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Our Ref: PSM5568-008L REV B Formal Lodgement

17 February 2026

Assistant Development Manager
Goodman
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Attention: Athena Vercoe

Dear Athena

**RE: 12 MARS ROAD, LANE COVE WEST NSW -
GEOTECHNICAL COMMENTS ON SEARS ITEM 13 - GROUND AND WATER CONDITIONS**

1. Executive Summary

This report has been prepared by PSM to accompany a State Significant Development Application (**SSDA**) for the construction and ongoing operation of a data centre facility at 12 Mars Road, Lane Cove West in the Lane Cove Government Area (**LGA**). The site is legally described as Lot 22 in Deposited Plan 732062.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project Mars Data Centre Project (SSD-82052708) dated 10th April 2025.

This report concludes that the proposed data centre is suitable and warrants approval.

2. Introduction

A State Significant Development Application (SSDA) has been prepared to support a data centre at 12 Mars Road, Lane Cove West. The site area is 33,559m^2 and is zoned E4 General Industrial.

The proposal will include:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and operation of a three-storey data centre building with a total gross floor area of approximately 21,832m^2 comprising:
  - 24 parking spaces
  - 2 loading dock spaces
  - 2 levels of technical data hall floor space
  - 3 level office and amenities building
- Provision of required utilities including:
  - diesel storage tanks
  - water tanks
  - substations on site

- Vehicle and pedestrian access provided via Mars Road.
- Associated landscaping and site servicing.
- Installation of site services and drainage infrastructure.
- A floor space ratio of approximately 0.65:1.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project Mars Data Centre (SSD-71368959) dated 10th April 2025.

Specifically, this report has been prepared to respond to the SEARs requirement listed below.

Item	Description of Requirement	Section reference (this report)
13. Ground and Water Conditions	• Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils. • Provide a Surface and Groundwater Impact Assessment that assesses potential impacts on: ○ surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. ○ groundwater resources in accordance with the *Groundwater Guidelines*.	Section 3

The site is located in Lane Cove West within the Lane Cove Local Government Area (LGA). It is bound by Mars Road to the north, Woodcock Place to the west, Blackman Park to the south and an industrial site to the east.

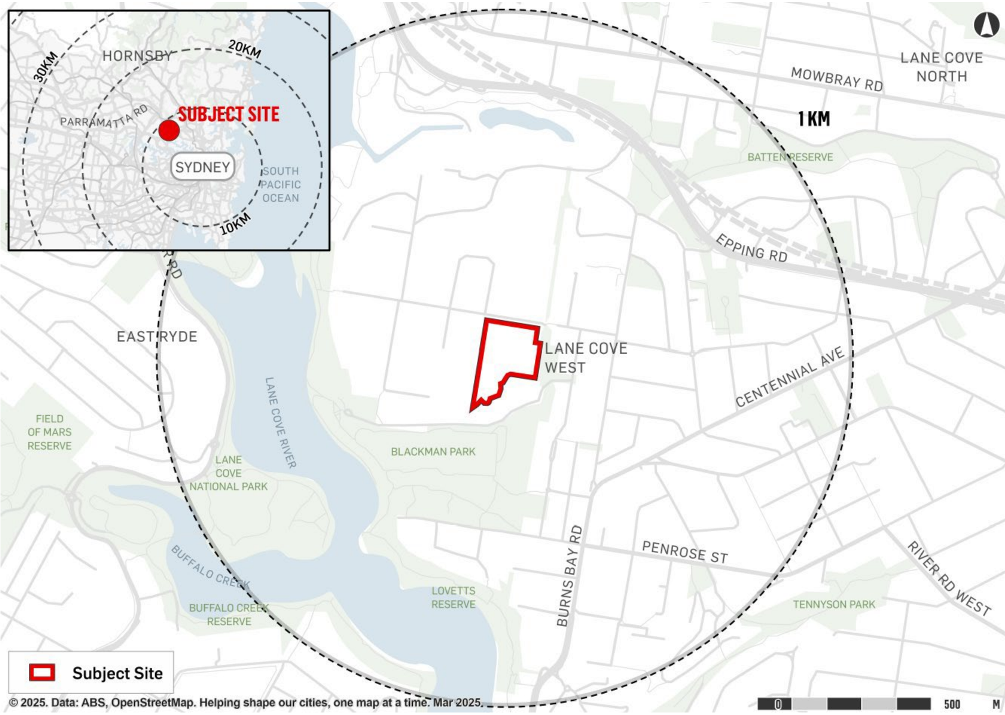
The site is located in the Lane Cove West Business Park which is a key economic and employment precinct in the Lane Cove LGA. The Lane Cove West Business Park contains a range of land uses including Cochlear, Storage King, Lane Cove Gymnastics Club, Novis Healthcare and an Airtrunk Data Centre.

The site comprises one individual allotment totalling 33,559m^2. It is currently occupied by 4 warehouse buildings with ancillary office spaces.

The closest residential uses to the site are 200m to the east of the site on Wood Street, Lane Cove West and 250m to the north of the site on Banksia Close.

The site is well serviced by transport and is within close proximity to Epping Road and the M2 Motorway.

Inset 1: Site Aerial (Urbis, 2025)



Inset 2: Local Context (Urbis, 2025)

3. Assessment of SEARS – Geotechnical Items

This section presents our response to some of Item 13 of the SEARs. Table 1 reproduces the requirements (list numbering added for clarity).

Table 1 – SEARs Requirements

Item	Description of Requirement
13. Ground and Water Conditions	1. Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils. 2. Provide a surface and groundwater impact assessment that assess potential impacts on: a. Surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses. b. Groundwater resources in accordance with the *Groundwater Guidelines.*

3.1 ITEM 1 - *Assess potential impacts on soil resources and related infrastructure and riparian lands on and near the site, including soil erosion, salinity and acid sulfate soils.*

PSM Response:
Details of the earthworks to be undertaken at the Site (e.g. civil cut-fill plans) are not known to PSM however the provided architectural plans by HDR indicate that the proposed development will include excavation of soil and rock up to 8 m depth as well as some areas of filling. We assess that from a geotechnical point of view, the proposed development will likely have close to no impact on the soil resource at the site.

With regard to the impact on existing related infrastructure, all existing structures / buildings on site will be demolished prior to development. The proposed development includes a three-level building with one level of basement. We assume the excavation support for the basement will be designed to avoid impacts on neighbouring structures.

It is expected that appropriate erosion control will be implemented during construction and the civil designer will design the stormwater system, surface gradients and landscaping to control surface water flows and minimise soil erosion and the effects of soil erosion. We note that the majority of the site will be sealed by the proposed development and we assume that appropriate surface runoff collection and disposal systems will be included in the design; similar to the current existing facility. We understand riparian lands / areas are not present however are adjacent to the eastern boundary of the Site, Inset 3. The impacts of the proposed development on riparian lands on and near the site will be minimal given appropriate erosion and surface water flows controls as mentioned above are implemented.

A Salinity Management Plan (SMP) has been prepared to effectively manage site salinity, minimise the effect of the proposed development on salinity processes and to protect the proposed development from salinity damage. Refer to the separate letter PSM5568-007L REV2 for our assessment and recommendations.

According to SEED[1] (Sharing and Enabling Environmental Data in NSW), the potential for acid sulfate soil risk is not present on site.

Further comments/inputs from other disciplines (e.g. civil designer, ecologist, etc.) should be requested if required.

[1] https://datasets.seed.nsw.gov.au/dataset/

Inset 3: **Riparian land and watercourses at / near Site (ref. SEED The Central Resource for Sharing and Enabling Environmental Data in NSW)**

3.2 ITEM 2a - *Provide a surface and groundwater impact assessment that assess potential impacts on: Surface water resources (quality and quantity) including related infrastructure, hydrology, dependent ecosystems, drainage lines, downstream assets and watercourses.*

PSM Response:

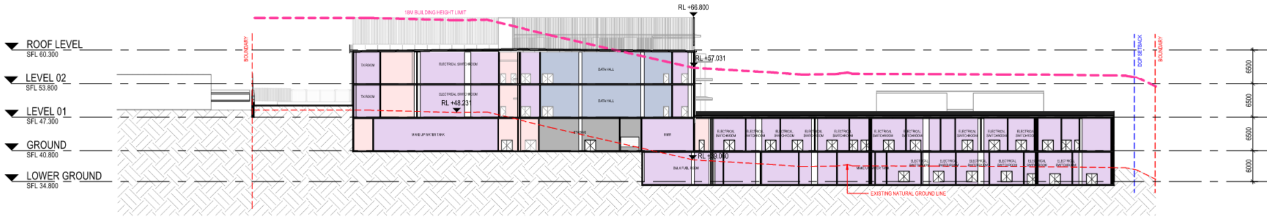
Impacts on surface water resource (quality and quantity), impacts on dependent ecosystems, drainage lines, downstream assets and watercourses are not addressed by PSM. A suitably qualified ecologist, drainage/civil designer, environmental consultant, or other suitably qualified person(s) should be engaged to address these items.

3.3 ITEM 2b – *Provide a surface and groundwater impact assessment that assess potential impacts on: Groundwater resources in accordance with the Groundwater Guidelines.*

PSM Response:

In our geotechnical investigation (refer to PSM5568-005L REV2), groundwater levels were observed between RL 37.9 m AHD and RL 34.9 m AHD across the Site.

As noted above in our response to Item 1, the architectural plans by HDR provided to us indicate that the proposed development will include excavations up to 8 m deep. The structural floor level (SFL) for the lowest two levels are 34.8 m AHD for the Lower Ground Level and 40.8 m AHD for the Ground Floor Level (refer Inset 4).



2 Section 2
1 : 500

Inset 4: East to west section through proposed development from undated HDR Architectural Drawings prepared for SEARs application

The excavation for the Lower Ground level is below the current ground water level. PSM has therefore undertaken an assessment of the impact of the proposed excavation on the ground water level including assessment of potential inflows into the excavation. Refer to separate letter PSM5568-010L REVB for our assessment, Appendix A.

4. Conclusion

This report concludes that the proposed data centre (as designed) is suitable from a groundwater perspective and warrants approval.

Yours Sincerely

HENRY ZHANG
GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

Appendix A
PSM5568-010L REV B Formal Lodgement - Groundwater Impact Assessment

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Our Ref: PSM5568-010L REV B Formal Lodgement

17 February 2026

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Athena.Vercoe@goodman.com

Attention: Athena Vercoe

Dear Athena

RE: PROJECT MARS - 12 MARS ROAD, LANE COVE WEST - GROUNDWATER IMPACT ASSESSMENT

1. Executive Summary

This report has been prepared by PSM to accompany a State Significant Development Application (**SSDA**) for the construction and ongoing operation of a data centre facility at 12 Mars Road, Lane Cove West in the Lane Cove Government Area (**LGA**). The site is legally described as Lot 22 in Deposited Plan 732062.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project Mars Data Centre Project (SSD-82052708) dated 10th April 2025.

This report concludes that the proposed data centre is suitable and warrants approval.

2. Introduction

A State Significant Development Application (SSDA) has been prepared to support a data centre at 12 Mars Road, Lane Cove West. The site area is 33,559m^2 and is zoned E4 General Industrial.

The proposal will include:

- Site preparation works including demolition, bulk excavation and removal of existing structures on the site, tree and vegetation clearing and bulk earthworks.
- Construction, fit-out and operation of a three-storey data centre building with a total gross floor area of approximately 18,829m^2 comprising:
  - 24 parking spaces
  - 2 loading dock spaces
  - 2 levels of technical data hall floor space
  - 3 level office and amenities building
- Provision of required utilities including:
  - diesel storage tanks

- water tanks
- substations on site

- Vehicle and pedestrian access provided via Mars Road.
- Associated landscaping and site servicing.
- Installation of site services and drainage infrastructure.
- A floor space ratio of approximately 0.65:1.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) and accompanying cover letter issued for the Project Mars Data Centre (SSD-82052708) dated 10th April 2025.

Specifically, this report has been prepared to respond to the SEARs requirement listed below.

Item	Description of Requirement	Section reference (this report)
13. Ground and Water Conditions	Provide a Surface and groundwater Impact Assessment that assesses potential impacts on: - Groundwater resources in accordance with *Groundwater Guidelines*	Section 8

2.1 The Site

The site is located in Lane Cove West within the Lane Cove Local Government Area (LGA). It is bound by Mars Road to the north, Woodcock Place to the west, Blackman Park to the south and an industrial site to the east.

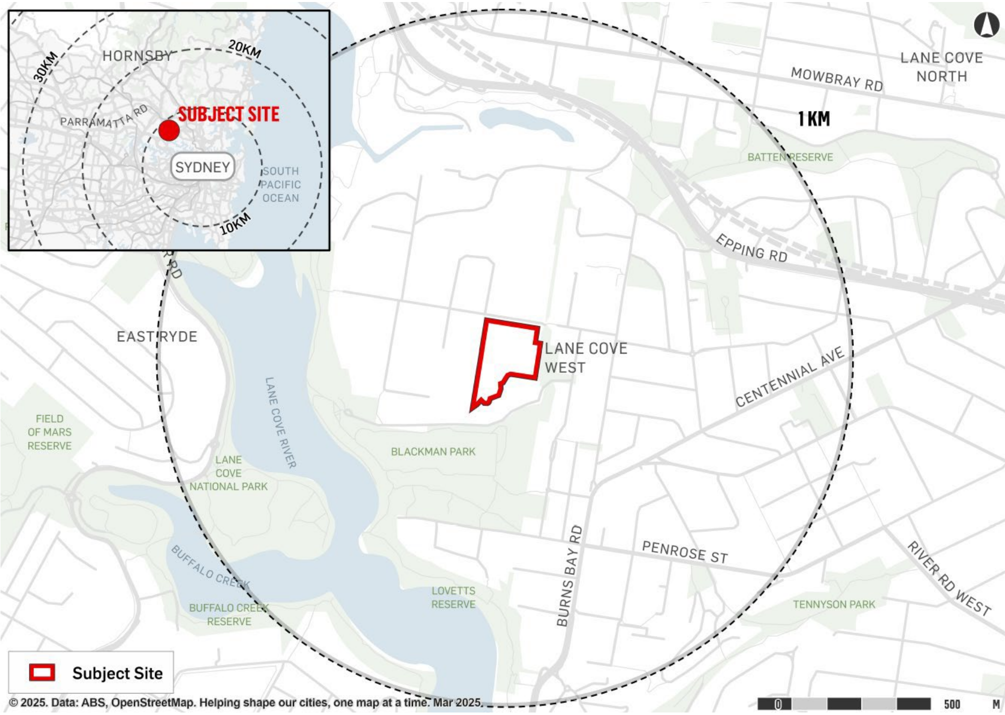
The site is located in the Lane Cove West Business Park which is a key economic and employment precinct in the Lane Cove LGA. The Lane Cove West Business Park contains a range of land uses including Cochlear, Storage King, Lane Cove Gymnastics Club, Novis Healthcare and an Airtrunk Data Centre.

The site comprises one individual allotment totalling 33,559m^2. It is currently occupied by 4 warehouse buildings with ancillary office spaces.

The closest residential uses to the site are 200m to the east of the site on Wood Street, Lane Cove West and 250m to the north of the site on Banksia Close.

The site is well serviced by transport and is within close proximity to Epping Road and the M2 Motorway.

Inset 1: Site Aerial (Urbis, 2025)



Inset 2: Local Context (Urbis, 2025)

3. Background

This letter presents a groundwater impact assessment for the proposed excavation within the data centre development at 12 Mars Road, Lane Cove West (the Site). The works has been undertaken in accordance with our proposal PSM5568-009L dated 3 April 2025.

We note the groundwater impact assessment undertaken for the proposed basement development (lower ground footprint) was based on the geometry presented in the architectural drawing set submitted as part of the SEARs application (dated 24 April 2025); the relevant drawings are listed in Section 3.4. Subsequently, a review of the updated architectural drawings submitted for the TOA application stage (dated 8 August 2025) indicates there is minimal changes in the proposed basement geometry and location. The updated geometry is still consistent with the assumptions undertaken for the model assessment in Section 3.4, hence this assessment is still applicable for the TOA application stage.

3.1 Site Topography

The existing topography of the Site generally consists of a fall towards the south-east with differences in elevation of up to approximately 20 m across the Site. An approximately 9 m high batter is located in the south-west part of the site.

Based on NSW Base Map[1], Inset 3, the highest point of the Site is approximately 50 m AHD in the north-west corner of the Site and drops to 30 m AHD in the south-east corner of the Site.

[1] https://datasets.seed.nsw.gov.au/dataset/nsw-basemap/resource/e24560e7-b48e-44a0-a367-92b30fd091d9

Inset 3: Site Topography with contour lines (ref. NSW Base Map)

3.2 Geological Setting

The Sydney 1: 100,000 Geological Map (1993) indicates that the Site is likely to be underlain by:

- Hawkesbury Sandstone (Rh) comprising medium to coarse-grained quartz sandstone, very minor shale and laminate lenses.

Inset 4 presents the geological map of the Site.

Inset 4: 1:100,000 Geological Map of Sydney (approximate site boundary shown in red)

3.3 Ground Conditions

PSM has completed site investigations at the Site including drilling a total of eleven (11) boreholes, with five (5) boreholes extending below the SFL of the Lower Ground level. The results of the geotechnical investigation and the inferred subsurface conditions at the Site are presented in PSM5568-005L REV1, dated 7 May 2025.

Figure 1 shows the location of the completed boreholes relative to the approximate location of the proposed building.

Based on the results of geotechnical site investigation, the ground conditions at the Site may be summarised as follows:

- Concrete pavement 0.13 to 0.39 m thick.
- Existing Fill comprising roadbase below pavement overlying Sandy CLAY trace gravel to Gravelly CLAY. Typically, 0.3 m to 0.8 m thick. Loose SAND inferred to be a trench backfill was encountered in one borehole to 2.2 m depth.
- Natural Soil comprising Gravelly to Clayey SAND and CLAY to sandy CLAY. Thickness between 0.1 m to 1.5 m thick.
- Bedrock comprising very low strength, weathered Sandstone grading to medium to high strength, moderately weathered to fresh Sandstone at depth.
- A localised buried structure was encountered at BH02a located within the footprint of the Lower Ground Level was inferred from early drilling refusal and backfill material.

It is noted that two bedrock units (Bedrock A and Bedrock B) were defined in PSM5568-005L REV1 based on strength and weathering characteristics. For the groundwater impact assessment presented in this letter, a single bedrock unit is considered with similar hydrogeological parameters and groundwater flow behaviour i.e. groundwater primarily flows through the fractures / defects of fractured rock mass.

The proposed SFL of the Lower Ground and Ground levels are situated mainly within the bedrock unit.

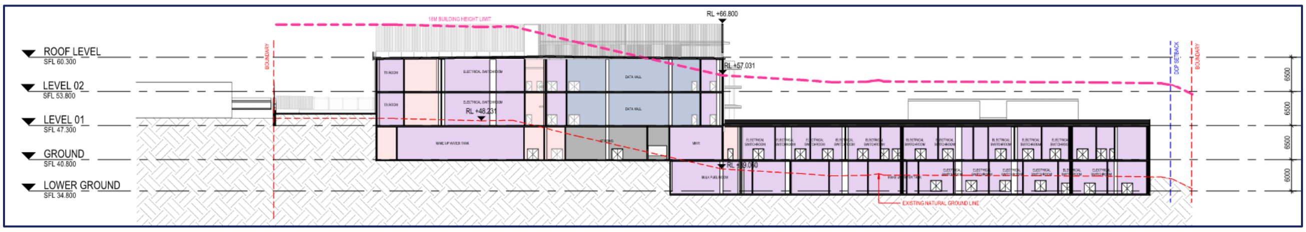
3.4 Proposed Building

PSM has been provided with the following document:

- Architectural Drawings of the proposed development by HDR for the following:
  - TOA Application (ref. MAR-AR-DRG-00000 to -06000 Revision A dated 8 August 2025)
  - SEARs application (ref. MAR-AR-DRG-21001 to -31001 dated 24 April 2025)

Based on these architectural drawings, we understand the following regarding the proposed development:

- The proposed building comprises four levels. Due to the sloping site, the two lowest levels (Lower Ground and Ground) require a variable amount of excavation up to a maximum of approximately 8 m (Inset 5). The Structural Finish Level (SFL) of Lower Ground and Ground level are 34.8 m AHD and 40.8 m AHD, respectively.
  - In the absence of civil earthworks drawings, we have adopted a Bulk Excavation Level (BEL) 0.8 m below the SFL (i.e. 34.0 m AHD for the Lower Ground level). This is to account for structural floor, waterproofing, etc.
- The Lower Ground level will have:
  - Width and length of approximately 92 m x 64 m.
  - Area of approximately 5900 m^2.
  - Height of 6 m
- The Lower Ground and Ground levels will serve a variety of functions such as:
  - Data halls
  - Bulk fuel rooms
  - Electrical switchrooms and battery rooms
  - Water tanks
  - Storage
- The design of the excavation (i.e. drained or tanked) is not known to PSM at this stage, but our assessment assumes it is drained.



Inset 5: East to west section through proposed development from undated HDR Architectural Drawings prepared for SEARs application

4. Regulatory Considerations

4.1 General

Constructing buildings with basement excavations which intercept an aquifer is considered an aquifer interference activity in accordance with the NSW Aquifer Interference Policy. Therefore, the proposed development is subject to the Water Management Act 2000, relevant water sharing plans, and needs to be assessed against the NSW Aquifer Interference Policy.

4.2 Water licencing

Applicants must seek appropriate licences and approvals for a building project before construction starts.

Where predicted maximum long term groundwater inflows into a planned drained basement excavation during operation of the development are expected to be less than 3 ML/year, such developments could be considered as a ‘minor aquifer interference activity’ which are generally exempt from the full extent of the Water Management Act and therefore may not require a licence.

This is discussed in the WaterNSW Fact Sheet titled *Water access licence exemption for aquifer interference activities taking 3ML or less of groundwater per year*. This fact sheet includes a list of common aquifer interference activities to which the exemption may apply, one of which is the ‘ongoing dewatering of basements’.

Ultimately the decision as to whether a licence will be required for the long-term passive collection of groundwater inflows into a planned basement excavation will be at the discretion of WaterNSW.

4.3 NSW Aquifer Interference Policy (DPIE Office of Water, 2012)

The purpose of the Aquifer Interference Policy (AIP) is to explain the role and requirements of the Minister administering the Water Management Act 2000 in the water licensing and assessment processes for aquifer interference activities under the Water Management Act 2000 and other relevant legislative frameworks.

The AIP sets out Minimal Impact Considerations to be applied to assess the impact of the proposed aquifer interference activity, in this case the construction and ongoing dewatering of a basement.

4.4 Groundwater Investigation Requirements (DPIE, 2022)

The document “Minimum Requirements for Building Site Groundwater Investigations and Reporting” (DPIE, 2022) recommends implementing a tanked basement which results in no ongoing dewatering as such a design reduces / eliminates:

- Energy demand from the continual operation of the pump-out system.
- The required maintenance demand to keep the pumps operating and drainage lines free of clogging from the aeration of mineral-rich groundwater.
- The water demand on the surrounding groundwater system and optimises the availability of groundwater for all users.
- The additional administrative demand to retain records and maintain valid approvals, licences, or both, that would otherwise be imposed on the future managers of the property.

Where a drained basement is implemented, it should be designed to minimise the ongoing water take, i.e. within the volumes that would typically be exempt from licencing, as discussed in Section 4.2.

Where a drained basement is proposed:

- A groundwater assessment shall be undertaken to appropriately predict the likely inflow volumes and drawdown and its effect on neighbouring structures, ecosystems, and groundwater users.
- Engineering measures should be designed and constructed to meet as far as practical the aims listed in the dot points above with respect to ongoing energy, maintenance and administrative requirements on future managers of the property.

4.5 Disposal/reuse of groundwater

Should a drained basement be adopted, groundwater flowing into the basement during construction and in perpetuity will need to be either re-used on site as grey water or for irrigation purposes or be disposed of either in the stormwater or sewer systems.

Where disposal is proposed this will need to be agreed with the appropriate authorities, i.e. Local Council for stormwater and Sydney Water for sewer. Each authority will have their requirements with regards to peak and average flows and water quality.

5. Groundwater Monitoring Data

5.1 Piezometers

As part of the geotechnical investigation (refer PSM5568-005L REV2), PSM installed three (3) standpipe piezometers at the Site as shown on Figure 1. Construction records of the piezometers are presented in Appendix A. Photo 1 on Figure 2 shows a typical constructed piezometer with a well cap.

5.2 Groundwater Monitoring Data

Following the piezometer installations, the groundwater was manually measured on several site visits in late 2024 and early 2025:

- 20-22 November 2024
- 4 December 2024
- 17-21 April 2025
- 6 May 2025.
- 13 August 2025.

Continuous groundwater monitoring has also been established in accordance with Department of Planning and Environment requirement (ref. *Minimum requirements for building site groundwater investigations and reporting,* dated October 2022).

Table 1 presents the groundwater monitoring results.

Figures 3 to 5 presents the groundwater level monitoring results.

Table 1 – Results of Groundwater Monitoring

BH ID	Collar RL (RL m)[1]	Base of Piezometer (RL m)	Screened RL (RL m) & Material[3]	Groundwater Level Measurements (RL m)				
				2024		2025		
				20-22 Nov	4 Dec	17-21 Apr	5 May	13 Aug
BH02	37.8	27.0	30.9 to 27.0 BEDROCK B	36.3	36.4	36.5	36.6	36.4
BH05b	47.1	37.1	43.6 to 37.1	37.6	37.4	37.7	37.9	37.9

BH ID	Collar RL (RL m)[1]	Base of Piezometer (RL m)	Screened RL (RL m) & Material[3]	Groundwater Level Measurements (RL m)				
				2024		2025		
				20-22 Nov	4 Dec	17-21 Apr	5 May	13 Aug
			BEDROCK B					
BH09	37.8	29.8	35.8 to 32.6 BEDROCK A / BEDROCK B	N/A		35.1	34.9	34.9

Notes:
1. The surface RL of borehole location was approximated from 1m Digital Elevation Models downloaded from https://elevation.fsdf.org.au/ - NSW Government Spatial Services. These collar levels should be checked when survey plan is available.
2. N/A Not Applicable – BH09 was not constructed at the time of those measurements in 2024.

6. PSM Field testing – Rising Head Tests – 21 April 2025

A total of three (3) “slug” tests were performed on 21 April 2025 in each of the piezometers at the Site.

“Slug” tests refer to falling or rising head tests completed in standpipe piezometers. Rising head tests were performed in which the following methodology was undertaken:

- Groundwater was first pumped out /removed of the piezometers.
- Then the rise in groundwater level (due to groundwater recharge) was continuously monitored using a HOBO water level data logger recording data at one (1) second increments.

The results of the rising head tests are presented in Appendix B.

7. Groundwater Inflow Assessment – Numerical Modelling (Seepage Analysis)

7.1 Methodology

Structural and waterproofing details of the proposed structure (e.g. if it is a tanked or drained structure) are not known to PSM however, it is assumed for this assessment that the structure is drained.

In order to estimate the inflows during excavation, we have undertaken a series of steady state seepage analyses using the finite element seepage package SEEP/w, produced by GEO-SLOPE International Ltd.

7.2 Model Geometries

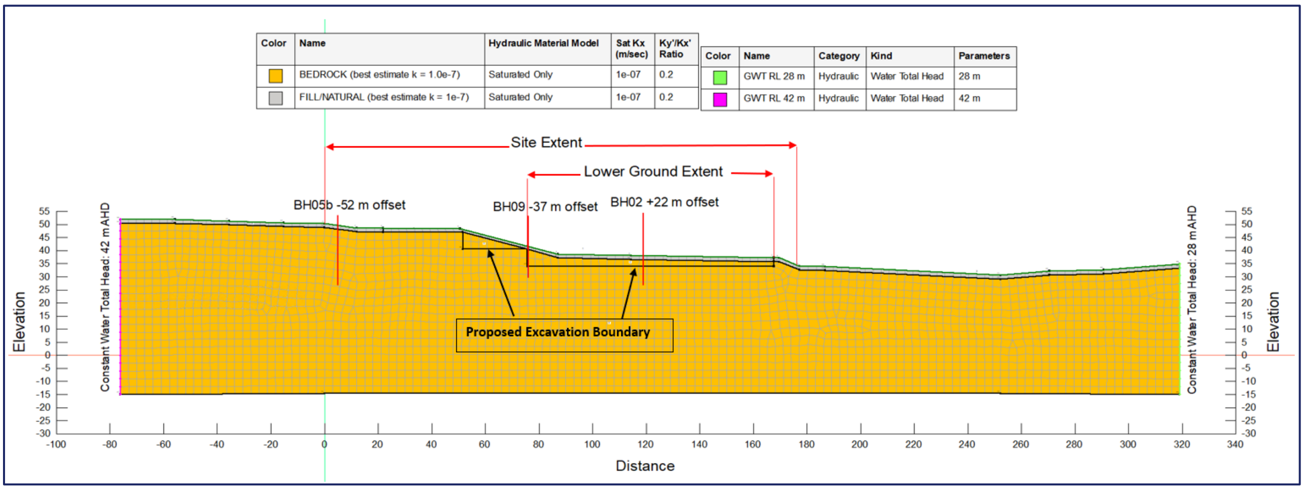
For the analyses we have adopted a 2D section consistent with Building Section 2 from the Architectural drawings set by HDR (refer Inset 5). This section strikes north-west to south-east, through the middle of the lower ground level.

Inset 6 presents the geometry adopted for the seepage analysis which includes:

- Model width of approximately 395 m.
- Maximum excavation depths of:
  - Lower Ground: 7.4 m (west) to 3.6 m (east). Bulk Excavated Level (BEL) = 34.0 m AHD
  - Ground: 6.5 m (west) to 0 m (east). BEL = 40.0 m AHD
- Combined Fill and Natural soil units a uniform thickness of 1.5 m.

The existing ground surface profile within the neighbouring sites was obtained using data sourced from ELVIS – Elevation and Depth – Foundation Spatial Data[2].

[2] https://elevation.fsdf.org.au/



Inset 6: SEEP/W Model geometry

7.3 Model Inputs

7.3.1 Hydraulic Conductivity Parameters

The adopted hydraulic conductivity parameters of the SOIL and BEDROCK units are summarised in Table 2. These parameters have been assessed based on:

- The geotechnical characteristics of the units.
- Typical conductivities adopted for these units in projects across Sydney both from published literature and from our experience developing hydrogeological models for various major tunnelling and infrastructure projects in Sydney sandstone.
- Results of Site-specific slug tests (refer Section 6).

Table 2 – Summary of Adopted Hydraulic Conductivity Parameters

Unit	Horizontal Hydraulic Conductivity K_h (m/sec)			K_h/K_v
	Best Estimate	Upper Bound	Lower Bound	
SOIL (Fill / Natural) (Sand / Clay)	1.0×10^{-7}	1.0×10^{-6}	1.0×10^{-8}	5
BEDROCK	1.0×10^{-7}	1.0×10^{-6}	1.0×10^{-8}	5

7.3.2 Analysis runs

The analysis runs undertaken are summarised in Table 3.

Table 3: Analysis Runs

Run	Excavation	Permeability (k_h) adopted (refer Table 2)
Run 1 – Calibration	No excavation – current ground level	Best estimate
Run 2	Excavation complete	Best estimate
Run 3	Excavation complete	Upper bound
Run 4	Excavation complete	Lower bound

7.3.3 Model Calibration

Model calibration for seepage analysis was undertaken by iteratively altering the boundary conditions presented in Section 7.3.4 to ensure the models total head output results were consistent with ground water monitoring data from the Site .

Appendix C presents the calibration model and results.

7.3.4 Boundary Conditions

The following boundary conditions were adopted for the models:

- A total head of 42 m AHD at the western side of the model.
- A total head of 28 m AHD at the eastern side of the model.
- A seepage face along the boundary of the excavation.

7.4 Results

Appendix D presents the model geometry and results.

Based on the SEEP/W analyses, the estimated inflows into the excavation are presented in Table 4.

Assuming the basement is drained not 'tanked', the excavation will result in a drawdown of the water table to the BEL of the Lower ground level.

Table 4 – Summary of Estimated Water Inflow

	Units	Best Estimate	Upper Bound	Lower Bound
Total Estimated Water Inflow	L/sec	8.0E-03	8.0E-02	8.0E-04
	ML/year	0.3	2.5	0.03

8. Groundwater Impact Assessment

8.1 Water Licencing Requirements

The predicted maximum long term groundwater inflows into the proposed drained excavation are less than 3 ML/year (Table 4).

The proposed excavation can thus be considered as a 'minor aquifer interference activity' which are generally exempt from the full extent of the Water Management Act and therefore may not require a license. This is discussed in the WaterNSW Fact Sheet titled *Water access license exemption for aquifer interference activities taking 3ML or less of groundwater per year*.

Ultimately the decision as to whether a license will be required for the long-term passive collection of groundwater inflows into the planned excavation will be at the discretion of WaterNSW.

8.2 Groundwater Investigation Requirements (DPIE, 2022)

The document "Minimum Requirements for Building Site Groundwater Investigations and Reporting" (DPIE, 2022) indicates that drained basements can be considered where the ongoing water take is minimal i.e. within the volumes that would typically be exempted from licencing.

As discussed in previous sections, the work presented in this letter indicates minimal water intake and thus we consider that the DPIE planning document would contemplate adopting a drained basement at the Site.

The DPIE planning document requires that where a drained basement is proposed:

- A groundwater assessment shall be undertaken to appropriately predict:
  - The likely inflow volumes and drawdown. This is presented in Section 7.4.
  - The effect of the drawdown on neighbouring ecosystems and groundwater users. This is discussed in 8.3
  - The effect on neighbouring structures. This is discussed in Section 8.4.
- Engineering measures should be designed and constructed to meet as far as practical the aims listed in the dot points above with respect to ongoing energy, maintenance, and administrative requirements

on future managers of the property. These measures are discussed in Sections 9.5, 9.6 and 9.7 respectively.

8.3 AIP Minimal Impact Considerations

The Aquifer Interference Policy (AIP) includes a set of minimal impact considerations for assessing the impacts of aquifer interference activities including those regulated under the WMA 2000, the Water Act 1912 and those decided under the terms and conditions of other legislation.

Both the soils and rocks at the site are of relatively low yield (≤5 L/s) and are thus considered a *"less productive groundwater source"* and *"Fractured Rock Water Source"* as defined in the AIP.

The proposed development is expected to have impacts that are less than the Level 1 minimum impact considerations, which according to the AIP minimal consideration requirements, would be considered as acceptable.

8.4 Effect on neighbouring structures and ecosystems

The groundwater table at the site are contained within the fractured sandstone bedrock unit (i.e. not within the overlying soil units). On this basis, we consider that any minor drawdown resulting from a drained excavation at the Site would be unlikely to result in settlements that would damage neighbouring properties or ecosystems.

8.5 Long term energy demand

Given the estimated long-term inflows associated with a drained excavation, a sump and pump drainage system could be considered appropriate. Assuming steady state inflows of 3 ML/yr (this is much higher than our upper bound estimate and is thus a conservative assumption), this is equivalent to approximately 8.5 m^3/day.

Assuming a pump (or two pumps) capable of pumping at 20 L/s, this would result in the pump being in operation for approximately 42 hrs throughout the year. Assuming a 20 m^3 sump, this would result in the pump operating for around 16 minutes every 2 days.

Compared to other energy demands on the owners, such as air conditioning/heating or lights the use of pump can be considered a minimal long-term imposition on the owners.

8.6 Maintenance requirements

Adopting a drained basement can result in additional long term maintenance impositions on the owners of the property. These can however be minimised by appropriate design and construction.

Additional maintenance can result from:

1) Deterioration of exposed weak rock faces / batters subject to ongoing seepage

   We note that the bedrock units at the Site may degrade with time if left exposed with ongoing groundwater seepage. It is thus recommended that shotcrete facing be provided to protect against degradation. Alternatively, a plenum space between the rock face and an internal dry-wall can be adopted. This should be wide enough to allow maintenance access.

2) Maintaining the permanent drainage system.

   Where a drained basement is adopted, provision needs to be made for permanent and effective drainage. Such permanent drainage systems will either need to be maintained throughout the life of the structure or include redundancy in the system to allow for possible reduction in capacity in the future. Maintenance would typically involve flushing to remove chemical deposits that may build up over time.

   Details of the drainage system are a matter of design but would typically include a sub-floor drainage blanket with slotted drainage pipes within drainage aggregate, plus strip drains behind the shotcrete / concrete walls (or a plenum space between the rock face and an internal dry-wall where shotcrete is not required), and sump and pump system with the ability to effectively back flush the system for long-term maintenance.

By including redundancy in the drainage system, the need for maintenance can be reduced to where it does not result in unreasonable maintenance requirements in perpetuity.

3) Maintaining the water treatment plant (if required).

8.7 Disposal/Reuse of groundwater

Groundwater seepage into the excavation during construction and in perpetuity will need to be either re-used on site as grey water or for irrigation purposes or be disposed of either in the stormwater or sewer systems.

Where disposal is proposed this will need to be agreed with the appropriate authorities, i.e., Local Council for stormwater and Sydney Water for sewerage. Each authority will have their requirements with regards to peak and average flows and water quality.

The predicted yearly inflows are small and would not be expected to result in overloading of the stormwater system. Should capacity of the stormwater be considered an issue this could be addressed by sizing of the sump and pump to allow collection and disposal at low flow rates during periods of dry weather.

Water quality issues would need to be addressed separately, however we note that local water treatment plants can be used to treat the water if required.

8.8 Conclusions

In the sections above we have discussed the impact of the proposed drained excavation at the Site on:

- Groundwater resources
- Neighbouring structures
- Neighbouring groundwater users
- Long term energy demand on future owners
- Long term maintenance requirements on future owners
- Disposal/reuse of the intercepted groundwater.

On this basis we consider that the impact of a drained basement is minimal.

The above sections have also identified the approvals that will need to be sought and the measures that would need to be designed and constructed to result in this minimal impact in the long term.

9. Basement drainage design considerations

The permanent drainage system is a matter for design however we would expect it to comprise:

- A sub-floor drainage blanket with slotted drainage pipes within drainage aggregate,
- Strip drains behind the shotcrete / concrete walls (or a plenum space between the rock face and an internal dry-wall where shotcrete is not required),
- Sump and pump system with the ability to effectively back flush the system for long-term maintenance.

We recommend that such a system be designed and constructed, keeping in mind the recommendations regarding redundancy and disposal in Sections 8.6 and 8.7, and as a minimum:

- Include at least two sumps each with its own pump and emergency pump to allow for redundancy in the system.
- Consider potential for partial blockages in the drainage over the life of the building.
- Consider additional inflows into the system from rainfall infiltration, cleaning, potential flooding from broken services etc.
- Include ability to treat the inflow prior to disposal if required.
- Include ability to monitor the inflows and outflows from the system.
- Have enough storage capacity to allow discharge in lower flow rates and in dry periods to minimise load on receiving system.

On the above basis we consider that it would be prudent to design the permanent drainage system for long term inflows of 0.5 L/s and peak flows of up to 2 L/s. Whilst these are significantly greater inflows than are expected, the increased capacity would be expected to come at very minor additional costs and provide significant level of redundancy.

10. Groundwater Monitoring Requirements

Groundwater monitoring is required to be undertaken in order to satisfy the Department of Planning and Environment's (the Department) guidelines. The following section details the requirements set out by the Department regarding monitoring requirements. Groundwater monitoring guidelines are set out in the document, *Minimum requirements for building site groundwater investigations and reporting,* dated October 2022) by the Department.

10.1 Prior to Construction

The document has the following criteria for the setup of monitoring bores prior to construction:

1. A minimum of three (3) monitoring bores.
2. Location of bores to be outside the basement footprint to enable hydraulic-flow direction and gradient.
3. Depths of the monitoring bores to extend below depths of the proposed lowermost basement levels.
4. Screening of the wells from 2 to 5 m below ground level.
5. Monitoring intervals to be at minimum daily readings over a 3 monthly period prior to lodgement of the development application.

PSM's geotechnical investigation has addressed the requirements requested with the following exceptions:

- Screened Depths.

  Three (3) monitoring wells are located outside the proposed basement footprint. One (1) monitoring well is screened at 2 to 5 m below ground level and the other two (2) monitoring wells are screened at 5 to 8 m below ground level.

  We note hydrogeological properties are similar throughout the sandstone Bedrock encountered during the investigation.
- Minimum 3-month period of daily groundwater level monitoring.

  Continuous daily groundwater monitoring requirements in all three (3) monitoring wells have been undertaken since 17-22 April 2025. The earliest date to achieve a minimum of 3 months of continuous monitoring is 22 July 2025. The groundwater levels presented in the groundwater monitoring records (Figures 3 to 5) with at least 2 weeks of data have been relatively stable.

10.2 During Construction

The document has the same criteria as detailed in Section 10.1 for groundwater monitoring during construction. If piezometers are impacted or damaged during construction, additional replacement monitoring bores may be required. Groundwater monitoring will be required during the dewatering period and for one month following completion of dewatering works.

Additional groundwater quality monitoring of inflows before and after treatment, prior to discharging will also be required and should be specified in the dewatering management plan.

Yours Sincerely

HENRY ZHANG
GEOTECHNICAL ENGINEER

ROHAN STOCKER
ASSOCIATE GEOTECHNICAL ENGINEER

AGUSTRIA SALIM
PRINCIPAL

Encl.

Figure 1	Site Locality Plan
Figure 2	Selected Site Photos
Figures 3 to 5	Groundwater Monitoring Records
Appendix A	Well Construction Records
Appendix B	Rising Head Test Results
Appendix C	SEEP/W Seepage Analysis – Run 1 - Model Calibration
Appendix D	SEEP/W Seepage Analysis – Runs 2 to 4 – Model Geometry and Results

Legend

- Site Boundaries
- Basement - Lower Ground Footprint
- Long-Section
- Cored Boreholes
- Augered Boreholes
- Constructed Piezometers

Note:
1. All boundaries and locations are approximate.
2. Aerial imagery from Nearmap of site conditons from 28 May 2025.
3. Lower Ground Footprint from HDR drawing 'General Arrangement - Lower Ground Floor Plan' for SEARs application (ref. MAR-AR-DRG-21000 dated 24 August 2025).

Scale 1:2,000

N

0 20 40 60 80 100 m

Map Projection:
GDA2020 / MGA zone 56
EPSG:7856

PSM

Created By: PSM	Revision: A
Date: 16 Sep 2025	Paper Size: A4

Goodman
12 Mars Road, Lane Cove West
Groundwater Assessment

SITE LOCALITY PLAN

PSM5568-010L

Figure 1

GIS\02_WorkSpace\01_MXDs\PSM5568.qgz Layout: 010L - Figure 1

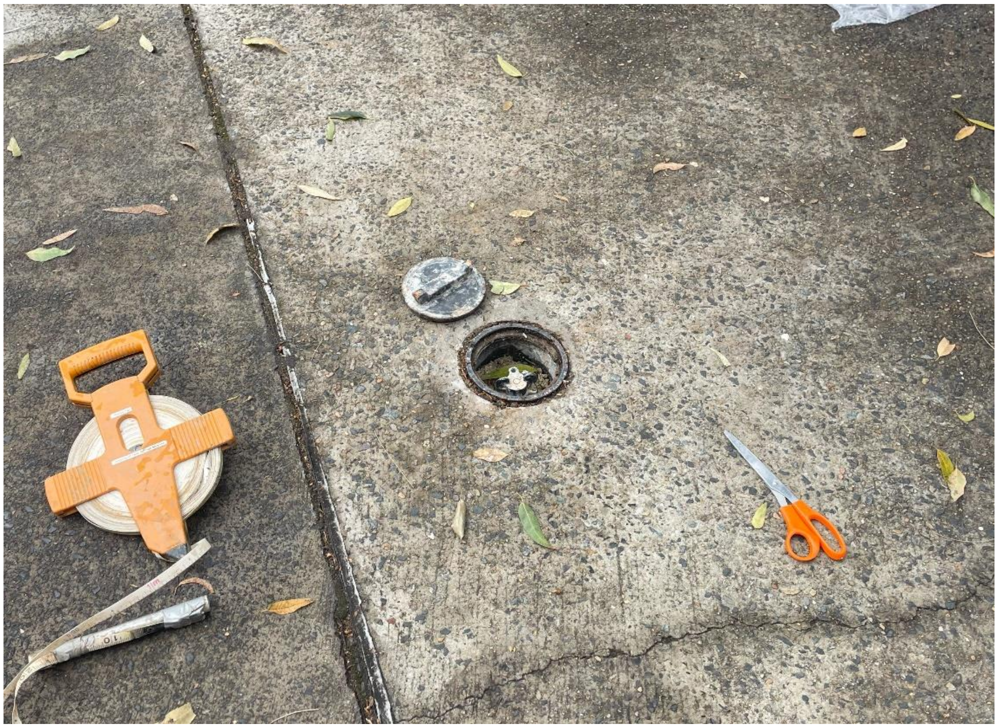


Photo 1 - Typical constructed piezometer with a well cap (BH05b)

Photo 2 - Performing slug test (rising head test) in BH02 - 22 April 2025

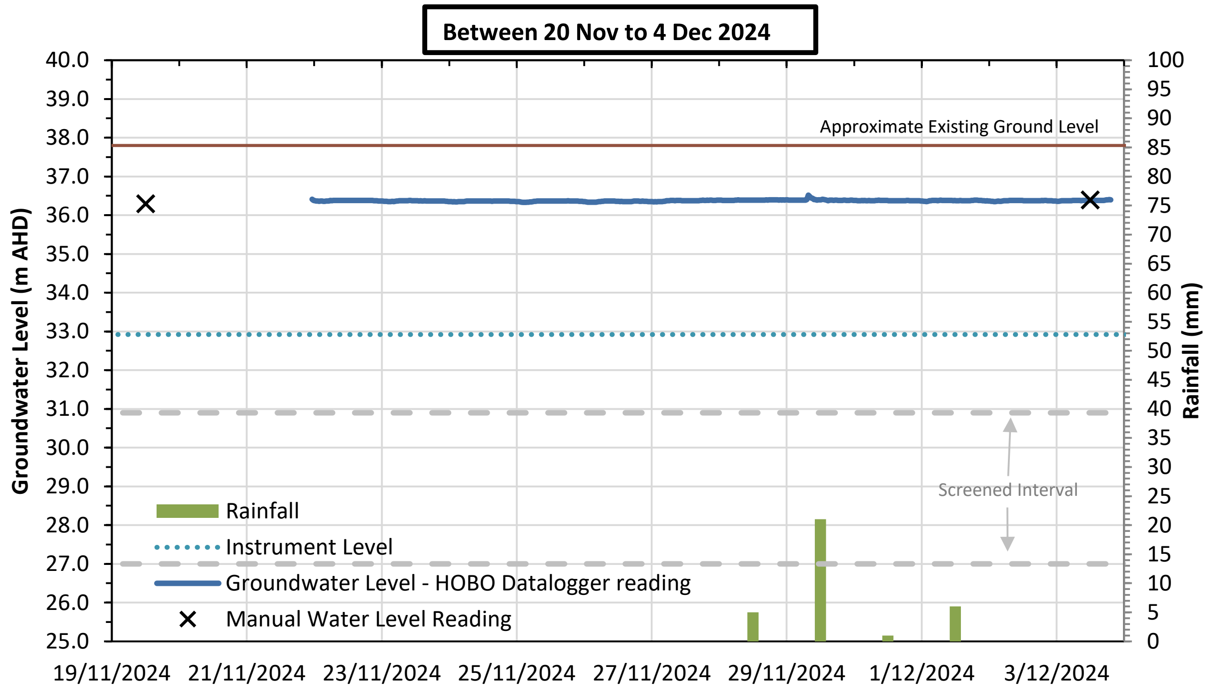
Goodman

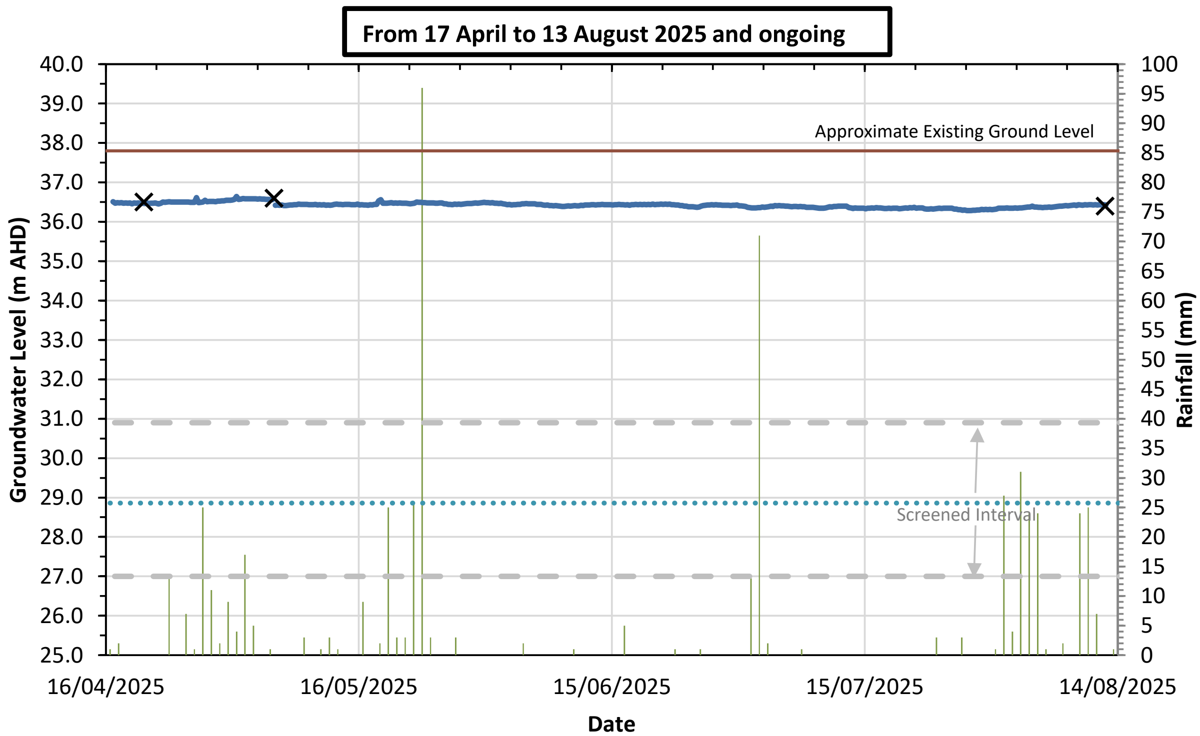
12 Mars Road, Lane Cove West

Groundwater Assessment

SELECTED SITE PHOTOS

PSM5568-010L	**Figure 2**



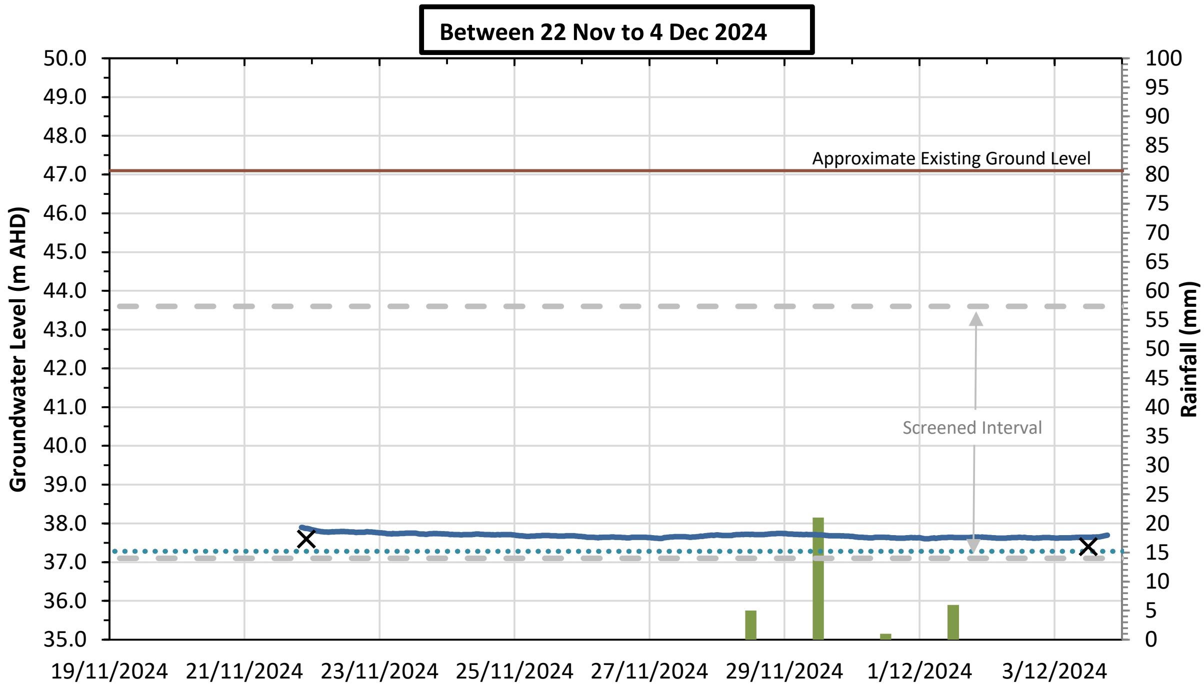


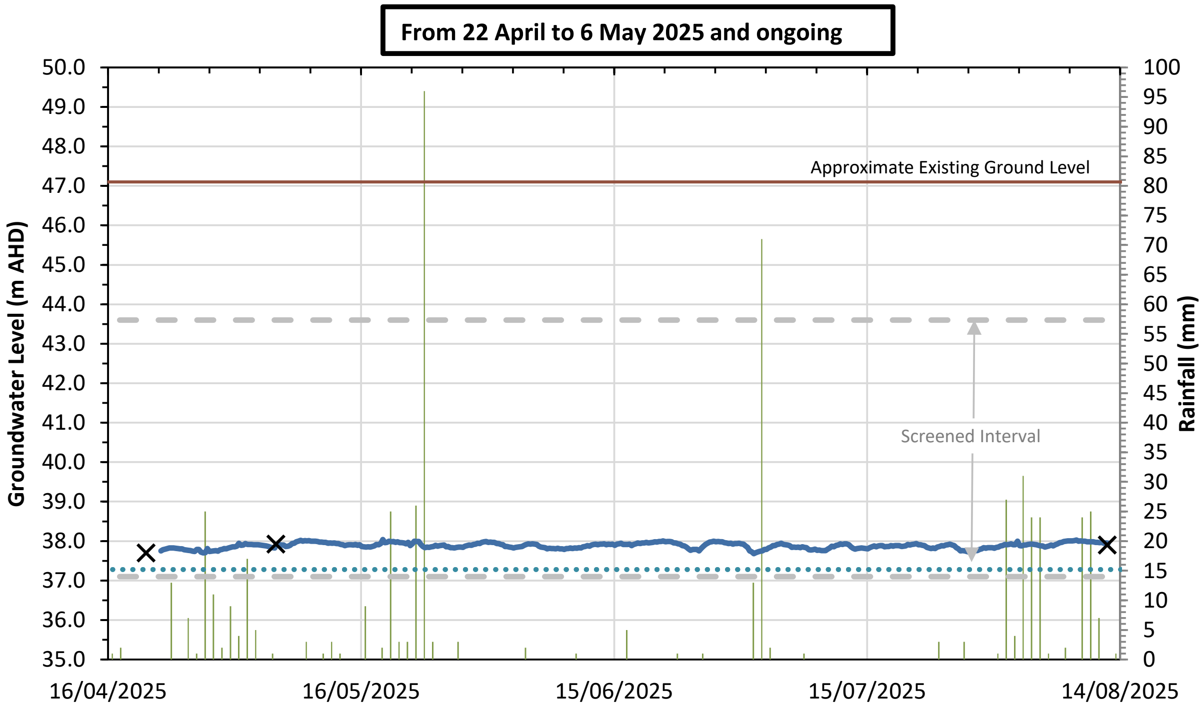
Notes:

1. Instrument depth: 8.94 m BGL. Initially installed at 4.9 m BGL between 20 Nov to 4 Dec 2024.
2. Base of piezometer at RL 27.0 m.
3. Rainfall data source: BOM Websit[e] North Ryde Golf Club (station numbe[r] :066213)

Goodman Property
12 Mars Road, Lane Cove West NSW
Groundwater Assessment
GROUNDWATER MONITORING RECORD
BH02

PSM5568-010L REV1	**Figure 3**





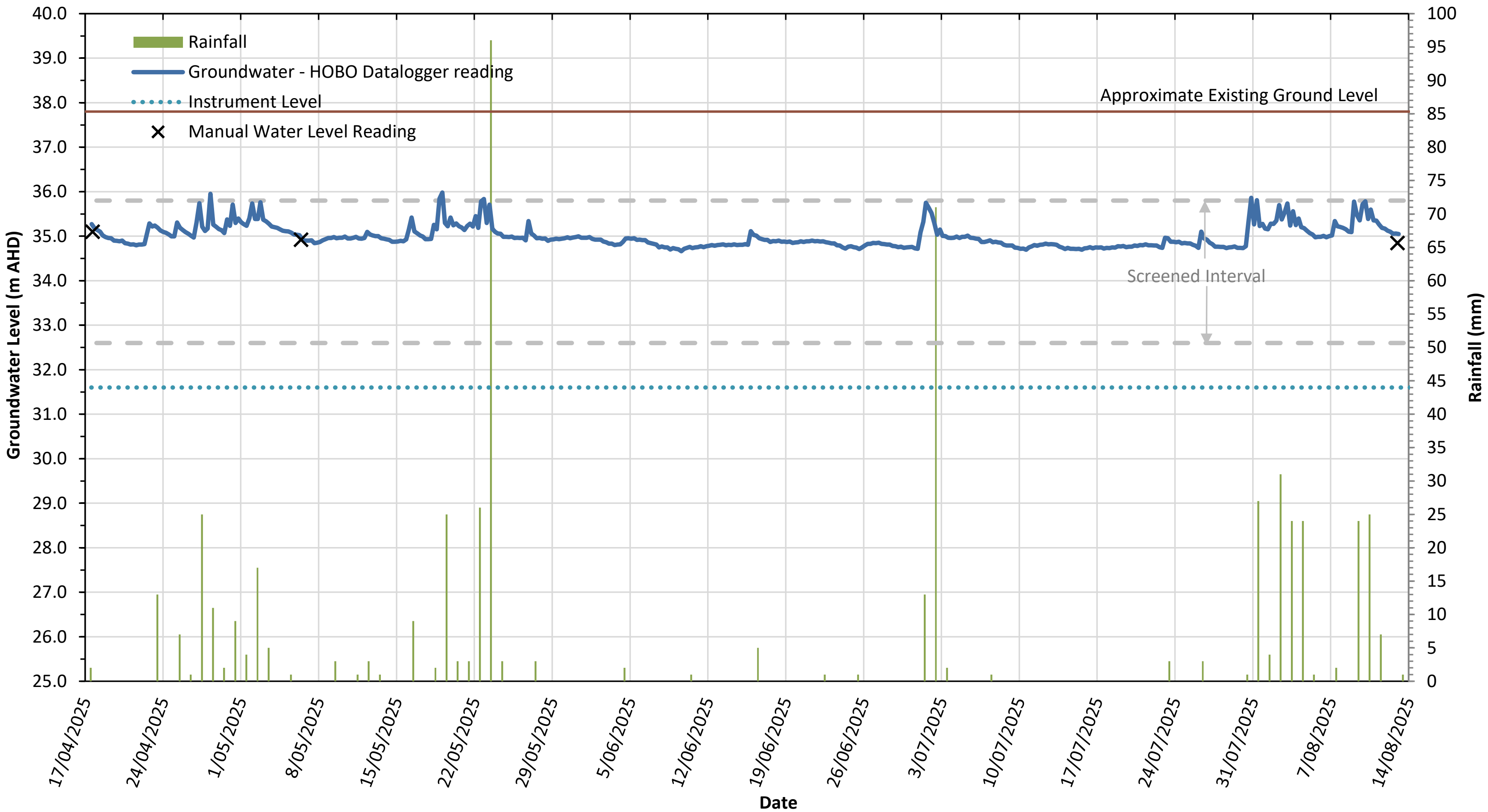
Notes:

1. Instrument depth: 9.82 m BGL.
2. Base of Piezometer at RL 37.1 m.
3. Rainfall data source: BOM Website. North Ryde Golf Club (station number: 066213)

Goodman Property
12 Mars Road, Lane Cove West NSW
Groundwater Assessment
GROUNDWATER MONITORING RECORD
BH05b

PSM5568-010L REV1	Figure 4

M:\PSM5568\Eng\Groundwater\Post-processing\[PSM5568 - GWL - Hobo Data - Figure.xlsm]BH09 chart



Notes:

1. Instrument depth: 6.2 m BGL
2. Base of Piezometer at RL 29.8 m.
3. Rainfall data source: BOM Website. North Ryde Golf Club (station number: 066213)
4. The instrument (data logger) was installed on 17 April 2025.

Goodman Property
12 Mars Road, Lane Cove West NSW
Groundwater Assessment
GROUNDWATER MONITORING RECORD
BH09

PSM5568-010L REV1	**Figure 5**

Appendix A
Well Construction Records

Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

JOB no.: PSM5568

PROJECT: 12 Mars Road, Lane Cove West

PIEZOMETER CONSTRUCTION RECORD

HOLE NUMBER:	BH02	DRILLING CONTRACTOR:	JK Drillling
PIEZOMETER:	PZ01	RIG:	JK500 - 11 tonne truck mounted drill rig
COLLAR EASTING:	328750	DEPTH OF HOLE (m):	10.8m EOH
COLLAR NORTHING:	6257173	BOREHOLE INCLINATION:	-90
COLLAR RL(m):	37.8	PIEZO INSTALLATION DATE:	20/11/2024
DATUM:	AHD	SUPERVISED BY:	HZ & KG

Tick boxes

Steel protective well cover ☑

PVC cap ☑

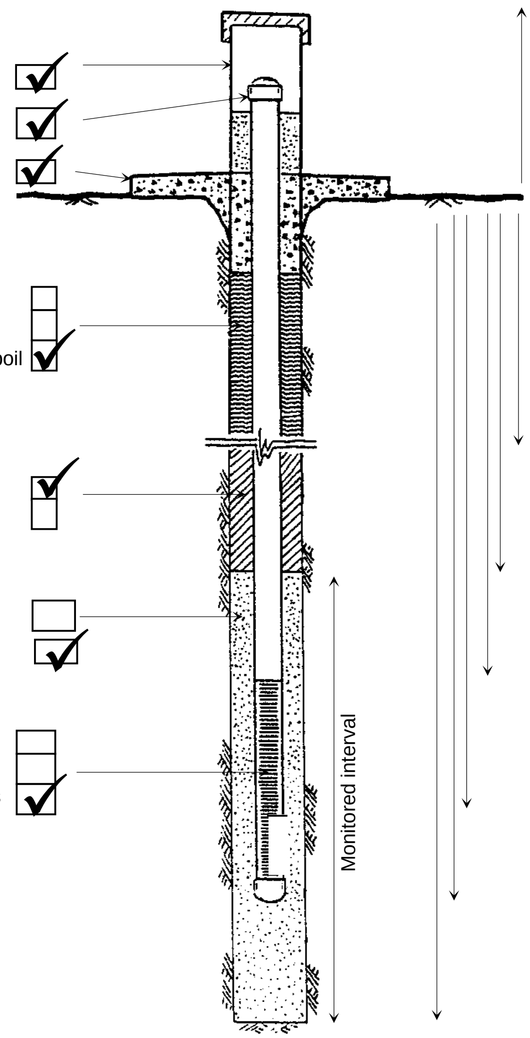
Concrete colar ☑

Back fill type:
Cement bentonite ☐
Soil ☐
Bentonite pellets/ Spoil ☑

Seal:
Bentonite pellets ☑
Other ☐

Gravel type:
2-5mm gravel ☐
Other (Specialised sand) ☑

Perforation type:
Drill holes ☐
Hack saw cuts ☐
40um machine slots ☑



Complete dimensions if appropriate

Height of stickup (m)	0
Diameter of PVC (mm)	50
Depth to top of seal	0.9
Depth to top of gravel pack	6.9
Depth to top of screen	7.8
Depth to base of screen	10.8
Depth to base of piezo	10.8
Depth to base of gravel	10.8

COMMENTS:
Water level measured on 6 May 2025 - 1.2 meters below ground level (RL 36.6 m)
HOBO data logger installed at 8.9 meters below ground level (RL 28.9 m)

Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

JOB no.: PSM5568

PROJECT: 12 Mars Road, Lane Cove West

PIEZOMETER CONSTRUCTION RECORD

HOLE NUMBER:	BH05b	DRILLING CONTRACTOR:	JK Drillling
PIEZOMETER:	PZ02	RIG:	JK500 - 11 tonne truck mounted drill rig
COLLAR EASTING:	328625	DEPTH OF HOLE (m):	10.0m EOH
COLLAR NORTHING:	6257119	BOREHOLE INCLINATION:	-90
COLLAR RL(m):	47.1	PIEZO INSTALLATION DATE:	21/11/2024
DATUM:	AHD	SUPERVISED BY:	HZ & PL

Tick boxes

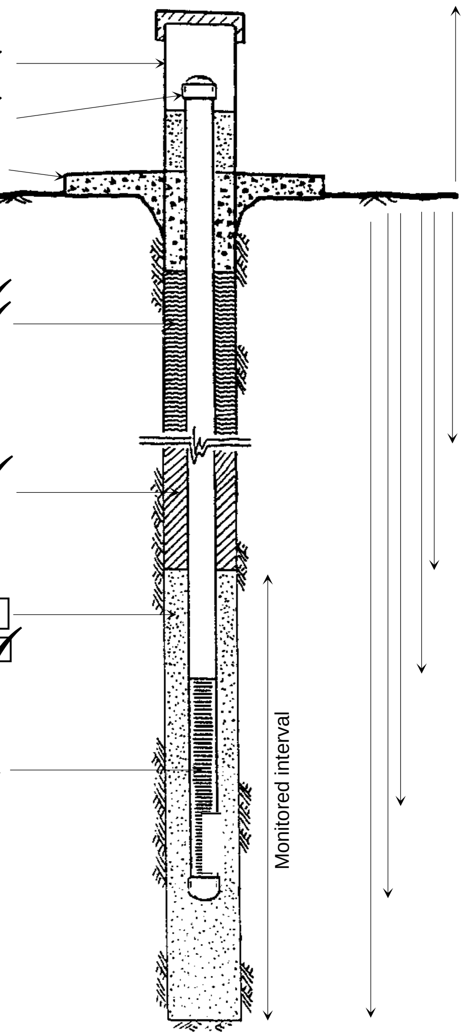
Steel protective well cover [x]
PVC cap [x]
Concrete colar [x]

Back fill type:
Cement bentonite [x]
Soil [x]
Bentonite pellets/ Spoil [ ]

Seal:
Bentonite pellets [x]
Other [ ]

Gravel type:
2-5mm gravel [ ]
Other (Specialised sand) [x]

Perforation type:
Drill holes [ ]
Hack saw cuts [ ]
40um machine slots [x]



Complete dimensions if appropriate

Height of stickup (m)	0
Diameter of PVC (mm)	50
Depth to top of seal	0.0
Depth to top of gravel pack	3.5
Depth to top of screen	4.0
Depth to base of screen	10.0
Depth to base of piezo	10.0
Depth to base of gravel	10.0

COMMENTS:
Water level measured on 6 May 2025 - 9.2 meters below ground level (RL 37.9 m)
HOBO data logger installed at 9.8 meters below ground level (RL 37.3 m)

Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

JOB no.: PSM5568

PROJECT: 12 Mars Road, Lane Cove West

PIEZOMETER CONSTRUCTION RECORD

HOLE NUMBER:	BH09	DRILLING CONTRACTOR:	JK Drillling
PIEZOMETER:	PZ03	RIG:	JK500 - 11 tonne truck mounted drill rig
COLLAR EASTING:	328697	DEPTH OF HOLE (m):	10.0m EOH
COLLAR NORTHING:	6257119	BOREHOLE INCLINATION:	-90
COLLAR RL(m):	37.8	PIEZO INSTALLATION DATE:	21/11/2024
DATUM:	AHD	SUPERVISED BY:	HZ & PL

Tick boxes

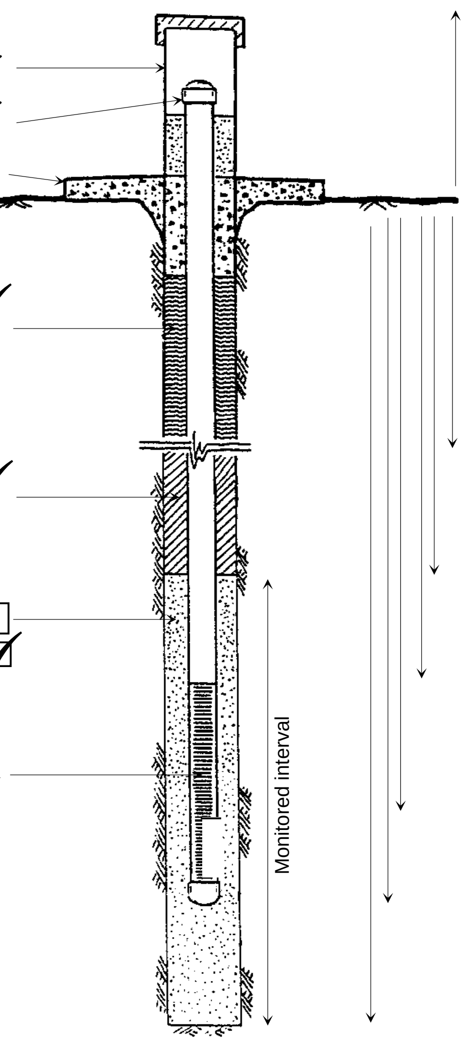
- Steel protective well cover ☑
- PVC cap ☑
- Concrete colar ☑

Back fill type:
- Cement bentonite ☑
- Soil ☐
- Bentonite pellets/ Spoil ☐

Seal:
- Bentonite pellets ☑
- Other ☐

Gravel type:
- 2-5mm gravel ☐
- Other (Specialised sand) ☑

Perforation type:
- Drill holes ☐
- Hack saw cuts ☐
- 40um machine slots ☑



Complete dimensions if appropriate

Height of stickup (m)	0
Diameter of PVC (mm)	50
Depth to top of seal	0.0
Depth to top of gravel pack	2.0
Depth to top of screen	2.0
Depth to base of screen	5.0
Depth to base of piezo	8.0
Depth to base of gravel	5.2

COMMENTS:
Water level measured on 6 May 2025 - 2.9 meters below ground level (RL 34.9 m)
HOBO data logger installed at 6.2 meters below ground level (RL 31.6 m)
The piezometer (around the pvc casing) was backfilled with bentonite pellets from 5.2 m to 8.0 m depth below the gravel pack
and screen.

Appendix B
Rising Head Test Results

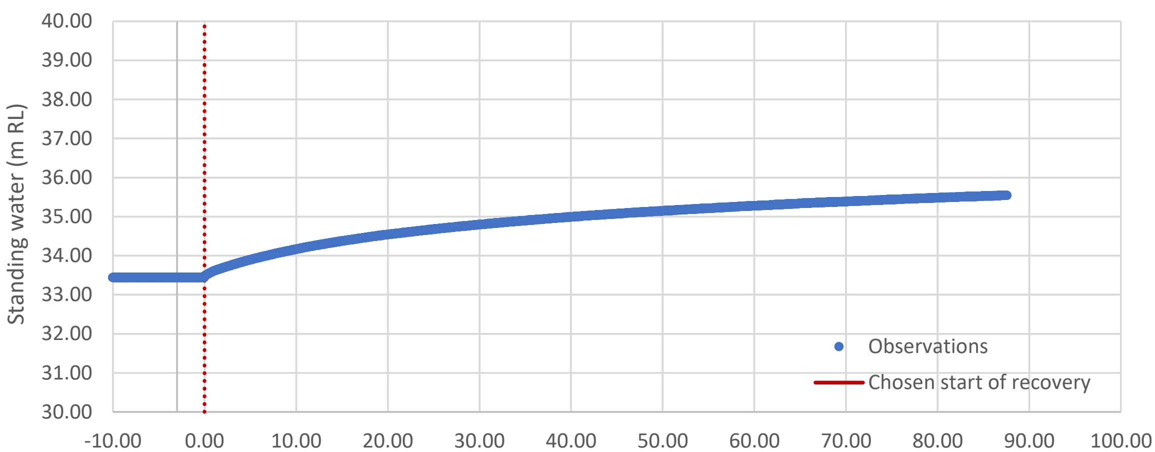
Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

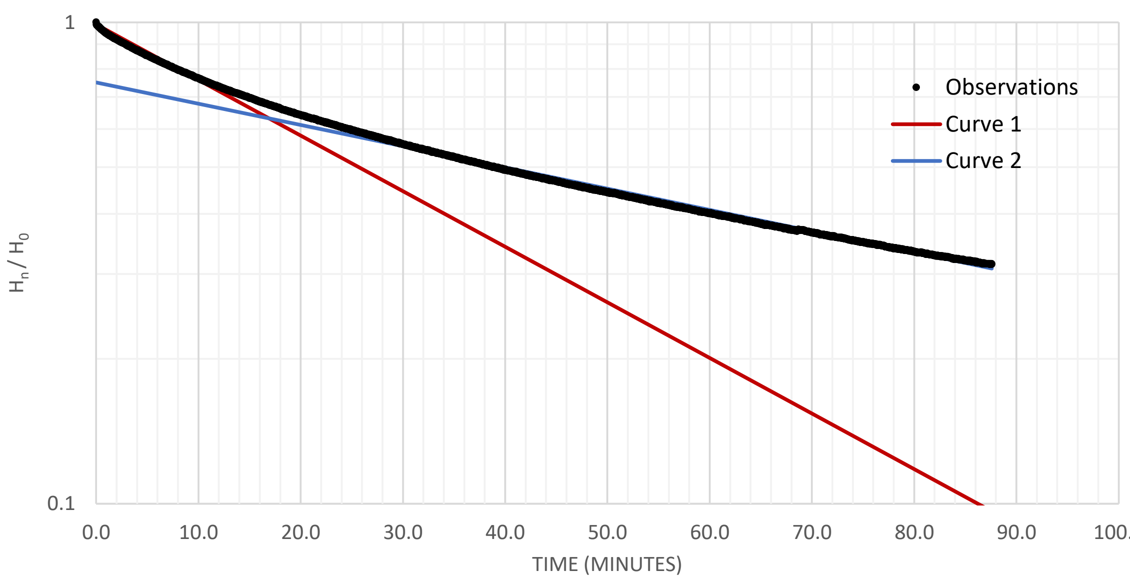
JOB no.: **PSM5568**

PROJECT: **12 Mars Road, Lane Cove West**

Slug Test - Rising Head Test

HOLE NUMBER:	**BH02**	DEPTH OF HOLE (m):	**10.80**
BORE EASTING:	**328750.0**	SCREEN LENGTH 'L' (m):	**3.9**
BORE NORTHING:	**6257173.0**	INTERNAL DIAMETER 'D_I' (m):	**0.038**
COLLAR RL(m):	**37.8**	EXTERNAL DIAMETER 'Do' (m):	**0.05**
DATUM:	**m AHD**	SCREEN SHAPE FACTOR 'F'	**4.85**
CONTRACTOR	**JK Drilling**	WATER DIP (m below collar)	**1.30**
WELL TESTED BY:	**HZ/AF**	STANDING WATER (m AHD)	**36.50**
SCREENED LITHOLOGY:	**BEDROCK - SANDSTONE**	DATE	**22-Apr-25**





	Time lag 'T'	Hydraulic conductivity 'k'	
	mins	m/s	m/day
Curve 1	37.6	1.0E-07	8.95E-03
Curve 2	98.4	4.0E-08	3.42E-03

From Hvorslev (1951) $k = \dfrac{A}{FT}$

where $A = \pi D_I^2/4$

$$F = \frac{2\pi L}{\ln\left(\frac{L}{D_o} + \sqrt{1 + \left(\frac{L}{D_o}\right)^2}\right)}$$

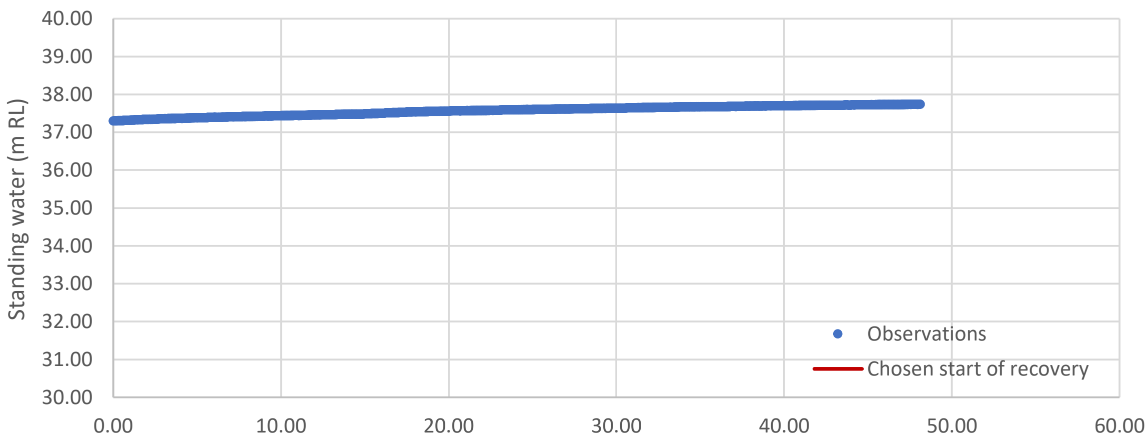
$$T = \frac{t_2 - t_1}{\ln(H_1/H_0) - \ln(H_2/H_0)}$$

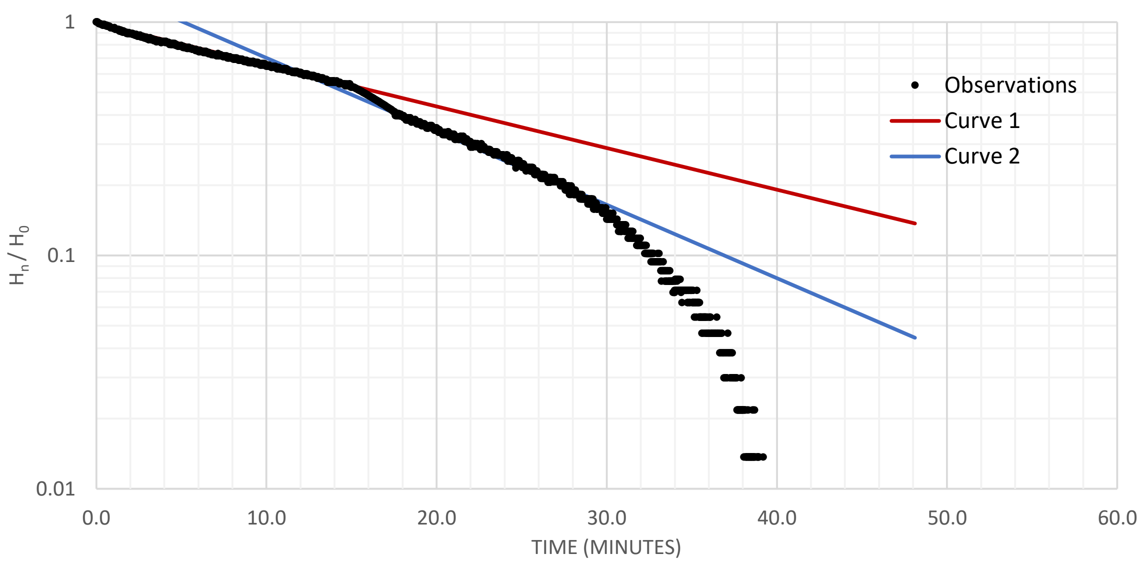
H_n = drawdown at time t_n

COMMENTS:

Slug Test - Rising Head Test

HOLE NUMBER:	**BH05b**	DEPTH OF HOLE (m):	**10.00**
BORE EASTING:	**328625.0**	SCREEN LENGTH 'L' (m):	**6.5**
BORE NORTHING:	**6257119.0**	INTERNAL DIAMETER 'D_I' (m):	**0.038**
COLLAR RL(m):	**47.1**	EXTERNAL DIAMETER 'Do' (m):	**0.05**
DATUM:	**m AHD**	SCREEN SHAPE FACTOR 'F'	**7.34**
CONTRACTOR	**JK Drilling**	WATER DIP (m below collar)	**9.40**
WELL TESTED BY:	**HZ/AF**	STANDING WATER (m AHD)	**37.70**
SCREENED LITHOLOGY:	**BEDROCK - SANDSTONE**	DATE	**22-Apr-25**





	Time lag 'T'	Hydraulic conductivity 'k'	
	mins	m/s	m/day
Curve 1	24.3	1.1E-07	9.14E-03
Curve 2	13.8	1.9E-07	1.61E-02

From Hvorslev (1951) $k = \dfrac{A}{FT}$

where $A = \pi D_I^2/4$

$$F = \frac{2\pi L}{\ln\left(\frac{L}{D_o} + \sqrt{1 + \left(\frac{L}{D_o}\right)^2}\right)}$$

$$T = \frac{t_2 - t_1}{\ln(H_1/H_0) - \ln(H_2/H_0)}$$

H_n = drawdown at time t_n

COMMENTS:

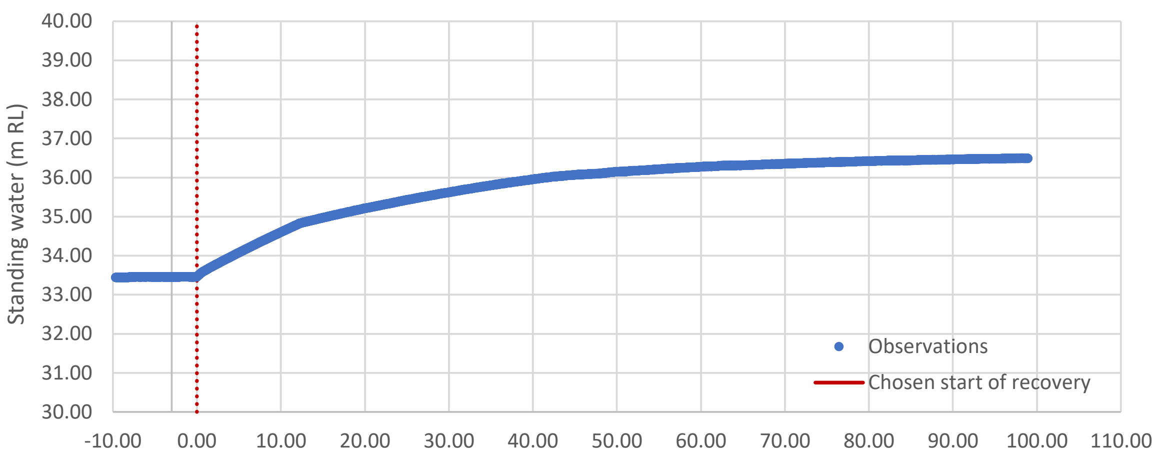
Pells Sullivan Meynink
Engineering Consultants
Rock - Soil - Water

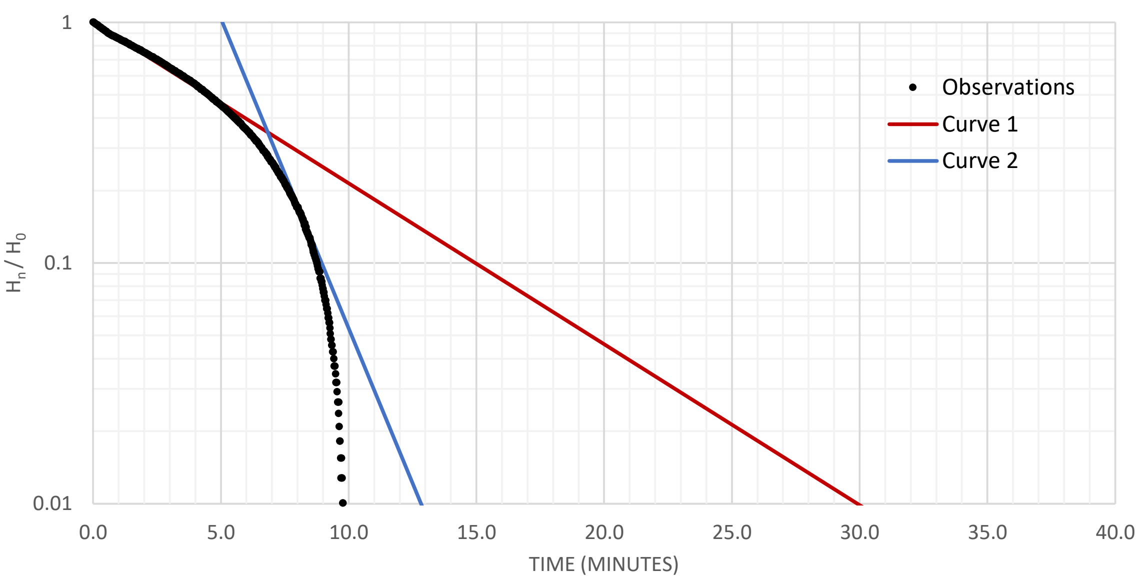
JOB no.: **PSM5568**

PROJECT: **12 Mars Road, Lane Cove West NSW**

Slug Test - Rising Head Test

HOLE NUMBER:	**BH09**	DEPTH OF HOLE (m):	**8.00**
BORE EASTING:	**328697**	SCREEN LENGTH 'L' (m):	**3.2**
BORE NORTHING:	**6257097**	INTERNAL DIAMETER 'D_i' (m):	**0.038**
COLLAR RL(m):	**37.8**	EXTERNAL DIAMETER 'Do' (m):	**0.05**
DATUM:	**m AHD**	SCREEN SHAPE FACTOR 'F'	**4.14**
CONTRACTOR	**JK Drilling**	WATER DIP (m below collar)	**3.22**
WELL TESTED BY:	**HZ/AF**	STANDING WATER (m AHD)	**34.58**
SCREENED LITHOLOGY:	**BEDROCK - SANDSTONE**	DATE	**22-Apr-25**





	Time lag 'T'	Hydraulic conductivity 'k'	
	mins	m/s	m/day
Curve 1	6.5	7.0E-07	6.07E-02
Curve 2	1.7	2.7E-06	2.33E-01

From Hvorslev (1951) $k = \frac{A}{FT}$

where $A = \pi D_I^2/4$

$$F = \frac{2\pi L}{\ln\left(\frac{L}{D_o} + \sqrt{1 + \left(\frac{L}{D_o}\right)^2}\right)}$$

$$T = \frac{t_2 - t_1}{\ln(H_1/H_0) - \ln(H_2/H_0)}$$

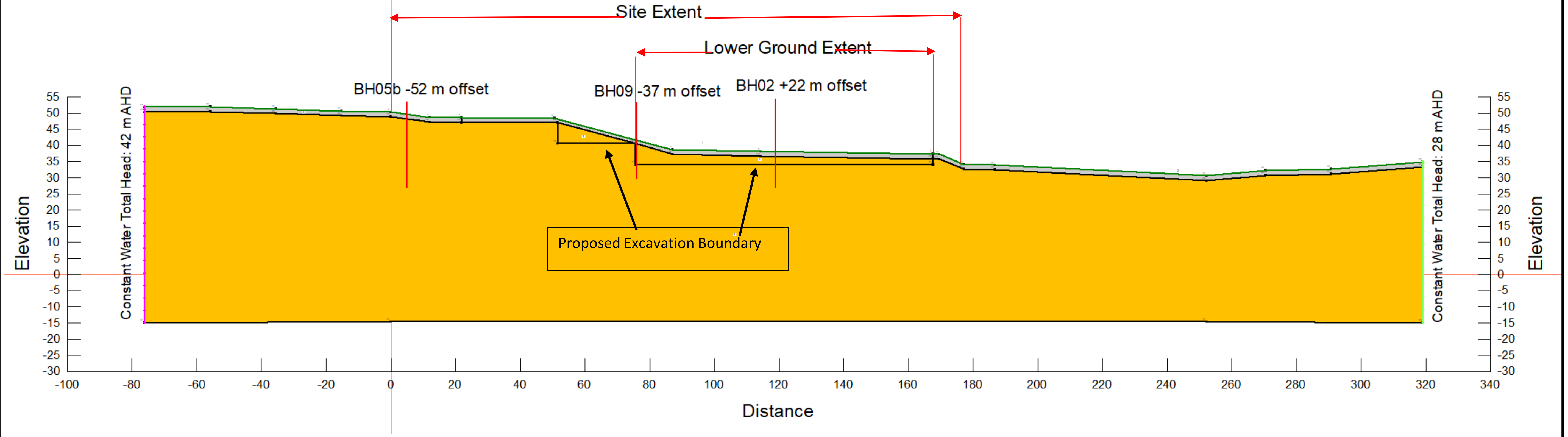
H_n = drawdown at time t_n

COMMENTS:

Appendix C
SEEP/W Seepage Analysis – Run 1 – Model Calibration

Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (best estimate k = 1.0e-7)	Saturated Only	1e-07	0.2
	FILL/NATURAL (best estimate k = 1e-7)	Saturated Only	1e-07	0.2

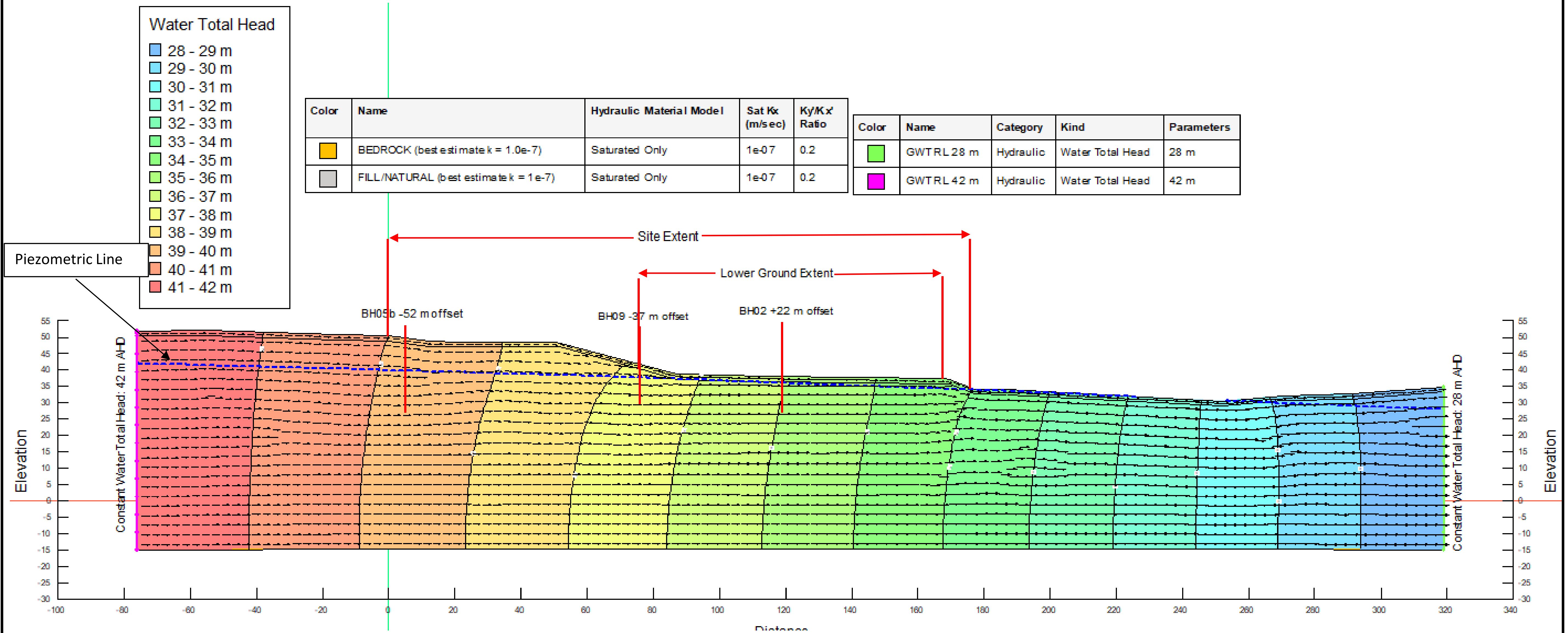
Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m



Notes:

1. All boundaries and locations are indicative and approximate.

Goodman 12 Mars Road, Lane Cove West NSW Groundwater Assessment RUN 1 - CALIBRATION MODEL MODEL GEOMETRY	
PSM5568-010L	APPENDIX C1



Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (best estimate k = 1.0e-7)	Saturated Only	1e-07	0.2
	FILL/NATURAL (best estimate k = 1e-7)	Saturated Only	1e-07	0.2

Color	Name	Category	Kind	Parameters
	GWTRL 28 m	Hydraulic	Water Total Head	28 m
	GWTRL 42 m	Hydraulic	Water Total Head	42 m

Notes:

1. All boundaries and locations are indicative and approximate.

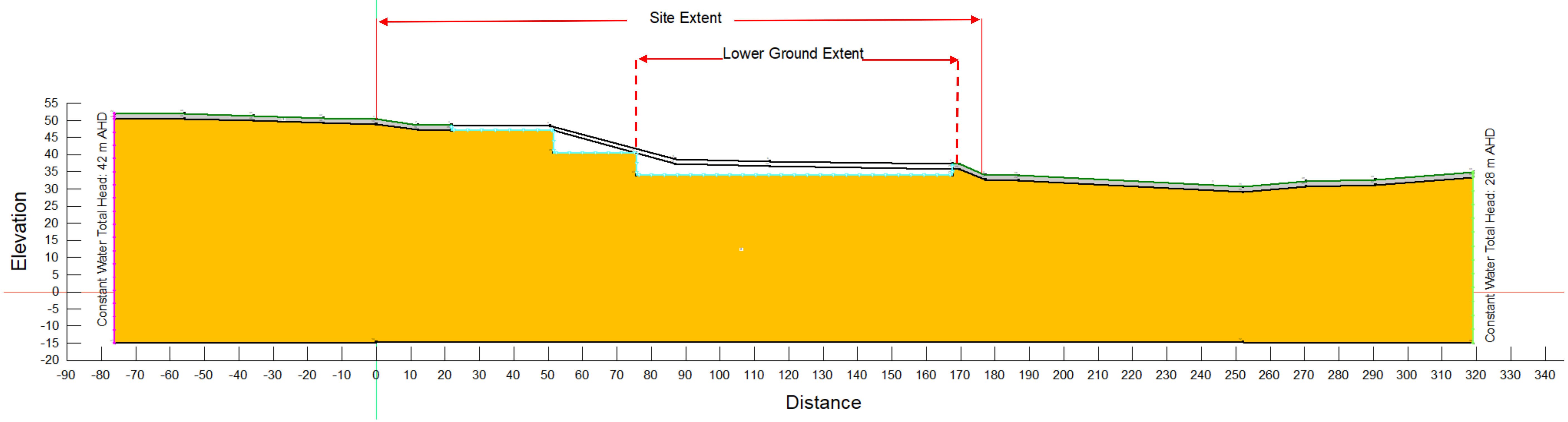
Goodman
12 Mars Road, Lane Cove West NSW
Groundwater Assessment
RUN 1 - CALIBRATION MODEL
WATER TOTAL HEAD RESULTS
PSM5568-010L — APPENDIX C2

PSM

Appendix D
SEEP/W Seepage Analysis – Runs 2 to 4 – Model Geometry and Results

Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (best estimate k = 1.0e-7)	Saturated Only	1e-07	0.2
	FILL/NATURAL (best estimate k = 1e-7)	Saturated Only	1e-07	0.2

Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m
	Potential Seepage Surface	Hydraulic	Water Flux	0 m/sec



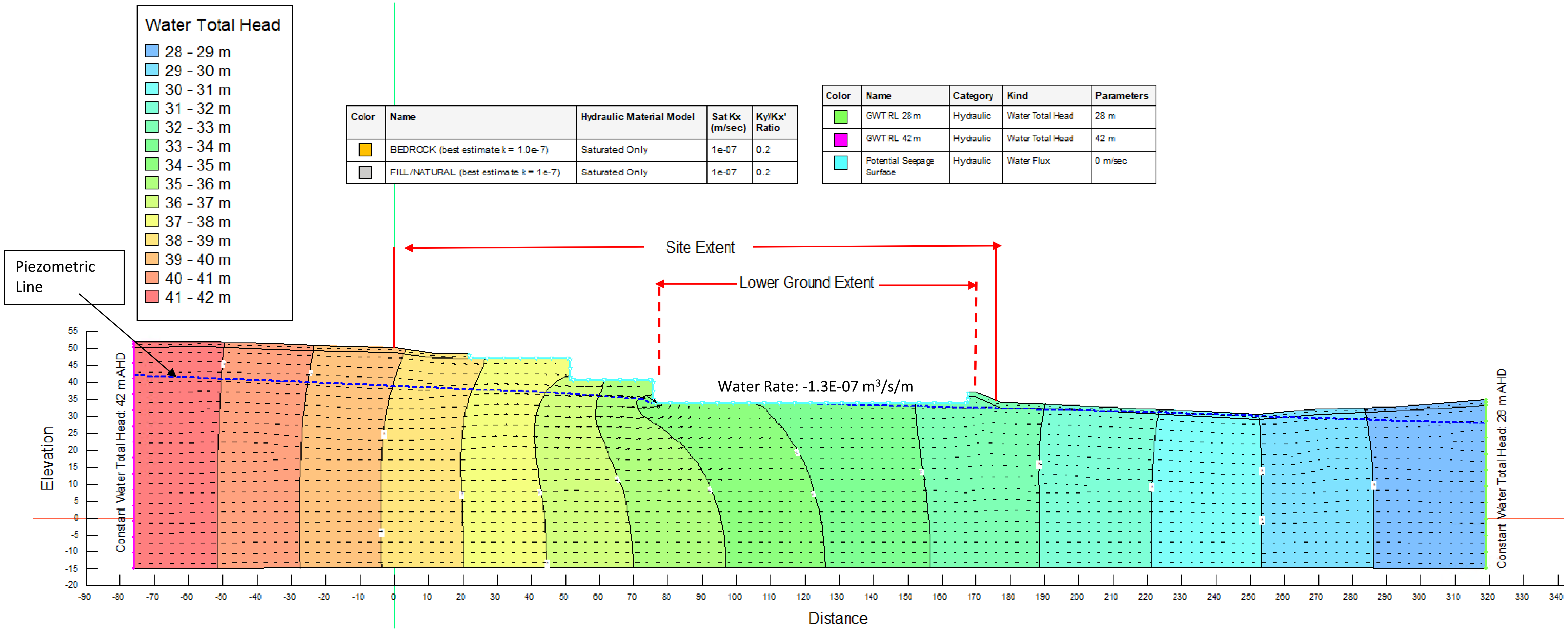
Notes:

1. All boundaries and locations are indicative and approximate.

Goodman 12 Mars Road, Lane Cove West NSW Groundwater Assessment RUN 2 - BEST ESTIMATE MODEL GEOMETRY	
PSM5568-010L	APPENDIX D1

Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (best estimate k = 1.0e-7)	Saturated Only	1e-07	0.2
	FILL/NATURAL (best estimate k = 1e-7)	Saturated Only	1e-07	0.2

Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m
	Potential Seepage Surface	Hydraulic	Water Flux	0 m/sec



Notes:

1. All boundaries and locations are indicative and approximate.

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12 Mars Road, Lane Cove West NSW

Groundwater Assessment

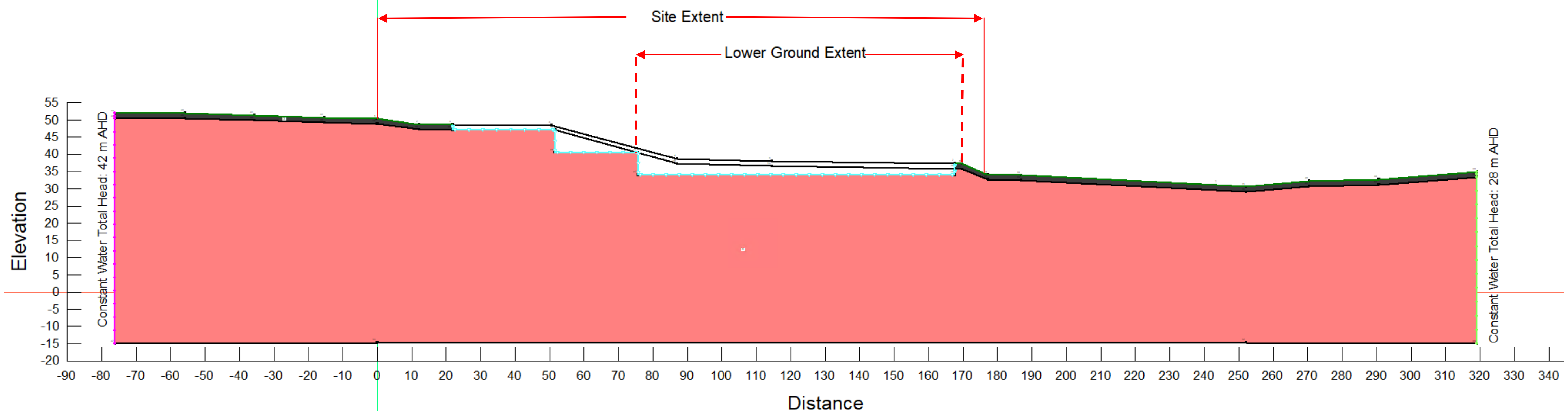
RUN 2 - BEST ESTIMATE

WATER TOTAL HEAD RESULTS

PSM5568-010L	APPENDIX D2

Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (upper bound k = 1.0e-6)	Saturated Only	1e-06	0.2
	FILL/NATURAL (upper bound k = 1e-6)	Saturated Only	1e-06	0.2

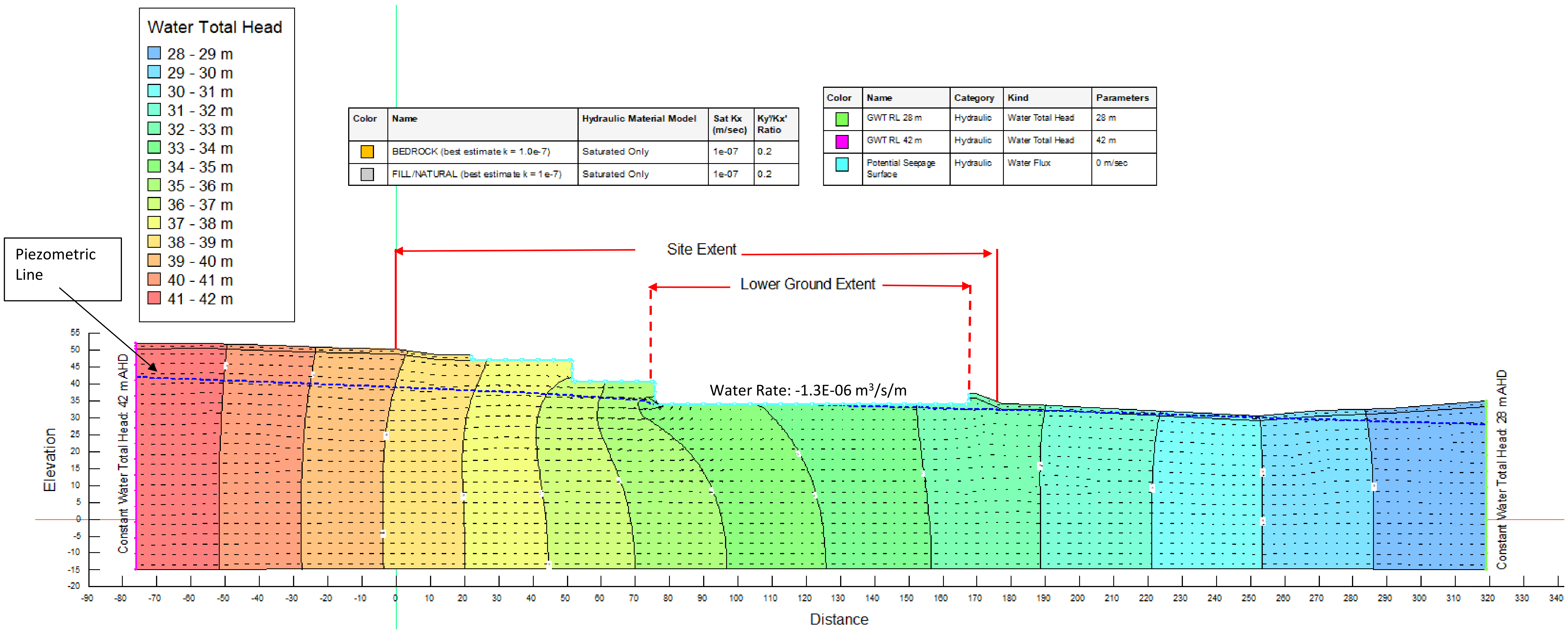
Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m
	Potential Seepage Surface	Hydraulic	Water Flux	0 m/sec



Notes:

1. All boundaries and locations are indicative and approximate.

Goodman 12 Mars Road, Lane Cove West NSW Groundwater Assessment RUN 3 - UPPER BOUND MODEL GEOMETRY	
PSM5568-010L	APPENDIX D3



Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (best estimate k = 1.0e-7)	Saturated Only	1e-07	0.2
	FILL/NATURAL (best estimate k = 1e-7)	Saturated Only	1e-07	0.2

Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m
	Potential Seepage Surface	Hydraulic	Water Flux	0 m/sec

Notes:

1. All boundaries and locations are indicative and approximate.

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12 Mars Road, Lane Cove West NSW

Groundwater Assessment

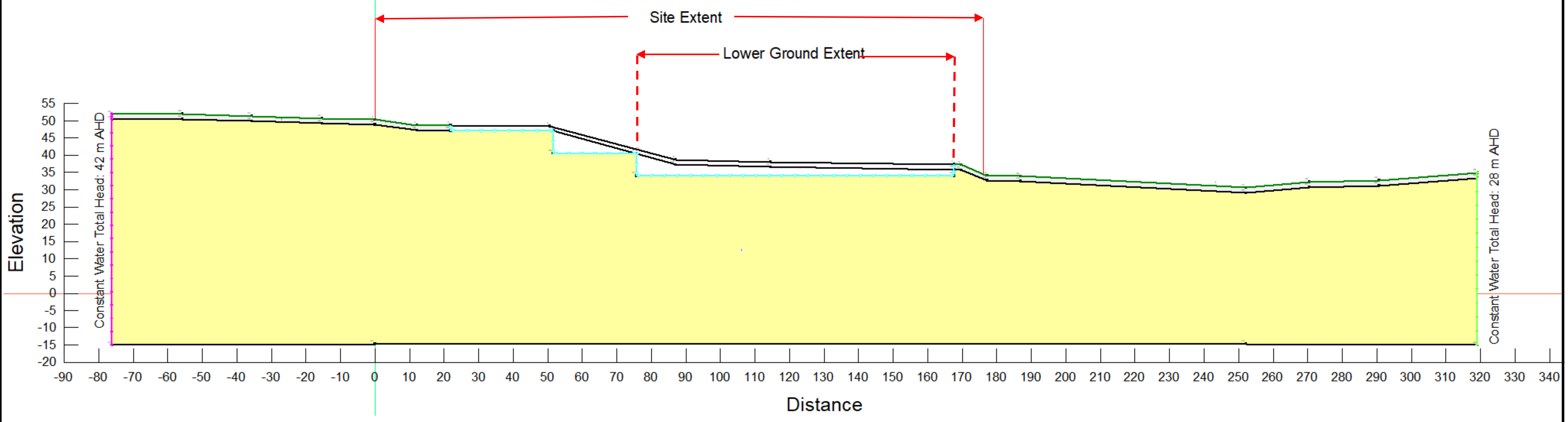
RUN 3 - UPPER BOUND

WATER TOTAL HEAD RESULTS

PSM5568-010L	APPENDIX D4

Color	Name	Hydraulic Material Model	Sat Kx (m/sec)	Ky'/Kx' Ratio
	BEDROCK (lower bound k = 1.0 e-8)	Saturated Only	1e-08	0.2
	FILL/NATURAL (lower bound k = 1e-8)	Saturated Only	1e-08	0.2

Color	Name	Category	Kind	Parameters
	GWT RL 28 m	Hydraulic	Water Total Head	28 m
	GWT RL 42 m	Hydraulic	Water Total Head	42 m
	Potential Seepage Surface	Hydraulic	Water Flux	0 m/sec



Notes:

1. All boundaries and locations are indicative and approximate.

Goodman 12 Mars Road, Lane Cove West NSW Groundwater Assessment RUN 4 - LOWER BOUND MODEL GEOMETRY	
PSM5568-010L	APPENDIX D5

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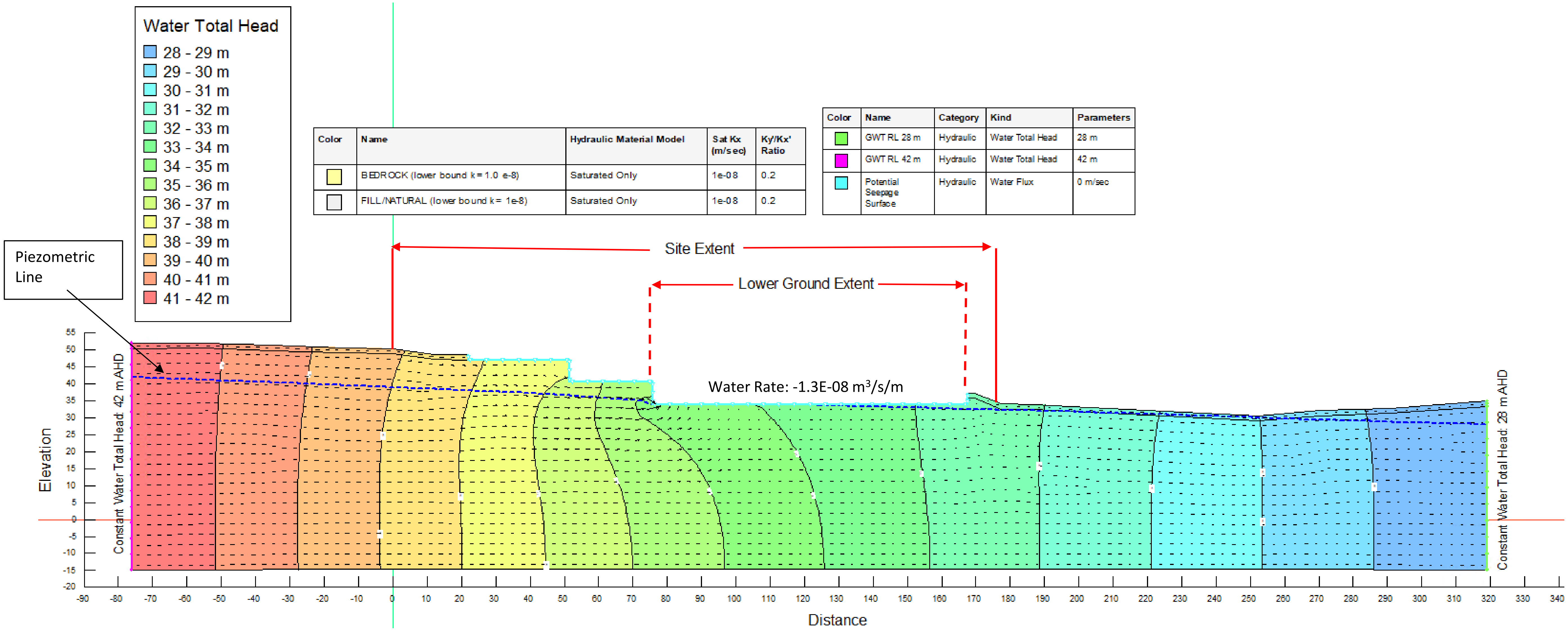

Notes:

1. All boundaries and locations are indicative and approximate.

Goodman 12 Mars Road, Lane Cove West NSW Groundwater Assessment RUN 4 - LOWER BOUND WATER TOTAL HEAD RESULTS	
PSM5568-010L	APPENDIX D6