	µg/L	50	<50	<50	195	0
			TRH C6-C9	µg/L	40	<40	<40	196	0
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	11	30	5
			d8-toluene (Surrogate)	µg/L	-	8.7	10	30	19
			Bromofluorobenzene (Surrogate)	µg/L	-	8.1	9.4	30	15
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	<50	200	0
SE271293.002	LB324308.024		TRH C6-C10	µg/L	50	150	150	63	6
			TRH C6-C9	µg/L	40	150	140	57	6
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	8.9	30	11
			d8-toluene (Surrogate)	µg/L	-	12	7.8	30	41 ②
			Bromofluorobenzene (Surrogate)	µg/L	-	7.4	7.5	30	1
		VPH F Bands	Benzene (F0)	µg/L	0.5	<0.5	<0.5	200	0
			TRH C6-C10 minus BTEX (F1)	µg/L	50	150	150	63	6

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324305.002	Ammonia Nitrogen, NH_3 as N	mg/L	0.01	2.6	2.5	80 - 120	104

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324383.002	Fluoride	mg/L	0.1	2.1	2	80 - 120	104
	Chloride	mg/L	0.05	18	20	80 - 120	91
	Bromide	mg/L	0.05	1.6	2	80 - 120	81
	Nitrate Nitrogen, NO3-N	mg/L	0.005	1.8	2	80 - 120	91
	Sulfate, SO4	mg/L	1	19	20	80 - 120	97

Conductivity and TDS by Calculation - Water

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324331.002	Conductivity @ 25 C	µS/cm	2	290	303	90 - 110	96

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324305.002	Filterable Reactive Phosphorus as P	mg/L	0.005	0.10	0.1	80 - 120	100

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324550.002	Total Organic Carbon as NPOC	mg/L	0.2	21	20	80 - 120	103

Full 8270 SVOC in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002	01-PAHs	Acenaphthene	µg/L	0.1	42	40	60 - 140	106
		Acenaphthylene	µg/L	0.1	43	40	60 - 140	107
		Anthracene	µg/L	0.1	42	40	60 - 140	105
		Benzo(a)pyrene	µg/L	0.1	49	40	60 - 140	122
		Fluoranthene	µg/L	0.1	38	40	60 - 140	96
		Naphthalene	µg/L	0.1	41	40	60 - 140	102
		Phenanthrene	µg/L	0.1	41	40	60 - 140	103
		Pyrene	µg/L	0.1	41	40	60 - 140	102
	02-OCs	Aldrin	µg/L	0.1	2.8	4	60 - 140	71
		Delta-BHC	µg/L	0.1	3.6	4	60 - 140	89
		p,p-DDT	µg/L	0.1	2.9	4	60 - 140	71
		Dieldrin	µg/L	0.1	3.5	4	60 - 140	88
		Endrin	µg/L	0.1	3.1	4	60 - 140	77
		Heptachlor	µg/L	0.1	2.8	4	60 - 140	70
	03-OPs	Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	8.9	8	60 - 140	111
		Diazinon (Dimpylate)	µg/L	0.5	10	8	60 - 140	127
		Dichlorvos	µg/L	0.5	9.6	8	60 - 140	120
		Ethion	µg/L	0.2	10	8	60 - 140	126
	05-SVCH (Cl	Hexachlorobenzene (HCB)	µg/L	0.1	4.1	4	60 - 140	103
	Benzenes,	Hexachlorobutadiene	µg/L	0.5	4.4	4	60 - 140	109
		Hexachloroethane	µg/L	0.5	4.2	4	60 - 140	104
		Pentachlorobenzene	µg/L	0.5	4.0	4	60 - 140	101
		1,2,3,4-tetrachlorobenzene	µg/L	0.5	4.0	4	60 - 140	99
	06-Phthalates	Bis(2-ethylhexyl)phthalate	µg/L	50	<50	8	60 - 140	95
		Butyl benzyl phthalate	µg/L	1	7	8	60 - 140	84
		Di-n-butyl phthalate	µg/L	10	<10	8	60 - 140	87
		Diethyl phthalate	µg/L	5	8	8	60 - 140	96
		Dimethyl phthalate	µg/L	1	6	8	60 - 140	81
		Di-n-octyl phthalate	µg/L	1	8	8	60 - 140	96
	09-Nitrosamine	N-nitroso-di-n-propylamine (NDPA)	µg/L	1	30	32	60 - 140	94
	10-Nitroaromat	Pentachloronitrobenzene (quintozene)	µg/L	1	5	4	60 - 140	126

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Full 8270 SVOC in Water (continued)

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002	14-Speciated	2,4-dichlorophenol	µg/L	0.5	48	40	60 - 140	121
	Routine	Phenol	µg/L	0.5	50	40	60 - 140	126
		2,4,6-trichlorophenol	µg/L	0.5	52	40	60 - 140	130
		Pentachlorophenol	µg/L	0.5	52	40	60 - 140	130
	Surrogates	d5-phenol (Surrogate)	µg/L	-	2.3	2	40 - 130	117
		d5-nitrobenzene (Surrogate)	µg/L	-	0.5	0.5	40 - 130	104
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.4	0.5	40 - 130	80
		2,4,6-Tribromophenol (Surrogate)	µg/L	-	5.6	5	40 - 130	111
		d14-p-terphenyl (Surrogate)	µg/L	-	0.5	0.5	40 - 130	94

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324853.002	Calcium, Ca	mg/L	0.2	44	50.5	80 - 120	88
	Lithium, Li	mg/L	0.005	0.10	0.1	80 - 120	102
	Magnesium, Mg	mg/L	0.1	44	50.5	80 - 120	88
	Potassium, K	mg/L	0.1	45	55	80 - 120	81
	Silicon, Si*	mg/L	0.05	0.22	0.25	80 - 120	89
	Sodium, Na	mg/L	0.5	43	50.5	80 - 120	85

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324305.002	Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.10	0.1	80 - 120	101

OC Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002		Delta BHC	µg/L	0.1	0.2	0.2	60 - 140	95
		Heptachlor	µg/L	0.1	0.2	0.2	60 - 140	94
		Aldrin	µg/L	0.1	0.2	0.2	60 - 140	95
		Dieldrin	µg/L	0.1	0.2	0.2	60 - 140	96
		Endrin	µg/L	0.1	0.2	0.2	60 - 140	95
		p,p'-DDT	µg/L	0.1	0.2	0.2	60 - 140	91
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	µg/L	-	0.13	0.15	40 - 130	87

OP Pesticides in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002		Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	6.8	8	60 - 140	85
		Diazinon (Dimpylate)	µg/L	0.5	7.5	8	60 - 140	93
		Dichlorvos	µg/L	0.5	5.5	8	60 - 140	69
		Ethion	µg/L	0.2	7.0	8	60 - 140	88
	Surrogates	2-fluorobiphenyl (Surrogate)	µg/L	-	0.41	0.5	40 - 130	82
		d14-p-terphenyl (Surrogate)	µg/L	-	0.39	0.5	40 - 130	78

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002		Naphthalene	µg/L	0.1	33	40	60 - 140	82
		Acenaphthylene	µg/L	0.1	35	40	60 - 140	86
		Acenaphthene	µg/L	0.1	34	40	60 - 140	86
		Phenanthrene	µg/L	0.1	32	40	60 - 140	79
		Anthracene	µg/L	0.1	36	40	60 - 140	91
		Fluoranthene	µg/L	0.1	32	40	60 - 140	79
		Pyrene	µg/L	0.1	31	40	60 - 140	78
		Benzo(a)pyrene	µg/L	0.1	33	40	60 - 140	82
	Surrogates	d5-nitrobenzene (Surrogate)	µg/L	-	0.39	0.5	40 - 130	78
		2-fluorobiphenyl (Surrogate)	µg/L	-	0.41	0.5	40 - 130	82
		d14-p-terphenyl (Surrogate)	µg/L	-	0.39	0.5	40 - 130	78

PCBs in Water

Method: ME-(AU)-[ENV]AN420

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002	Arochlor 1260	µg/L	1	<1	0.4	60 - 140	95

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous Samples

Method: ME-(AU)-[ENV]AN404

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324401.002	Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.18	0.2	40 - 160	89
	Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.21	0.2	40 - 160	104
	Perfluorononanoic acid (PFNA)	µg/L	0.01	0.24	0.2	40 - 160	118
	Perfluorodecanoic acid (PFDA)	µg/L	0.01	0.20	0.2	40 - 160	101
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	0.19	0.2	40 - 160	96
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	0.22	0.2	40 - 160	112
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.18	0.2	40 - 160	91
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.01	0.22	0.2	40 - 160	112

pH in water

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324331.003	pH**	pH Units	0.1	7.4	7.415	98 - 102	100

Redox Potential (Eh) in water

Method: ME-(AU)-[ENV]AN240

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324332.001	Eh of Sample Relative to Standard H+ Electrode***	mV	-500	431	428	90 - 110	101

Total and Volatile Suspended Solids (TSS / VSS)

Method: ME-(AU)-[ENV]AN114

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324300.002	Total Suspended Solids Dried at 103-105°C	mg/L	5	100	100	80 - 120	103

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324547.002	Total Cyanide	mg/L	0.004	0.026	0.025	80 - 120	103

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324838.002	Total Phenols	mg/L	0.05	0.19	0.2	80 - 120	95
LB324838.029	Total Phenols	mg/L	0.05	0.19	0.2	80 - 120	95

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324402.002	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	1.1	1	80 - 120	108

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324724.002	Aluminium	µg/L	5	20	20	80 - 120	99
	Antimony	µg/L	1	20	20	80 - 120	100
	Arsenic	µg/L	1	20	20	80 - 120	98
	Barium	µg/L	1	21	20	80 - 120	106
	Beryllium	µg/L	1	20	20	80 - 120	102
	Boron	µg/L	5	20	20	80 - 120	99
	Cadmium	µg/L	0.1	20	20	80 - 120	101
	Chromium	µg/L	1	21	20	80 - 120	103
	Cobalt	µg/L	1	21	20	80 - 120	105
	Copper	µg/L	1	20	20	80 - 120	102
	Iron	µg/L	5	21	20	80 - 120	104
	Lead	µg/L	1	20	20	80 - 120	102
	Manganese	µg/L	1	22	20	80 - 120	111
	Molybdenum	µg/L	1	21	20	80 - 120	104
	Nickel	µg/L	1	20	20	80 - 120	100
	Selenium	µg/L	1	19	20	80 - 120	93
	Silver	µg/L	1	18	20	80 - 120	88

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Trace Metals (Dissolved) in Water by ICPMS (continued)

Method: ME-(AU)-[ENV]AN318

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324724.002		Strontium	µg/L	1	20	20	80 - 120	101
		Uranium	µg/L	1	20	20	80 - 120	99
		Vanadium	µg/L	1	20	20	80 - 120	98
		Zinc	µg/L	5	23	20	80 - 120	113

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324539.002		TRH C10-C14	µg/L	50	1200	1200	60 - 140	97
		TRH C15-C28	µg/L	200	1300	1200	60 - 140	109
		TRH C29-C36	µg/L	200	1200	1200	60 - 140	100
	TRH F Bands	TRH >C10-C16	µg/L	60	1300	1200	60 - 140	107
		TRH >C16-C34 (F3)	µg/L	500	1300	1200	60 - 140	105
		TRH >C34-C40 (F4)	µg/L	500	590	600	60 - 140	98

VOCs in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324308.002	Halogenated	1,1-dichloroethene	µg/L	0.5	41	45.45	60 - 140	91
	Aliphatics	1,2-dichloroethane	µg/L	0.5	50	45.45	60 - 140	110
		Trichloroethene (Trichloroethylene,TCE)	µg/L	0.5	48	45.45	60 - 140	106
	Halogenated	Chlorobenzene	µg/L	0.5	56	45.45	60 - 140	123
	Monocyclic	Benzene	µg/L	0.5	58	45.45	60 - 140	129
	Aromatic	Toluene	µg/L	0.5	57	45.45	60 - 140	126
		Ethylbenzene	µg/L	0.5	50	45.45	60 - 140	110
		m/p-xylene	µg/L	1	97	90.9	60 - 140	107
		o-xylene	µg/L	0.5	49	45.45	60 - 140	107
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	9.5	10	70 - 130	95
		Bromofluorobenzene (Surrogate)	µg/L	-	11	10	70 - 130	114
	Trihalomethan	Chloroform (THM)	µg/L	0.5	49	45.45	60 - 140	108

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB324308.002		TRH C6-C10	µg/L	50	770	946.63	60 - 140	81
		TRH C6-C9	µg/L	40	670	818.71	60 - 140	81
	Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	10	10	60 - 140	103
		d8-toluene (Surrogate)	µg/L	-	9.5	10	70 - 130	95
		Bromofluorobenzene (Surrogate)	µg/L	-	11	10	70 - 130	114
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	450	639.67	60 - 140	71

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Ammonia Nitrogen by Discrete Analyser

Method: ME-(AU)-[ENV]AN291

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324305.004	Ammonia Nitrogen, NH_3 as N	mg/L	0.01	2.6	0.02	2.5	105

Anions by Ion Chromatography in Water

Method: ME-(AU)-[ENV]AN245

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324383.024	Nitrate Nitrogen, NO3-N	mg/L	0.005	2.2	0.20	2	102

Filterable Reactive Phosphorus (FRP)

Method: ME-(AU)-[ENV]AN278

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324305.004	Filterable Reactive Phosphorus as P	mg/L	0.005	0.090	<0.005	0.1	90

Forms of Carbon

Method: ME-(AU)-[ENV]AN190

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324550.005	Total Organic Carbon as NPOC	mg/L	0.2	57	2.5	50	109

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311(Perth)/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271221.001	LB324373.004	Mercury	mg/L	0.0001	0.0019	<0.0001	0.008	99

Metals in Water (Dissolved) by ICPOES

Method: ME-(AU)-[ENV]AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271211.001	LB324853.004	Calcium, Ca	mg/L	0.2	320	270	50.5	97

Nitrite in Water

Method: ME-(AU)-[ENV]AN277

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324305.004	Nitrite Nitrogen, NO2 as N	mg/L	0.005	0.17	0.070	0.1	98

TKN Kjeldahl Digestion by Discrete Analyser

Method: ME-(AU)-[ENV]AN292

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324402.024	Total Kjeldahl Nitrogen	mg/L	0.05	3.2	0.43	2.5	110

Total Cyanide in water by Discrete Analyser

Method: ME-(AU)-[ENV]AN077/AN287

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271330.001	LB324547.015	Total Cyanide	mg/L	0.004	0.030	<0.004	0.025	112

Total Phenolics in Water

Method: ME-(AU)-[ENV]AN295

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.001	LB324838.004	Total Phenols	mg/L	0.05	0.18	<0.05	0.2	92
SE271519.001	LB324838.028	Total Phenols	mg/L	0.05	0.18	0.0001	0.2	92

Total Phosphorus by Kjeldahl Digestion DA in Water

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

QC Sample	Sample Number	Parameter	Units	LOR

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Phosphorus by Kjeldahl Digestion DA in Water (continued)

Method: ME-(AU)-[ENV]AN279/AN293(Sydney only)

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE271241.004	LB324402.024	Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	1.2	0.18	1	102

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE270475.001	LB324724.004	Arsenic	µg/L	1	20	<1	20	98
		Cadmium	µg/L	0.1	20	<0.1	20	100
		Chromium	µg/L	1	20	<1	20	101
		Copper	µg/L	1	20	<1	20	100
		Iron	µg/L	5	120	110	20	65 ⑤
		Lead	µg/L	1	20	<1	20	99
		Manganese	µg/L	1	26	4	20	108
		Nickel	µg/L	1	20	<1	20	98
		Zinc	µg/L	5	29	6	20	116

VOCs in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE271293.001	LB324308.025	Monocyclic	Benzene	µg/L	0.5	<0.5	45.45	134
		Aromatic	Toluene	µg/L	0.5	<0.5	45.45	135
			Ethylbenzene	µg/L	0.5	<0.5	45.45	112
			m/p-xylene	µg/L	1	<1	90.9	108
			o-xylene	µg/L	0.5	<0.5	45.45	110
		Polycyclic	Naphthalene (VOC)*	µg/L	0.5	<0.5	-	-
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.6	-	103
			d8-toluene (Surrogate)	µg/L	-	9.3	-	117
			Bromofluorobenzene (Surrogate)	µg/L	-	7.9	-	95
		Totals	Total BTEX	µg/L	3	<3	-	-

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE271293.001	LB324308.025		TRH C6-C10	µg/L	50	<50	946.63	85
			TRH C6-C9	µg/L	40	<40	818.71	97
		Surrogates	d4-1,2-dichloroethane (Surrogate)	µg/L	-	9.6	-	103
			d8-toluene (Surrogate)	µg/L	-	9.3	-	117
			Bromofluorobenzene (Surrogate)	µg/L	-	7.9	-	95
		VPH F	Benzene (F0)	µg/L	0.5	<0.5	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	µg/L	50	<50	639.67	75

MATRIX SPIKE DUPLICATES

SE271241 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: https://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
***	Indicates that both * and ** apply.
-	Sample not analysed for this analyte.
IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.
①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to relevant report comments for further information.

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Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 362181

Client Details

Client	EI Australia
Attention	Linda Sweeney
Address	Suite 6.01, 55 Miller Street, Pyrmont, NSW, 2009

Sample Details

Your Reference	**E26484, 300 Burns Bay Road, Lane Cove**
Number of Samples	1 Water
Date samples received	19/09/2024
Date completed instructions received	19/09/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	26/09/2024
Date of Issue	24/09/2024

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Results Approved By
Dragana Tomas, Senior Chemist
Loren Bardwell, Development Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water		
Our Reference		362181-1
Your Reference	UNITS	GQT1
Date Sampled		18/09/2024
Type of sample		Water
Date extracted	-	20/09/2024
Date analysed	-	23/09/2024
TRH C_6 - C_9	µg/L	35
TRH C_6 - C_{10}	µg/L	38
TRH C_6 - C_{10} less BTEX (F1)	µg/L	34
Benzene	µg/L	<1
Toluene	µg/L	3
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	98
Surrogate Toluene-d8	%	95
Surrogate 4-Bromofluorobenzene	%	81

svTRH (C10-C40) in Water		
Our Reference		362181-1
Your Reference	UNITS	GQT1
Date Sampled		18/09/2024
Type of sample		Water
Date extracted	-	20/09/2024
Date analysed	-	21/09/2024
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
Total +ve TRH (C10-C36)	µg/L	<50
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Total +ve TRH (>C10-C40)	µg/L	<50
Surrogate o-Terphenyl	%	73

HM in water - dissolved		
Our Reference		362181-1
Your Reference	UNITS	GQT1
Date Sampled		18/09/2024
Type of sample		Water
Date prepared	-	20/09/2024
Date analysed	-	20/09/2024
Arsenic-Dissolved	µg/L	1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	2
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	5
Zinc-Dissolved	µg/L	22

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determined stoichiometrically from the base metal concentration.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			20/09/2024	1	20/09/2024	23/09/2024		20/09/2024	[NT]
Date analysed	-			23/09/2024	1	23/09/2024	23/09/2024		23/09/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	35	32	9	101	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	38	36	5	101	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
Toluene	µg/L	1	Org-023	<1	1	3	3	0	101	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	101	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	101	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	102	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	100	1	98	101	3	99	[NT]
Surrogate Toluene-d8	%		Org-023	97	1	95	101	6	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	88	1	81	87	7	100	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			20/09/2024	[NT]	[NT]	[NT]	[NT]	20/09/2024	[NT]
Date analysed	-			21/09/2024	[NT]	[NT]	[NT]	[NT]	21/09/2024	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	97	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	70	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date prepared	-			20/09/2024	[NT]	[NT]	[NT]	[NT]	20/09/2024	[NT]
Date analysed	-			20/09/2024	[NT]	[NT]	[NT]	[NT]	20/09/2024	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	102	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

362181 COC 18/9/24 17:00

Sheet 1 of 1

Site: 300 Burns Bay Road, Lane Cove

Project No: E26484

Laboratory: **Envirolab Services**
12 Ashley Street,
CHATSWOOD NSW 2067
P: 02 9910 6200

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	SOIL	WATER	0.45 µm field filtered	OTHER	HM A /TRH/BTEX/PAHs OCP/OP/PCB/Asbestos	HM A /TRH/BTEX/PAHs	HM A /TRH/BTEX	BTEX	VOCs	Asbestos	Asbestos Quantification	Excavated Natural Material (ENM) Suite	Dewatering Suite	pH / pH peroxide	sPOCAS	Chromium Reducible Sulfur (CrS)	PFAS	pH / CEC (cation exchange)	pH / EC (electrical conductivity)	Sulphate / Chloride	HOLD		TCLP HM B / PAH
GQT1	1	S, P, VC	18/09/2024	am/pm		X	X				X																

Comments

HM A
Arsenic
Cadmium
Chromium
Copper
Lead
Mercury
Nickel
Zinc

HM B
Arsenic
Cadmium
Chromium
Lead
Mercury
Nickel

Dewatering Suite
pH & EC
TDS / TDU
Hardness
Total Cyanide
Metals (Al, As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
TRH (F1, F2, F3, F4)
BTEX
PAH
Total Phenol

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other_____

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [ ]

Sampler's Name (EI):		Received by (Envirolab):
Print	Linda Sweeney	*Print*
Signature	LSweeney	*Signature*
Date	18/09/2024	*Date*

Sampler's Comments:
Please cc in Andrew Schmidt

eiaustralia
Contamination | Remediation | Geotechnical

Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

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IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

Sheet 1 of 1

Site: 300 Burns Bay Road, Lane Cove

Project No: E26484

Laboratory: SGS Australia
Unit 16, 33 Maddox Street,
ALEXANDRIA NSW 2015
P: 02 8594 0400 F: 02 8594 0499

Sample ID	Laboratory ID	Container Type	Sampling Date	Sampling Time	SOIL	WATER	0.45 µm field filtered	OTHER	pH / EC (electrical conductivity)	Alkalinity (bicarbonate, hydroxide and total	Major Anions	Major Cations	Ionic balance	Nutrients	Feacal coliforms	Faecal Streptococci	Escherichia Coli	Redox / TDS / Hardness / Temperature	HM / DO	Physical Parameters	BTEX / TRHs	PFAS	OCPs / OPPs / PCBs	SVOCs	VOCs / PAHS	Al, As, Cd, Cr, Cu, Pb, Hg, Ni & Zn	Total Phenols	Cyanide	BTEX	Cyanide, Turbidity TDS, Hardness
BH1M		S,P, VC	18/04/2024	am/pm		X	X		X												X				X	X	X			X
BH2M		S,P, VC	18/04/2024	am/pm		X	X		X												X				X	X	X			X
BH5M		S,P, VC	18/04/2024	am/pm		X	X		X												X				X	X	X			X
BH3M		S,P, VC	18/04/2024	am/pm		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X		
GW-QD1		S,P, VC	18/04/2024	am/pm		X	X														X					X				
GW-QRB1		S,P, VC	18/04/2024	am/pm		X															X					X				
GW-QFB1		S,P, VC	18/04/2024	am/pm		X																								
GW-QTS1		VC	Lab Prepared			X																							X	
GW-QTB1		VC	Lab Prepared			X																							X	

Sample Matrix

Analysis

Comments

Major Anions
Sulfate (SO_4)
Chloride (Cl)
Carbonates (CO_4)
Bromide (Br)
Fluoride (F)
Major Cations
Calcium (Ca)
Magnesium (Mg)
Sodium (Na)
Potassium (K)
Ionic balance
Cation/anion balance (as percentage)
Nutrients
Ammonia (NH_3)
Nitrate
Total Nitrogen
Oxidised Ntrogen
Total Phosphorus
Reactive Phosphorus
HM
Metals (Al, Sb, As, Ba, Be, B, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Hg, Mo, Ni, Se, dissolved SiO^2, Ag, Sr, U, V, Zn)
Physical Parameters
Turbidity, Total suspendd Solids, Total Organic Carbon, Sodium absorption Ratio

LABORATORY TURNAROUND

- [X] Standard
- [ ] 24 Hours
- [ ] 48 Hours
- [ ] 72 Hours
- [ ] Other

Container Type:
J = solvent washed, acid rinsed, Tefton sealed glass jar
S = solvent washed, acid rinsed glass bottle
P = natural HDPE plastic bottle
VC = glass vial, Tefton Septum
ZLB = Zip-Lock Bag BB = Bulk Bag

Investigator: I attest that these samples were collected in accordance with standard EI field sampling procedures.

Report with EI Waste Classification Table [ ]

Sampler's Name (EI):	Received by (SGS):
Print: Linda Sweeney	Print:
Signature: L Sweeney	Signature:
Date: 18/09/2024	Date:

Sampler's Comments:
Please fwd GW-QT1 to Envirolab with ice
cc: Andrew.Schmidt (1)

eiaustralia
Contamination | Remediation | Geotechnical
Suite 6.01, 55 Miller Street,
PYRMONT NSW 2009
Ph: 9516 0722
lab@eiaustralia.com.au

COC June 2021 FORM v.5 - SGS

IMPORTANT:
Please e-mail laboratory results to: lab@eiaustralia.com.au

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 362181
Date Received: 19/9/24
Time Received: 13hrs
Received By: [illegible]
Temp: Cool/Ambient 8°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

ASC # 10489
19/9/24

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	EI Australia
Attention	Linda Sweeney

Sample Login Details

Your reference	E26484, 300 Burns Bay Road, Lane Cove
Envirolab Reference	362181
Date Sample Received	19/09/2024
Date Instructions Received	19/09/2024
Date Results Expected to be Reported	26/09/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	3
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	HM in water - dissolved
GQT1	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info
Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Appendix H – QA/QC Assessment

Quality Assurance / Quality Control Program

Quality assurance comprises an assessment of the reliability of the field procedures and laboratory results, in accordance with the SAQP. The QA/QC measures incorporated into the GME completed for this report are presented in **Table H-1**.

Table H-1 GME QA/QC Measures

Task	Description	Comments
Field QA/QC		
General	Work was to be undertaken following standard field procedures which are based on industry accepted standard practice.	Groundwater samples were obtained using sample bottles/vials provided by the laboratory.
	All fieldwork was supervised by a suitably qualified and experienced scientist or engineer.	Yes
Soil Screening with PID	The PID was serviced and calibrated as per manufacturer requirements. PID calibrated at the beginning of each day of fieldwork.	Yes
Equipment Decontamination	Sampling equipment to be decontaminated after the collection of each soil sample by washing with phosphate-free detergent and potable water, followed by a final distilled water rinse. One rinsate blank would be collected and analysed for the primary contaminants. All results should be non-detect.	One rinsate sample was collected during the groundwater investigation on 18 September 2024. All concentrations were reported as below the detection limits.
Transport	Samples stored in a chilled cooler box and transported to the laboratories. To ensure the integrity of the samples from collection to receipt by the analytical laboratory, samples were sent by courier to the laboratories under 'chain of custody' describing sample preservation and transport duration.	Yes
Trip Blanks	Trip blank samples were to be prepared and analysed by the primary laboratory for BTEX. Analytical results to be below the laboratory LOR, indicating satisfactory sample transport and handling conditions were achieved.	One trip spike samples were collected during the investigation. All concentrations were reported as below the detection limits.
Trip Spikes	Trip spike samples were to be prepared and analysed by the primary laboratory for BTEX. Analytical results to be within 80-120% recovery, indicating satisfactory sample transport and handling conditions were achieved.	One trip spike samples were collected during the investigation. All concentrations were reported as below the detection limits.

Task	Description	Comments
Duplicates	Field duplicate samples were to be analysed as follows (as per NEPM): ▪ intra-laboratory duplicates at a rate of 1 in 20 primary samples; and ▪ inter-laboratory duplicates at a rate of 1 in 20 primary samples. Field and laboratory acceptable limits between 30-50% RPD as stated by AS4482.1–2005. RPDs that exceed this range may be considered acceptable where: ▪ Results are less than 10 times the limits of reporting (LOR); ▪ Results are less than 20 times the LOR and the RPD is less than 50%; or ▪ Heterogeneous materials or volatile compounds are encountered. Non-compliance is to be documented in the report and the sample re-analysed or a higher level conservatively adopted.	The required sampling density of 1 per 20 duplicated primary samples was achieved and sufficient for the investigation. Laboratory duplicates prepared and analysed. Minor non-conformance, with negligible effects on data use for interpretative purposes. Non-conformance was reported for metal (copper) and TRH (F1) concentrations for groundwater duplicates. This is likely due to the heterogeneous nature of groundwater. Field QC samples and calculated RPD values are presented the table at the end of this appendice. Copies of laboratory reports are included in **Appendix G**.
<u>Laboratory QA/QC</u>		
Laboratory Analysis	The laboratories selected are NATA accredited for the analytes selected and perform their own internal QA/QC programs.	Yes SGS - primary laboratory Envirolab - secondary laboratory Laboratory QA/QC analyses are included in **Appendix G.**
	Appropriate detection limits were used for the analyses to be undertaken.	Practical Quantitation Limits for all tested parameters during the investigation are presented in laboratory analytical reports in **Appendix G.**
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.	Laboratory sample extraction and analysis dates were outside the suggested criteria for nitrite, E. coli and Thermotolerant coliforms and Enterococci in Water.
Method Blanks	The method blank contains the reagents used to prepare the sample for analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis. The DQI is no detectable contamination.	Yes
Laboratory Duplicates	Laboratory duplicates are field samples from a given batch, selected at random (a frequency of 1 per 10 samples), that are analysed a number of times, to assess the precision of the analytical method.	Assessment of laboratory duplicates has been undertaken by the laboratory. All laboratory duplicates were within acceptable ranges, with the exception of the following: Sample SE271241 R0 (2,4,6 - Tribromophenol (Surrogate) with 33% recovery) RPD failed acceptance criteria due to sample heterogeneity.

Task	Description	Comments
Laboratory Control Standard	A laboratory control standard is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples should be performed on a frequency of 1 per 20 samples or at least one per analytical run.	Assessment of laboratory control standard has been undertaken by the laboratory. All laboratory control standards were within acceptable ranges.
Matrix Spikes	Matric spikes are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated laboratory control limits of 70 to 130% and duplicates should have RPDs of less than 50%.	Assessment of matrix spikes has been undertaken by the laboratory. All laboratory control standards were within acceptable ranges, with the exception of the following: Sample SE270475.001 (Iron with 65% recovery) recovery failed acceptance criteria due to matrix interference.
Surrogate Spikes	Surrogate spikes provide a means of checking, for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits of 70 to 130%.	Assessment of surrogate spikes has been undertaken by the laboratory. All data quality objectives were met.
Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have no significant effect on the quality of the data.	Assessment of the investigation QA/QC is presented in the following sections.

Field QA/QC

Field QC Samples

The field (intra- / inter- laboratory) duplicates collected during the GME are identified in **Table H-2**. Inter-laboratory duplicates were analysed by the secondary laboratory, Envirolab.

Table H-2 Field QC Duplicates

Matrix	Primary Sample	Duplicate (Primary Lab)	Triplicate (Secondary Lab)	Total Duplicates
Groundwater	BH1M	GQD1	GWQT1	2

Field QC Summary

All field work, including equipment decontamination and sample preservation and transport, was conducted in general accordance with the SAQP, which were devised with reference to industry-approved guidelines. Appropriate QC measures were integrated into each sampling event and the DQIs were met.

All samples, including field QC samples, were transported to the primary and secondary laboratories under refrigerated conditions, using strict COC procedures. Relevant documents (COC forms) were presented with the samples at the times of delivery. All supporting documents (COCs and SRAs) were completed in full and signed, where appropriate. EI considered the field QA/QC program carried out during the GME to be appropriate.

Refer to **Tables H-1** and **H-3** for the details of specific field QA/QC measures.

Table H-3 Field QA/QC Program

QA Component	Item	Conformance
Precision Measure of the variability (or reproducibility) of data	SOPs appropriate and complied with	Yes
Accuracy Quantitative measure of the closeness of reported data to the true values	SOPs appropriate and complied with	Yes
	Calibration of instruments against known standards	Yes
Representativeness Confidence the data are representative of each media present on the site	Appropriate media sampled according to SAQP	Yes
	Each media identified in SAQP sampled	Yes
Completeness Percentage of useable data from sampling episode (set)	Each critical location sampled	Yes
	SAQP appropriate and complied with	Yes
	Appropriate number of field duplicate samples taken	Yes
	Experienced sampler	Yes
	Field documentation correct	Yes
Comparability Confidence that data are equivalent for each sampling and analytical event	Same sampling method used on each occasion	Yes
	Experienced sampler	Yes
	Same type of samples collected (filtered, size)	Yes

Laboratory QA/QC

Laboratory Accreditation

Primary and intra-laboratory duplicate samples were analysed by SGS (located in Alexandria NSW), with inter-laboratory duplicate samples analysed by Envirolab (located in Chatswood NSW). All laboratories are accredited by NATA for the analyses undertaken.

Laboratory QC Summary

All contracted laboratories (SGS and Envirolab) were accredited by NATA for the analyses undertaken. All analytical procedures used were industry recognised and endorsed standard methods. Appropriate QC measures were integrated into each testing batch and the DQIs were met, or if not, the variability was suitably justified.

All final reports were submitted in full and included all requested analyses, as per the signed COC forms. EI considered the laboratory QA/QC programs carried out during the GME to be appropriate.

Refer to **Tables H-1** and **H-4** for the details of specific laboratory QA/QC measures.

Table H-4 Laboratory QA/QC Program

QA Component	Item	Conformance
Precision Measure of the variability (or reproducibility) of data	Analysis of laboratory duplicates	Yes
	Analysis of field duplicates	Yes
	Analysis of laboratory-prepared volatile trip spikes	Yes
Accuracy Quantitative measure of the closeness of reported data to the true values	Analysis of field blanks	Yes
	Analysis of rinsate/ rinsate blanks	Yes
	Analysis of method blanks	Yes
	Analysis of matrix spikes	Yes
	Analysis of surrogate spikes	Yes
	Analysis of laboratory control samples	Yes
Representativeness Confidence the data are representative of each media present on the site	All samples analysed according to SAQP in the proposal	Yes
	All samples analysed according to CoC	Yes
Completeness Percentage of useable data from sampling episode (set)	All critical samples analysed according to SAQP and proposal	Yes
	All analytes analysed according to SAQP in proposal	Yes
	Appropriate methods and PQLs	Yes
	Sample documentation complete	Yes
	Sample holding times complied with	Part
Comparability Confidence that data are equivalent for each sampling and analytical event	Sample analytical methods used (including clean-up)	Yes
	Sample PQLs (justify/ quantify if different)	Yes
	Same laboratories (justify/ quantify if different)	Yes
	Same units (justify/ quantify if different)	Yes

Concluding Remarks for the GME QA/QC Assessment

The sampling (including sample preservation, transport and decontamination procedures) and laboratory methods followed during the GME were consistent with EI protocols. The project DQOs specified in **Section 3.4.1** were considered to have been achieved. The adopted QA/QC program ensured that the data collated during the GME were accurate, precise and representative of the site condition. It was therefore considered that the data were reliable and that the results could be used for DMP interpretative purposes.

Appendix I – DCR and Works Surrender Form

Clear form Print

Completion report for dewatering work

Providing a completion report is a condition of the approval and a copy of the completed form **must** be supplied **when or before you surrender the approval** to finalise the dewatering activity. You cannot surrender the approval without it.

All the information to be supplied is specified within this form.

To complete the form, you will be required to gather data at the commencement of works and during the dewatering activity.

What you need to do

Use this form to record and report groundwater taken by aquifer interference activities.[1]

Section A to E:

These sections require information on the following:
Approval held, dewatering duration/groundwater source, details of person taking water, activity description and location.

Section F to I:

For these sections you will be required to gather data at the commencement of works and during the dewatering activity.

Information to enter includes:
Summary of total water taken, record of metered volumes taken, summary of water level measurements from monitoring bores and water testing undertaken.

Note:

- Information must be supplied in accordance with approval held, refer to approval.
- To measure volumes, a meter must be used[7].
- Excel soft copies of measurement data may also be required. Please ensure these are provided in accordance with the instructions shown in that section.

Section J:

Complete form declaration.

Refer to the end of the form for information on:

- Returning completed forms and any attachments
- Where to get help
- Privacy statement
- Notes section

Section A: Approval held

Report submission date	
Dewatering approval number	
Approval expiry date	

Section B: Dewatering duration / groundwater source

Dewatering duration	Days/Weeks/Months/Years
Dewatering start date	
Dewatering end date	
Groundwater source[2]	

Section C: Details of person taking water[3]

Full name		
Company/organisation (including ACN/ABN)		
Postal address		
Suburb	State	Postcode
Phone		
Email		

Section D: Activity description

Project name	
Describe the activity/s resulting in groundwater being taken[4]	
Describe the means by which the groundwater is being taken[5]	
Is your dewatering activity exempt from obtaining a water access licence under the Water Management (General) Regulation 2018	☐ Yes ☐ No
If no, please provide your water access licence number	

Section E: Activity location

Address		
Suburb	State	Postcode

or

Lot / Deposited Plan / Section

or

GPS coordinates[6] *(for example, 32.25316 S 148.60022 E)*

Section F: Summary of total water taken

Provide the below in accordance to approval held. **Important:** a meter must be used to measure volumes[7].

1. Duration of dewatering (pumping)[8] either a) or b):		
a) ☐ for water year	1 July	**to** 30 June
b) ☐ during dewatering period	From	**to**

2. Total volume pumped in either **a)**, **b)** or **c)** units[9]		
a) ☐ in Litres		L
b) ☐ in Kilolitres		kL
c) ☐ in Megalitres		ML

Section G: Record of metered volumes taken

Complete this section to record **metered** volumes taken. Either **daily** or **weekly** readings are required.

Refer to the conditions of your approval and the exemption (if applicable) to determine the reading frequency you need to provide.

Notes:

- A meter must be used to measure volumes[7].
- Please update the table required.
- If entries are longer than 5 lines, provide an Excel spreadsheet soft copy with the data. If a soft copy is provided - use the same headings and naming conventions as per the required daily or weekly table following.

Daily

Are any attachments included?	☐ Yes ☐ No
If yes, provide attachment name/s	

Meter brand type		**Meter serial number**	

Start date and time	**Start meter reading**	**End date and time**	**End meter reading**	**Volume taken**	**Units** (L, kL, ML)	**Date and time record made**

Weekly

If entries are longer than 5 lines, provide an Excel spreadsheet soft copy with the data. If provided in soft copy - use the same headings and naming conventions as per the table below.

Are any attachments included?	☐ Yes ☐ No
If yes, provide attachment name/s	

Meter brand type		**Meter serial number**	

Week ending	Start date and time	Start meter reading	End date and time	End meter reading	Volume taken	Units (L, kL, ML)	Date and time record made

Section H: Summary of water level measurements from monitoring bores

Refer to the approval you hold to determine if required. If required, enter information in the table below and provide all measurement data separately in an Excel spreadsheet (soft copy).

If automatic loggers are used, the default Excel output soft copy, will be accepted provided it includes all the relevant measurement data and units.

If automatic loggers are not used, the Excel output soft copy must include as a minimum the following:

- Bore ID
- Date
- Time
- Water level measurement (m below MP)
- Measuring point description
- Measuring point RL (m AHD)
- Comments.

Are any attachments included?	☐ Yes ☐ No
If yes, provide attachment name/s	

Bore ID	Measuring point RL (m AHD)	Depth to water before dewatering (m)	Depth to water during dewatering (m)	Depth to water after dewatering (m)	File name of measurements spreadsheet attached
For Example: MB1	1.000	0.5	4.0	0.6	MB1.xlsx

Section I: Water testing undertaken

Information supporting these entries must be captured and supplied as an attachment in Excel soft copy form.

Are any attachments included?	☐ Yes ☐ No
If yes, provide attachment name/s	

a) Range in pH measured	
b) Range in electrical conductivity (Salinity) in (µS/cm)	
c) Any other exceedance of water quality criteria?	☐ Yes (specify on the next page) ☐ No

Exceedance(s)

Section J: Declaration

I declare all information contained in this record is accurate, true and complete.

Signature	Date	
Name/Company officeholder		
Position	Phone	
Address		
Suburb	State	Postcode
Email		

Giving false or misleading information is a serious offence under Part 5A of the *Crimes Act 1900*. It is an offence under section 91J of the *Water Management Act 2000* for a person to make a statement or furnish information in or in connection with a metering record required to be kept that the person knows to be false or misleading in a material particular.

Privacy statement

The personal information that is provided in this form will be managed by WaterNSW in accordance with its Privacy Procedure, or other such Policy document as updated from time to time. The information provided in this form is being collected and used for purposes relating to the Record confirmation of specified matters before water is taken described in this form to the *Water Management Act 2000* (NSW). The information provided in this form may be disclosed to public authorities and other authorised parties as required.

If you choose not to provide the requested information in this form, you may not be able to take water and you may be in breach of the *Water Management Act 2000*. You have the right to request access to, and correct details of, your personal information held by WaterNSW. Further information regarding privacy can be obtained from waternsw.com.au/privacy

Returning completed forms

Please return your completed form/s and any attachments to:
Customer.Helpdesk@waternsw.com.au
In the subject line: Dewatering completion report - Approval (Approval reference number)

or by post to: **WaterNSW, PO Box 398, Parramatta NSW 2124**

Where to get help

Further information is available at waternsw.com.au/dewatering. If you need further assistance, please contact our Customer Service Centre on 1300 662 077, Monday to Friday between 8am to 5pm or email Customer.Helpdesk@waternsw.com.au

Notes

1. **Aquifer interference activity** has the same meaning as set out in the Dictionary to the *Water Management Act 2000* which is an activity involving any of the following:

   a. the penetration of an aquifer,
   b. the interference with water in an aquifer,
   c. the obstruction of the flow of water in an aquifer,
   d. the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations,
   e. the disposal of water taken from an aquifer as referred to in paragraph d).

2. Refer to your approval for the **groundwater source** you are taking water from.

3. For infrastructure or construction projects this may be the **applicant's representative** for example a contractor.

4. **Describe the activity/s taking groundwater** while conducting the aquifer interference activity, and the number of works involved. For example:

   - extraction using a battery of 15 spear points to dewater a building construction site
   - groundwater extracted from a permanent sump in a building basement
   - groundwater extracted from a trench or excavation

5. Examples of the **means by which the groundwater is taken** include surface pump, airlift, downhole/submersible pump, bailer, water removed with ground materials, water freely draining from a cutting, pit seepage / inflow, evaporation from artificial lake that has filled from groundwater. Where several means of take are involved please identify the number and type of each.

6. Please provide GPS coordinates as longitude and latitude in decimal degrees.

7. Metering equipment must be used to measure volumes. Metering equipment consists of a meter and a data logger. **Telemetry is not required.** However, other metering equipment and standards may be specified by a condition of the water supply work approval. In the **event metering equipment becomes faulty**, you must report within 24 hours to WaterNSW at waternsw.com.au/s91i. An offence applies under section 91IA of the *Water Management Act 2000* for failing to report faulty metering equipment within 24 hours.

8. For Section F - I: Duration of dewatering (pumping) is elapsed time between the start and end dates for a period of continuous take. If the period of take extends over more than one water year, annual reporting may be required. This record must be retained for five years.

9. Record the **total volume of groundwater taken** in the water year/s for the groundwater source in either litres (L), kilolitres (kL) or megalitres (ML).

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