Preliminary Groundwater impact assessment

Proposed Automated Distribution Centre (ADC)
475 Badgerys Creek Road, Bradfield
(Lots 102 and 105 DP1316278)

June 2026

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475 Badgerys Creek Road, Bradfield
(Lots 102 and 105 DP1316278)

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WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Abbreviations

ADC	Automated Distribution Centre
AHD	Australian Height Datum
AIP	Aquifer Interference Policy
ANZG	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
EP&A Act	Environmental Planning and Assessment Act 1979
GDE	Groundwater Dependent Ecosystem
HEVAE	High Ecological Value Aquatic Ecosystems
K	Hydraulic Conductivity
mbgl	Metres Below Ground Level
mAHD	Metres Australian Height Datum
NGIS	National Groundwater Information System
NSW	New South Wales
SEARs	Secretary's Environmental Assessment Requirements
WAL	Water Access Licence
WM Act	Water Management Act 2000
WSP	WSP Australia Pty Limited

Executive summary

This report presents a groundwater impact assessment for the proposed Automated Distribution Centre (ADC) prepared to support the State Significant Development application for the Client at 475 Badgerys Creek Road, Bradfield, NSW.

The assessment was undertaken using a combination of desktop review and site-specific hydrogeological investigation, including groundwater monitoring, slug testing and groundwater quality sampling.

The site is underlain by low permeability silty clay and weathered siltstone associated with the Bringelly Shale formation, with groundwater occurring as shallow, low-yield seepage or perched water within alluvial and weathered materials. Hydraulic conductivity values derived from slug testing range from approximately 10^{-7} to 10^{-5} m/s, indicating generally low permeability conditions.

Groundwater was encountered at depths of approximately 3 to 5 m below ground level, noting some variability across the site and limited monitoring duration.

No registered groundwater supply bores were identified within the study area.

Sensitive receivers identified within the study area include:

- A small and localised area of high-potential groundwater dependent ecosystems (GDEs) located along the north-eastern boundary of the site
- More extensive GDEs located outside the site, primarily associated with drainage features and alluvial areas

The identified GDEs are based on the BoM GDE Atlas, which represents a screening-level dataset, and are not classified as high priority under the NSW HEVAE framework. These ecosystems are likely supported by soil moisture and shallow subsurface conditions, rather than reliance on regional groundwater systems.
Construction activities involving excavation to depths of up to approximately 7 m below ground level may locally intercept shallow groundwater; however, any groundwater inflows are expected to be minor, localised and temporary due to the low permeability subsurface conditions.

Operational impacts are expected to be negligible, with only minor localised changes to groundwater recharge and flow associated with the introduction of hardstand and built infrastructure.

Overall, potential impacts to groundwater levels, flow and quality are expected to be negligible to minor, and are not anticipated to result in measurable impacts to surrounding receivers, including mapped GDEs.

The assessment demonstrates that the proposal complies with the NSW Aquifer Interference Policy (AIP) Level 1 minimal impact considerations, indicating that the development will result in no more than minimal harm to groundwater resources.

This report is issued as a preliminary groundwater impact assessment and is subject to update following the availability of additional groundwater monitoring data.

1 Introduction

1.1 Background

For the purposes of this report, the project proponent is referred to as "the Client". The client is preparing a State Significant Development Application (SSDA) for the construction, fit-out and operation of a warehouse or distribution facility, referred to throughout this report as an Automated Distribution Centre (ADC), at 475 Badgerys Creek Road, Bradfield. The land is legally described as part Lot 102 and Lot 105 in DP 1316278. The ADC is proposed to be located on future Lots 208, 209 and 210 within the broader landholding, with the approximate site boundary shown in Figure 1-1.

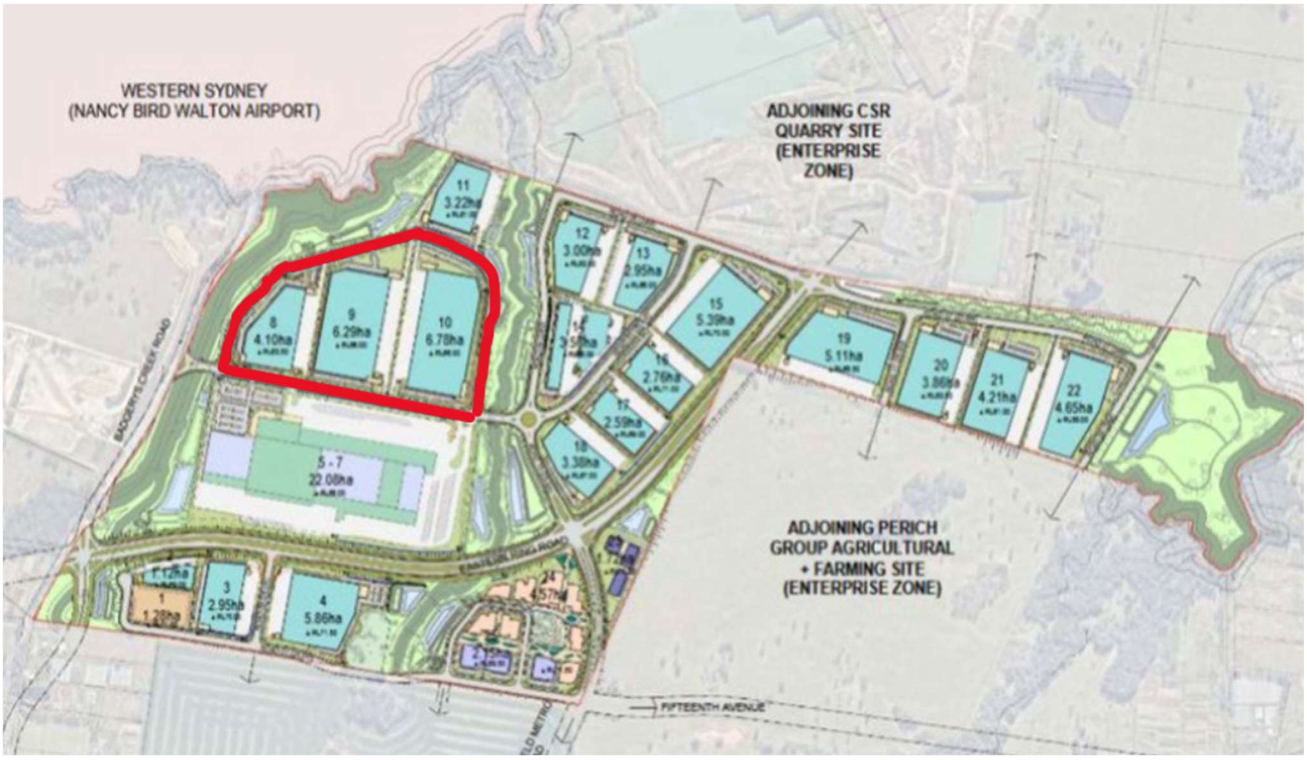


Figure 1-1 ADC Approximate Lot Boundary

The proposed development will have an approximate footprint of 67,600 square metres within a broader site area of approximately 171,682 square metres. The total warehouse floor area is approximately 202,800 square metres, including robotic storage levels.

The development will include a multi-level warehouse structure, loading docks, internal roads, car parking and associated civil infrastructure.

Based on the available project information, bulk earthworks will be undertaken by others as part of the broader estate development. These works are expected to include up to approximately 5 metres of excavation and up to approximately 2 metres of fill, followed by a further excavation of approximately 2 metres during construction, resulting in a total potential excavation depth of approximately 7 metres below the existing ground level (WSP, 2026).

These works have the potential to interact with subsurface conditions and groundwater where encountered, particularly in lower-lying areas and in proximity to drainage features. Accordingly, a groundwater impacts assessment is required to support the development and inform design and construction considerations.

1.2 Purpose of this report

This report presents a groundwater impact assessment for the proposed development and has been prepared to support project approvals and design.

The objectives of this report are to:

- describe the existing hydrogeological environment at the site
- assess potential impacts to groundwater levels and quality during construction and operation
- identify potential sensitive receivers, including groundwater users and groundwater dependent ecosystems (GDEs)
- assess potential impacts in the context of the NSW Aquifer Interference Policy (AIP)
- provide mitigation and management measures where required

This groundwater impact assessment addresses the relevant groundwater SEARs for the Project. The relevant requirements for groundwater were provided in section 12 of the SEARs and are detailed in Table 1-1. Where SEARs are not directly addressed in this report, they are addressed through other technical inputs prepared for the Project.

This report is issued as a preliminary assessment and will be updated following the availability of additional groundwater monitoring data.

Table 1-1 SEARs relevant to groundwater

Key issue number and description	Issue and assessment requirements	How it is addressed	Location within this report
Water Management	An assessment of potential surface and groundwater impacts (both quality and quantity) associated with the development, including potential impacts on watercourses, riparian areas, waterfront land, groundwater, and groundwater dependent communities nearby in accordance with relevant water quality guidelines and the NSW DCCEEW-Water Groundwater Toolkit	The groundwater component was addressed through desktop review and site-specific investigation, and by assessing potential impacts against the minimum impact considerations outlined in the Aquifer Interference Policy (AIP) Section 2.4	Section 4 (Existing environment), Section 5 (Impact assessment), Section 6 (Mitigation) Note that potential surface water impacts including potential impacts on watercourses, riparian areas, waterfront land are discussed in other reports. Groundwater dependent communities are discussed, however more details are provided in other reports.
	Details of any surface or groundwater mitigation, management and monitoring activities and methodologies	Mitigation measures are discussed	Section 5 and Section 6 Note that potential surface water mitigation, management and monitoring activities and methodologies are discussed in other reports.

1.3 Groundwater study area

To adequately characterise the hydrogeological conditions relevant to the site (site boundary shown in red), a regional scale understanding is required. Groundwater regimes are complex and can be influenced by broad geographical and regional scales. The selected groundwater study area encompasses a 500 metre wide buffer (black boundary) around the site boundary as shown in Figure 1-2. The study area was selected to incorporate the site's potential area of influence on groundwater and its impact to sensitive receivers such as registered groundwater bores and groundwater dependent ecosystems (GDEs).

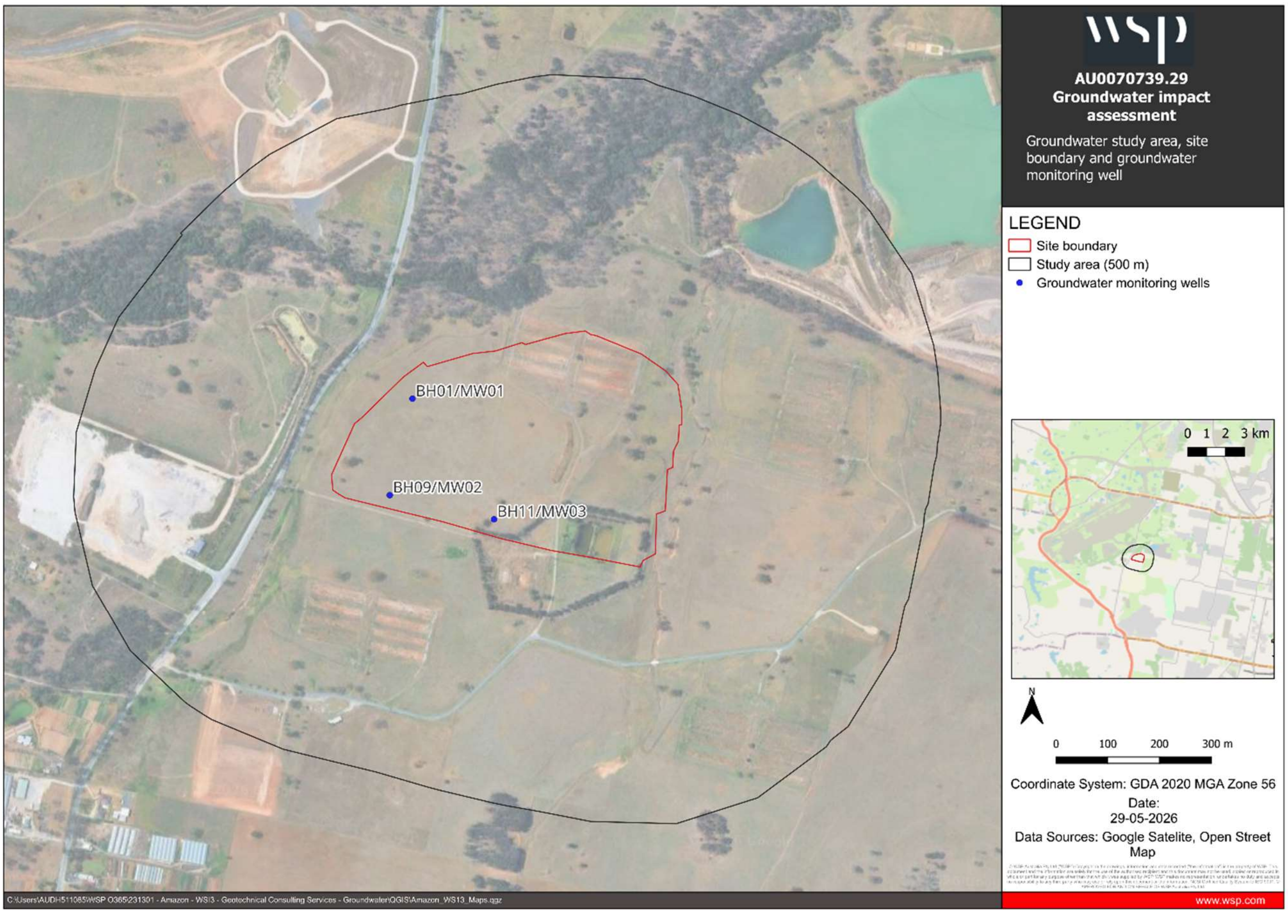


Figure 1-2 Groundwater study area, site boundary and groundwater monitoring wells

2 Legislation and policies

2.1 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) and Environmental Planning and Assessment Regulation 2000 establish the framework for the assessment and approval of development in New South Wales. They also provide for the making of environmental planning instruments, including State environmental planning policies (SEPPs) and local environmental plans (LEPs), which determine the permissibility of development and applicable approval pathways.

The WSI3 Automated Distribution Centre (SSD-105499958) is classified as State significant development (SSD). SSD is assessed under Part 4, Division 4.7 of the EP&A Act. Under this framework, a development application for SSD must be accompanied by an Environmental Impact Statement (EIS), prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs). The EIS provides a comprehensive assessment of the environmental, social and economic impacts of the project to inform decision-making.

2.2 Water Management Act 2000

Water resources in the groundwater study area are administered under the *Water Management Act 2000* by the NSW Department of Planning, Industry and Environment (DPIE, 2021). The objective of the *Water Management Act 2000* is the sustainable and integrated management of the state's water sources for the benefit of present and future generations. The *Water Management Act 2000* governs the issue of water access licences (WALs) and approvals for those water sources (rivers, lakes, estuaries and groundwater) in NSW where water sharing plans have commenced. Water sharing plans establish rules for sharing water between water users and the environment, and areas rules for water trading.

Typically, if a project extracts ('takes') groundwater directly, such as from groundwater pumping bores, or inadvertently, such as due to excavations intercepting groundwater, the following approvals or licences under the *Water Management Act 2000* would be required:

- water use approval under section 89
- water supply work approval (WSWA) under section 90 (falls under a water management work approval)
- WAL with sufficient entitlement volume in the relevant water source to cover groundwater take under Section 91.

Under Section 91 of the WM Act a controlled activity approval is required for certain types of developments and activities that have the potential to affect water quality that are carried out at a specified location in, on or under waterfront land.

Potentially relevant WM Act approval requirements are reviewed in Table 2-1.

Table 2-1 Water management act approvals

Provision	Application
Water use approval (s.89 & s.91A)	A water use approval may be required if groundwater is intercepted during construction activities. Given the limited and temporary nature of potential groundwater inflows, licensing requirements would be assessed in accordance with the Water Management Act 2000.
Water supply work approval (s.90)	Water supply works are generally not proposed for water supply purposes; however, temporary approvals may be required to facilitate construction dewatering. Limited and conditional exemptions from water licensing and approval requirements are

	provided under Section 39 and Schedule 1 of the Water Management (General) Regulation 2025, including for certain emergency or low-risk dewatering activities. Where exemptions do not apply, appropriate water supply works approvals and associated regulatory requirements would be obtained.

Water sharing plans set rules for sharing water between water users and the environmental needs of the river or aquifer, and between different types of water use such as rural domestic supply, stock watering, industry, irrigation, and town supply. Water sharing plans bring water users into a single licensing system managed under the WM Act.

It is not anticipated that the construction or operation of the proposal would impact water sharing plans.

2.3 Water sharing plans and groundwater sources

Water sharing plans have been developed for groundwater sources across NSW. These plans protect the health of our rivers and aquifers while also providing water users with perpetual access licences, equitable conditions and increased opportunities to trade water through separation of land and water. Water sharing plans describe the annual groundwater recharge volumes for each identified groundwater source and the volumes of water that are available for sharing. Provisions are made for environmental water allocations, basic landholder rights, and native title rights. The purpose of a water sharing plan is to:

- provide water users with a clear picture of when and how water would be available for extraction.
- protect the fundamental environmental health of the water source.
- ensure the water source is sustainable in the long-term.

Groundwater sources are identified within each water sharing plan that defines a long-term average annual extraction limit for each source. The volume of water a licence holder can extract each year is set by the entitlement held by the user, water account rules in the water sharing plan. It is by these groundwater sources that allocation and management of the groundwater resource is determined. Management zones are sub areas within a groundwater source which may have specific rules regarding management of extraction volumes or environmental protection.

The water sharing plan covering the groundwater study area is the “Greater Metropolitan Region Groundwater Sources”. The source directly relevant to the groundwater study area is the Sydney Basin Central Groundwater Source. Groundwater throughout the groundwater study area is characterised as less productive (DPI, 2013), and exists in alluvial, porous and fractured rock aquifers.

2.4 NSW Aquifer Interference Policy

The *NSW Aquifer Interference Policy* (AIP) was introduced in September 2012 (NSW Department of Primary Industries (DPI), 2012) and forms part of the NSW ‘Strategic Regional Land Use Policy’. The AIP clarifies the requirements for obtaining water licences and the assessment processes for aquifer interference activities under the WM Act and other relevant legislative frameworks. The WM Act includes the concept of ensuring ‘no more than minimal harm’ for both the granting of water access licences and the granting of approvals. The AIP also defines minimal impact considerations in assessing whether more than minimal impacts might occur to a key water-dependent asset.

For aquifer impact assessments, the AIP provides a framework for assessing the impacts of aquifer interference activities on groundwater resources. To assess potential impacts, groundwater sources are characterised as either ‘highly productive’ or ‘less productive’ (DPI, 2013) with sub-categories for alluvial, coastal sands, porous rock, and fractured rock aquifers. Highly productive groundwater areas are characterised by bores having yield rates greater than 5 L/s and total dissolved solids (TDS) of less than 1,500 mg/L (DPI, 2013). Where an aquifer fails to meet the criteria, it is classified as less productive. The AIP refers to the beneficial use of an aquifer, which is outlined in the NWQMS (Australian Government, 2013); it is noted that within the management strategy, the term beneficial use is replaced with environmental value.

The AIP forms the basis of assessment and subsequent advice provided by the NSW Government at the various stages of an assessment under the *Environmental Planning and Assessment Act 1997*. The WM Act defines an aquifer interference activity as that which involves any of the following:

- the penetration of an aquifer
- the interference with groundwater in an aquifer
- changes or obstructs groundwater flow in an aquifer
- the taking of water from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations
- the disposal of water taken from an aquifer in the course of carrying out mining or any other activity prescribed by the regulations.

The productivity of the groundwater sources near the study area is outlined in Table 2-2

Table 2-2 Groundwater source productivity

Groundwater source	Category	Productivity
Sydney Basin Central Groundwater Source	Porous and fractured rock	Less productive

2.5 Groundwater Assessment Toolbox for Major Projects in NSW

The *Groundwater Assessment Toolbox for Major Projects in NSW* (DPIE, 2022) provides a risk-based framework used by NSW regulators to guide groundwater impact assessments for State Significant Development. Its purpose is to ensure that the level of investigation is proportionate to the scale and risk of groundwater interaction, allowing projects with limited excavation below the water table to be assessed using simplified methods where detailed modelling is not required.

The framework supports identification of potential groundwater interactions, assessment of impacts against the NSW Aquifer Interference Policy (AIP), and determination of appropriate investigation and assessment requirements.

2.6 Groundwater Dependent Ecosystems Policy

GDEs are defined as 'ecosystems that need access to groundwater to meet all or some of their water requirements to maintain their communities of plants and animals, ecological processes, and ecosystem services'. The *NSW State Groundwater Dependent Ecosystems Policy* (GDE Policy) (Department of Land and Water Conservation (DLWC), 2002) provides guidelines on how to protect and manage GDEs. Ongoing work seeks to improve understanding of the location of these ecosystems and determine the extent of their reliance on groundwater and provide legislative frameworks that safeguard the ecosystem. The GDE Policy is designed to protect and maintain the processes and biodiversity of valuable ecosystems which rely on groundwater for survival.

2.7 Guidelines for Groundwater Quality Protection in Australia

The *Guidelines for Groundwater Quality Protection in Australia* (Australian Government, 2013) support a national approach to groundwater quality protection and are designed to support the National Water Quality Management Strategy (NWQMS). The framework provides guidance to develop groundwater protection plans, which include assigning an environmental value category to a groundwater system, setting WQOs and developing management strategies that are tailored to individual groundwater protection scenarios.

3 Methodology

3.1.1 Overview

The groundwater impact assessment identified the potential impacts of the proposal on groundwater systems and groundwater-dependent receivers. Direct impacts associated with aquifer interference activities and construction works include changes to groundwater levels, hydraulic gradients, flow pathways and water quality, as well as modification of aquifer properties (e.g. permeability and connectivity).

To understand the hydrogeological (groundwater) environment within the groundwater study area, the groundwater assessment included the following key steps:

- reviewing publicly available data, reports and existing studies to develop an understanding of the existing groundwater environment within the groundwater study area
- reviewing data from field investigations
- identifying risks to sensitive receivers, including GDEs and groundwater users.
- assessing the potential impacts to sensitive receivers from construction and operation of the proposal.
- identifying potential safeguards and management measures to avoid, mitigate and manage any potential impacts of the proposal to groundwater.

3.1.2 Desktop review

A desktop review of publicly available data was completed to develop an understanding of the hydrogeological environment within the groundwater study area. The review included an assessment of the groundwater environment of the study area and identifying sensitive groundwater receivers, GDEs and registered groundwater bores.

Information reviewed, included:

- legislation and policy relevant to groundwater including the WM Act, relevant water sharing plans, and the NSW AIP
- desktop review of existing studies, and publicly available data relevant to the study area
- geological data from NSW Seamless Geology (Colquhoun, et al. 2021)
- high potential GDE information from the Bureau of Meteorology's (BoMs) Groundwater Dependent Ecosystems Atlas (GDE Atlas) (BoM 2026) and the NSW GDE Ecological Value (HEVAE) spatial database (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2026)
- registered groundwater bore data including groundwater levels, quality and yield, from WaterNSW real-time water data website (WaterNSW, 2026).

3.1.3 Field investigations

Field investigations were undertaken to characterise groundwater conditions at the site, including installation, development, monitoring, and testing of groundwater wells. These activities provide data on groundwater levels, hydraulic properties, and quality to inform the impact assessment.

3.1.3.1 Groundwater well installation

Three groundwater wells were installed to facilitate groundwater monitoring and to inform groundwater level fluctuations at the site. Groundwater wells were installed at depths of up to 5 mbgl, constructed with 50 mm uPVC casing, including a 0.4 mm machine-slotted 3 m long screen at the base, followed by blank casing extending above ground level (stick-up). Boreholes were backfilled with 2 mm filter sand and sealed with a bentonite pellet plug. Well construction details are provided in the monitoring well installation logs in Appendix A**.**

3.1.3.2 Groundwater well development

The groundwater monitoring wells were developed on 18 May 2026 in accordance with the recommendations outlined in AS/NZS 5667.11:1998 "Water Quality – Sampling" and "Minimum construction requirements for water bores in Australia" (NUDLC, 2012). Development included the purging of water and water entrained sediment (if present) and drilling mud from individual wells using a single-use high-density polyethylene (HDPE) bailers.

Development of all groundwater monitoring wells continued until the following conditions were met:

- between 3 and 10 well volumes were removed
- three consecutive stabilised readings of field quality parameters were recorded more than half a well volume apart
- the well became dry during development (low-yield wells)

As development continued, measurements of pH, electrical conductivity, oxidation reduction potential (ORP), temperature and dissolved oxygen were also measured using a multi-parameter field meter. These measurements, along with the volume of water purged and the general description of the visual and olfactory condition of the purged water, were recorded on a dedicated monitoring well development record for each well. A copy of the well development field records is provided in Appendix B**.**

3.1.3.3 Groundwater level monitoring

Groundwater levels were measured throughout the monitoring program from 5 to 22 May 2026 using two methods:

- manually using an electric water 'dipper' meter, and
- automated continuous water level monitoring using water-pressure transducers and data loggers (known as 'water level loggers') installed in each of the groundwater monitoring wells. The automated continuous water level monitoring was carried out using non vented level loggers. A barometric logger was used for monitoring atmospheric changes.

3.1.3.4 Hydraulic conductivity testing

Hydraulic 'slug' testing was carried out on 22 May 2026 in the three groundwater monitoring wells installed at site to provide estimates of hydraulic conductivity (K). The testing comprised rising head tests only in the monitoring wells, due to insufficient standing water to undertake falling head tests.

For rising head tests, the well was purged dry using a bailer (approximately 1 m water column removed) due to insufficient standing water within the well. The subsequent recovery of the water level (rising head) was then monitored using a level logger and allowed to return towards its pre-test elevation (typically up to approximately 90%). Changes in the water level were recorded over time and used to interpret hydraulic properties based on recovery behaviour.

3.1.3.5 Groundwater quality monitoring

Groundwater quality samples were collected from three monitoring wells (BH01/MW01, BH09/MW02 and BH11/MW03) on 19 May 2026.

Samples were collected using dedicated disposable bailers for each of the wells, whilst measurements of pH, electrical conductivity, redox potential and temperature were measured during sampling using a calibrated water quality meter.

Groundwater samples were stored in containers provided by the laboratory. The containers were filled, sealed, and labelled with the job number, date, and location identifier.

Samples for dissolved heavy metals analysis were filtered through a 0.45 µm filter and then placed within the appropriate sample acid-preserved containers provided by the laboratory. The containers were placed in an insulated cool box in which ice was added to maintain the samples at a temperature of 4°C or less.

Samples were taken directly by field staff to the ALS Environmental (NATA-accredited) and analysed for the parameters listed in Table 3-1 .

Table 3-1 Analytical schedule for groundwater quality sampling

Parameter	Method
Physical parameters (temperature, electrical conductivity, pH, dissolved oxygen, redox potential)	Field
8 metals (Total): As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Laboratory
Additional Total Metal by ICP/MS: Fe	Laboratory
TRH (C6–C40), BTEXN, PAH, 8 metals (Dissolved): As, Cd, Cr, Cu, Ni, Pb, Zn, Hg	Laboratory
Additional Dissolved Metals by ICP/MS: Fe	Laboratory
PFAS: Full suite (31 analytes)	Laboratory
Total Nitrogen, NO_2, NO_3, NH_3, Total Phosphorus, Reactive Phosphorus	Laboratory
Ca, Mg, Na, K, Cl, SO_4, Alkalinity	Laboratory
Total dissolved solids	Laboratory
Sodium Adsorption Ratio (SAR)	Laboratory
Water on steel & concrete piles) AS2519-2009): pH, Cl, SO4, Mg, fixed ammonia, lime dissolving carbonic acid	Laboratory

3.1.4 Impact assessment

An impact assessment was conducted through the identification of potential impacts to groundwater, and groundwater users during the construction and operation of the proposal, including consideration of the planned proposal's impacts on groundwater in light of relevant legislation, policy and guidelines (including the NSW AIP) in section 5. Details of groundwater mitigation, management and monitoring activities and methodologies are provided in section 6.

4 Existing environment

4.1 Site description and topography

The site is located within a predominantly rural setting characterised by open grassland, scattered vegetation and localised areas of denser tree cover. The site is currently undeveloped and accessed via unsealed tracks and adjoining local roads.

The site lies within a low-lying floodplain associated with a meandering drainage line (identified on mapping as Badgerys Creek), which traverses the immediate vicinity. The surrounding terrain is generally flat to gently undulating, with vegetated riparian corridors adjacent to the creek and cleared land used for agricultural purposes.

A mapped drainage line occurs along the western and southern extents of the site, with adjacent localised low-lying areas. This drainage feature indicates potential for periodic surface water flow and localised inundation or soil saturation during rainfall events.

Surveyed reduced levels (RLs) across the site range from approximately:

- RL 61.8 m (lowest recorded)
- RL 72.0 m (highest recorded)

The highest levels are generally located toward the southern to south-eastern part of the site (as indicated by BH11/MW03 at RL 71.97 m), while lower elevations are recorded toward the north-western part of the site (e.g. BH01/MW01 at RL 61.87 m and TP07 at RL 61.84 m). (WSP, 2026). This indicates an overall gentle to moderate slope across the site, with an elevation difference of approximately 10 m across the investigation area.

4.2 Climate and rainfall

Climate data for the study area was obtained from the Bureau of Meteorology (BoM) station at Bringelly (Maryland) (Station No. 067015), located approximately 3.2 km from the project site at an elevation of 122 mAHD. The station has a long-term record commencing in 1867 and remains operational, providing a reliable dataset for assessing local climatic conditions.

Analysis of long-term rainfall data indicates a mean annual rainfall of approximately 770–800 mm, with rainfall distributed throughout the year but showing seasonal variation. Higher rainfall typically occurs during the late summer and autumn months (January to April), corresponding to the wetter period, while comparatively lower rainfall is recorded during winter and early spring (June to September), representing the drier period.

Table 4-1 Summary of rainfall statistics for Bringelly (Maryland) BoM Station (No. 067015)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean Rainfall (mm)	82.5	87.2	84.8	68.3	61.8	64.3	47.6	41.5	43.1	55.0	67.4	63.6
Median Rainfall (mm)	66.3	63.6	63.6	48.7	37.6	40.6	29.9	24.1	36.5	44.5	55.4	49.4
Highest Daily Rainfall (mm)	132.6	172.0	128.0	156.0	148.3	136.8	172.7	99.3	118.9	108.0	203.2	101.6

This seasonal distribution of rainfall suggests that groundwater recharge is likely to be more significant during the wetter months, particularly following prolonged rainfall events, while recharge is reduced during the drier winter and early spring period.

4.3 Regional geology

Based on the available geological mapping, the site is primarily underlain by Bringelly Shale, a unit of the Wianamatta Group, which typically comprises shale, claystone, laminite and occasional sandstone layers. This formation is expected to weather to stiff to very stiff clay soils at shallow depths, transitioning to extremely weathered to fresh rock with depth.

The geological map indicates that the central and northern portions of the site are underlain by Bringelly Shale. However, the southern portion and areas adjacent to the creek corridor are mapped as Quaternary alluvial floodplain deposits. These deposits are typically associated with recent fluvial processes and are expected to comprise variable layers of clay, silt, sand and occasional gravel, with potentially soft, compressible and moisture-sensitive characteristics.

The presence of the mapped creek corridor immediately west of the site suggests that localised alluvial influence and potential lateral variability in subsurface conditions may extend into the site, particularly towards the southwestern boundary.

The main geological units identified across the project extent are presented in Figure 4-1 and are described as follows:

- Q_af (Denoted Qal on Penrith Geology Map) Alluvial Floodplain Deposits: Silt, very fine- to medium-grained lithic quartz-rich sand, clay
- Twib (Denoted Rwb on Penrith Geology Map) Bringelly Shale: Shale, carbonaceous claystone, laminite, lithic sandstone, rare coal

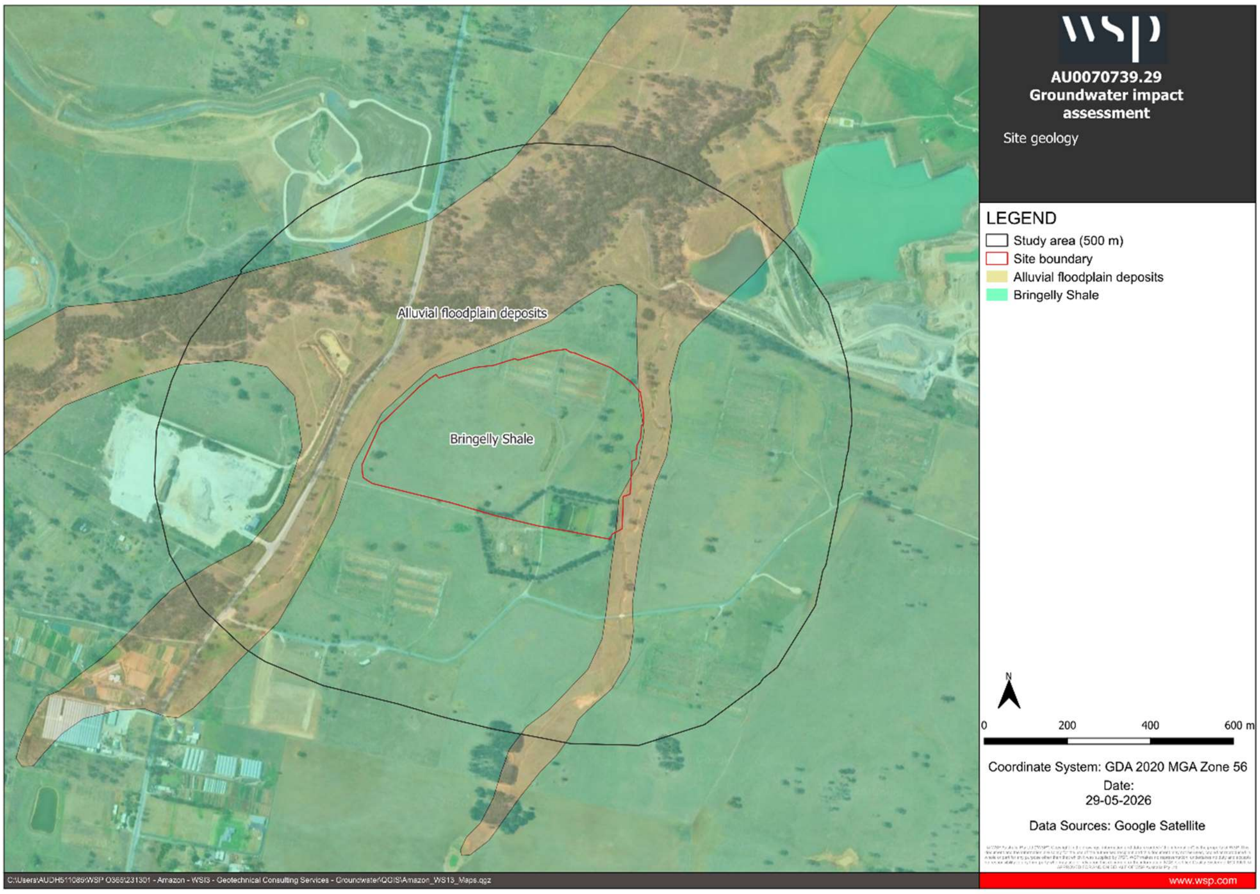


Figure 4-1 Site geology (Source: [Minview](), accessed 12/05/2026)

4.4 Hydrogeology

4.4.1 Hydrostratigraphic units

Groundwater at the study area is associated with shallow alluvial deposits and underlying bedrock units, reflecting the shale-dominated geology of the Sydney Basin. These units vary in thickness, extent and physical properties across the site and are consistent with the low-lying floodplain setting adjacent to the local drainage corridor. The principal hydrostratigraphic units encountered at the site are described in Table 4-2.

Table 4-2 Typical hydrostratigraphic units in the Western Sydney region

Hydrostratigraphic unit	Description
Alluvial floodplain deposits	Surficial unit associated with the creek corridor, typically up to ~3–4 mBGL. Comprises variable clay, silt and sand with minor gravel. Laterally variable and associated with floodplain processes.
Weathered Bringelly Shale	Weathered horizon of the underlying shale, typically encountered from ~3–5 mBGL. Comprises highly weathered claystone and siltstone with low permeability.
Bringelly Shale	Regional bedrock unit consisting of claystone and siltstone. Occurs below the weathered zone and is characterised by very low permeability.

4.4.2 Groundwater levels

Monitoring network

Three groundwater wells were installed to facilitate groundwater monitoring and to inform the understanding of groundwater level conditions at the site. A summary of groundwater well installations is presented in Table 4-3. Groundwater well construction logs are presented in Appendix A. The locations of the monitoring wells are shown on Figure 1-2.

Table 4-3 Summary of groundwater monitoring well installations

Borehole ID	Coordinates (MGA2020-56)[1]		Surface elevation (mAHD)[2]	Well height or recess (m)	Well headworks cover type	Well depth (mbgl)[3]	Screen interval (mbgl)	Screened lithology
	Easting	Northing						
BH01/MW01	290917.698	6246519.728	61.87	0.9	Monument	5.0	2.0 – 5.0	Silty clay and Siltstone
BH09/MW02	290882.916	6246342.379	65.52	1.2	Monument	5.0	2.0 – 5.0	Silty clay and Siltstone
BH11/MW03	291086.550	6246306.722	71.97	1.2	Monument	5.0	2.0 – 5.0	Silty clay and Siltstone

Note

(1) Coordinates and surface elevation data were sourced from the Geotechnical Interpretative Report (WSP, 2026).

(1) metres Australian height datum

(2) mbgl

Manual water level measurements

Manual measurements of groundwater levels were collected during the site investigation between 5 and 22 May 2026 using a dipper after well installation, during groundwater well development, prior to hydraulic ('slug') testing, and groundwater sampling. This data was collected to check the validity of groundwater levels estimated from data of the water pressure transducers and data loggers. Table 4-4 presents the recorded manual groundwater levels.

Automated continuous water level monitoring

Automated groundwater level monitoring was undertaken in three monitoring wells between 18 and 22 May 2026 using Rugged Troll 100 pressure transducers installed and managed by WSP. The loggers were configured to record water pressure and temperature at hourly intervals. Continuous monitoring commenced on 18 May 2026 at BH01/MW01, BH09/MW02 and BH11/MW03. Data collected during this period were downloaded on 22 May 2026 and used to develop preliminary groundwater hydrographs.

It is noted that the monitoring period was limited to approximately four days. During this time, multiple field activities (e.g. well installation, development, and sampling) were undertaken, which likely disturbed groundwater conditions and resulted in purging of water from the wells. As such, groundwater levels did not stabilise to equilibrium conditions, and the monitoring data are considered of limited usefulness at this early stage for interpretation of natural groundwater conditions.

The data loggers remain installed within the monitoring wells and continue to record groundwater levels at the time of reporting. A longer monitoring period is expected to capture more representative groundwater conditions. Updated hydrographs will be developed following the next data download to illustrate groundwater level fluctuations, including responses to rainfall.

Table 4-4 Manual groundwater level measurements (5 May 2026 to 22 May 2026)

Borehole ID	Total depth (mbgl[7])	Groundwater level (mbgl[1])				Groundwater level (mAHD[2])			
		Well installation[3]	Prior to well development[4]	Prior to groundwater sampling[5]	Prior to groundwater slug test[6]	Well installation[3]	Prior to well development[4]	Prior to groundwater sampling[6]	Prior to groundwater slug test[5]
BH01/MW01	4.93	Not observed	2.59	4.29	3.76	Not observed	59.29	57.59	58.12
BH09/MW02	4.13	1.1	3.70	4.02	4.29	64.42	61.82	61.50	61.23
BH11/MW03	4.81	1.5	4.11	4.67	4.78	70.47	67.86	67.31	67.20

Notes

(1) metres below ground level

(2) metres Australian height datum

(3) 5 to 7 May 2026

(4) 18 May 2026

(5) 19 May 2026

(6) 22 May 2026

(7) Total depth measured during the first field visit, during well development works

4.4.3 Hydraulic parameters

Estimates of horizontal hydraulic conductivity (Kh) for the key geological units intersected during the proposal works have been estimated from hydraulic (‘slug’) test results from all three groundwater monitoring wells on 22 May 2026.

Estimates of horizontal hydraulic conductivity (Kh) for the key geological units intersected during the proposal were determined using Aqtesolv™ analytical software, applying the KGS Model (1994) and Hvorslev, M.J. (1951) analytical solutions for unconfined aquifer conditions. The results are summarised in Table 4-5, with detailed test interpretations provided in Appendix C**.**

Table 4-5 Summary of ‘slug’ hydraulic conductivity test results

Monitoring well	Effective test interval (mbgl[1])		Test type[3]	Screened lithology	Horizontal hydraulic conductivity (m/sec)[2]	Horizontal hydraulic conductivity (m/sec)[2]
	From	To				
Solution used:					KGS Model	Hvorslev Model
BH01/MW01	2.0	5.0	RHT	Silty clay and Siltstone	1.9×10^{-5}	5.1×10^{-5}
BH09/MW02	2.0	5.0	RHT	Silty clay and Siltstone	2.4×10^{-7}	1.9×10^{-6}
BH11/MW03	Not enough water present in the well to perform a slug test.					

Notes: Due to insufficient water in the well, both rising head and falling head tests could not be performed. A rising head test was attempted.

(1) mbgl = metres below ground level

(2) metres per second

(3) RHT- rising-head (slug) test

4.4.4 Groundwater quality

Groundwater quality samples were collected from three monitoring wells (BH01/MW01, BH09/MW02 and BH11/MW03) on 19 May 2026 to characterise groundwater quality, geochemistry and potential contamination at the site. Results were compared against relevant guideline values to assess environmental and material durability risks.

The following water quality assessment criteria were adopted:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018), toxicant default guideline values for marine waters were adopted with the 95% level of species protection.
- PFAS National Environmental Management Plan (NEMP, 2025) freshwater and interim marine guideline values
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2026) default guideline values for PFOS (freshwater; noting that equivalent updated marine guideline values are not currently available)

Field parameters

Field parameters indicate saline, slightly acidic to near-neutral groundwater, with generally low dissolved oxygen and variable redox conditions across the monitoring wells. Dissolved oxygen concentrations were very low (0.07–0.09 mg/L), indicating poor oxygen availability and potentially reducing conditions. Oxidation–reduction potentials ranged from 110.6 mV to 443 mV, suggesting variable conditions from weakly reducing to oxidising.

Groundwater pH ranged from 6.23 to 6.62, indicating slightly acidic to near-neutral conditions.

Electrical conductivity varied significantly between wells (2,936 to 17,581 µS/cm), indicating variable to high salinity, with the highest salinity observed at BH01/MW01.

Laboratory analytical results

A summary of groundwater analytical results in relation to the above guidelines is presented below. Due to the muddy and thick consistency of groundwater at BH09-MW02, the laboratory could not proceed with alkalinity and ionic balance analysis. Due to low sample volume at BH11-MW03, as the well became dry during bailing, analysis could not be undertaken for alkalinity, ionic balance, ammonia, total dissolved solids, total petroleum hydrocarbons, PFAS, BTEXN and polycyclic aromatic hydrocarbons.

Overall, the groundwater was sodium–chloride dominated, with widespread exceedances of metal guideline values (notably lead, nickel and zinc) and some isolated detections of hydrocarbons at BH01 , while PFAS was absent and the groundwater held an exposure classification of non-aggressive to moderate. Copies of the analytical certificates for the groundwater samples collected from all three monitoring wells are included in **Appendix D**.

Groundwater analytical results summary:

- Major ions: Groundwater chemistry varied across wells but was consistently sodium–chloride dominant, with varying low to moderate salinity. Sodium (702–3,260 mg/L), chloride (923–6,200 mg/L), magnesium (77–648 mg/L) and calcium (34–99 mg/L) were highest at BH01-MW01.
- Nutrients: Nutrient concentrations were generally low but varied across the site. BH09-MW02 showed the highest TKN and nitrogen (total). Ammonia was generally low (0.01 and 0.30 mg/L) but had an exceedance of ANZG (2018) guideline values at BH09-MW02 (3.29 mg/L). Reactive phosphorus was below reporting limits at all wells while total phosphorus ranged low to high (0.17 – 111 mg/L), being particularly high at BH09-MW02.
- Total metals: Several metals showed elevated concentrations reflecting site-specific geochemical differences. Lead, nickel and zinc exceeded both freshwater and marine guideline values at all wells. Cadmium and copper exceeded freshwater guideline values at all wells. Comparison with guideline values was not possible where laboratory limits of reporting exceeded guideline criteria as for total mercury at BH09-MW02 and BH11-MW03. Arsenic and chromium were detected at all well locations and total iron was highly variable (up to 1,490 mg/L) but not assessed due to the absence of directly applicable groundwater guideline criteria for the reported analytes.
- Dissolved metals: Nickel and zinc exceeded both freshwater and marine guideline values at BH01-MW01. Cadmium and copper exceeded the freshwater guidelines at BH01-MW01 and possibly at BH11-MW03 although it is unclear at due to the LOR being higher than the guidelines at BH11-MW03. Comparison with guideline values was not possible where laboratory limits of reporting exceeded guideline criteria as for lead and zinc at BH11-MW03.
- Hydrocarbons: Total Hydrocarbons, Benzene and Toluene were detected at BH01-MW01 but not assessed due to the absence of directly applicable groundwater guideline criteria for the reported analytes. Otherwise, all hydrocarbons were not detected at BH01-MW01 and BH09-MW02 (TRH, BTEX and PAHs were all below reporting limits).
- PFAS: Not detected above laboratory reporting limits at BH01-MW01 and BH09-MW02.
- Corrosion classification: The exposure classification for concrete piles was mild to moderate. The exposure classification for steel piles indicates a non-aggressive to moderate exposure classification for infrastructure material.

4.4.5 Sensitive receivers

Sensitive groundwater receivers for the purpose of this assessment include:

- Registered bores are considered as water supply works as per the AIP, including household, stock and domestic, irrigation and commercial uses (registered bores that are for exploration and monitoring purposes are not considered as water supply works).

- Groundwater dependent ecosystems (GDEs) including those identified in the BoM Atlas (BoM, 2026) and NSW High Ecological Value Aquatic Ecosystems (HEVAE) dataset (Healey, 2018).
- Surface water that is connected to groundwater.

4.4.5.1 Registered bores

A search of the WaterNSW groundwater database (https://realtimedata.waternsw.com.au/) was conducted by WSP in May 2026. The search identified two exploration monitoring wells within a 500 m radius of the site. The wells are not classified as water supply bores. Groundwater level data is available for both bores and are presented in Table 4-6. The locations of these bores are shown on Figure 4-2

Table 4-6 Registered groundwater bores within approximately 500 m of the site

GW number	Easting[1]	Northing[1]	Use type	Groundwater level (mbgl)	Bore depth (mbgl)
GW112649	290253	6246317	Exploration	6.8	30.1
GW112650	290509	6246300	Exploration	8.5	30.7

Note: mbgl – metres below ground level.

(1) Coordinates relate to GDA94 Zone MGA56

4.4.5.2 Groundwater dependent ecosystems

Groundwater dependent ecosystems (GDEs) are defined as ecosystems that need access to groundwater to meet all or some of their water requirements to maintain their communities of plants and animals, ecological processes, and ecosystem services.

As the protection of GDEs in water sharing plans needs to be balanced with the demands of licensed water users, protection is generally focused on high and very high priority NSW High Ecological Value Aquatic Ecosystems (HEVAE) GDEs and those listed in the relevant water sharing plan (DPIE, 2024). As such, high priority GDE information described by DPIE (2018) is detailed below. Note, the AIP impact assessment does not include GDEs from the National GDE Atlas (also detailed below). The GDE Atlas was developed as a national dataset of Australian GDEs to inform groundwater planning and management.

A review of available datasets, including the BoM GDE Atlas (BoM, 2026) and NSW HEVAE dataset (Healey, 2018), was undertaken to identify GDEs within the study area.

Mapping from the BoM GDE Atlas indicates the presence of high to moderate potential terrestrial GDEs within and surrounding the study area. A small and localised area of high-potential GDE is present along the north-eastern boundary of the site and is associated with Cumberland Shale Plains Woodland vegetation. The majority of mapped GDEs are located outside the site, primarily to the west, south and south-west, where they are associated with drainage features and low-lying alluvial areas.

The BoM GDE Atlas represents a national-scale, screening-level assessment of potential groundwater dependency, and is intended to identify areas where ecosystems may rely on groundwater, noting that mapped GDEs do not necessarily confirm reliance on regional groundwater sources

Medium HEVAE GDEs were identified within the study area Figure 4-2. These are primarily associated with the creek corridor and adjacent alluvial floodplain deposits located to the west and south of the site. The mapped GDEs are represented by Cumberland Red Gum Riverflat Forest vegetation and are likely linked to riparian and floodplain vegetation communities that rely on soil moisture and shallow subsurface water, particularly during extended dry periods.

Surface water features, including the nearby drainage line, are also considered potential receivers due to their interaction with shallow subsurface conditions within the alluvial deposits.

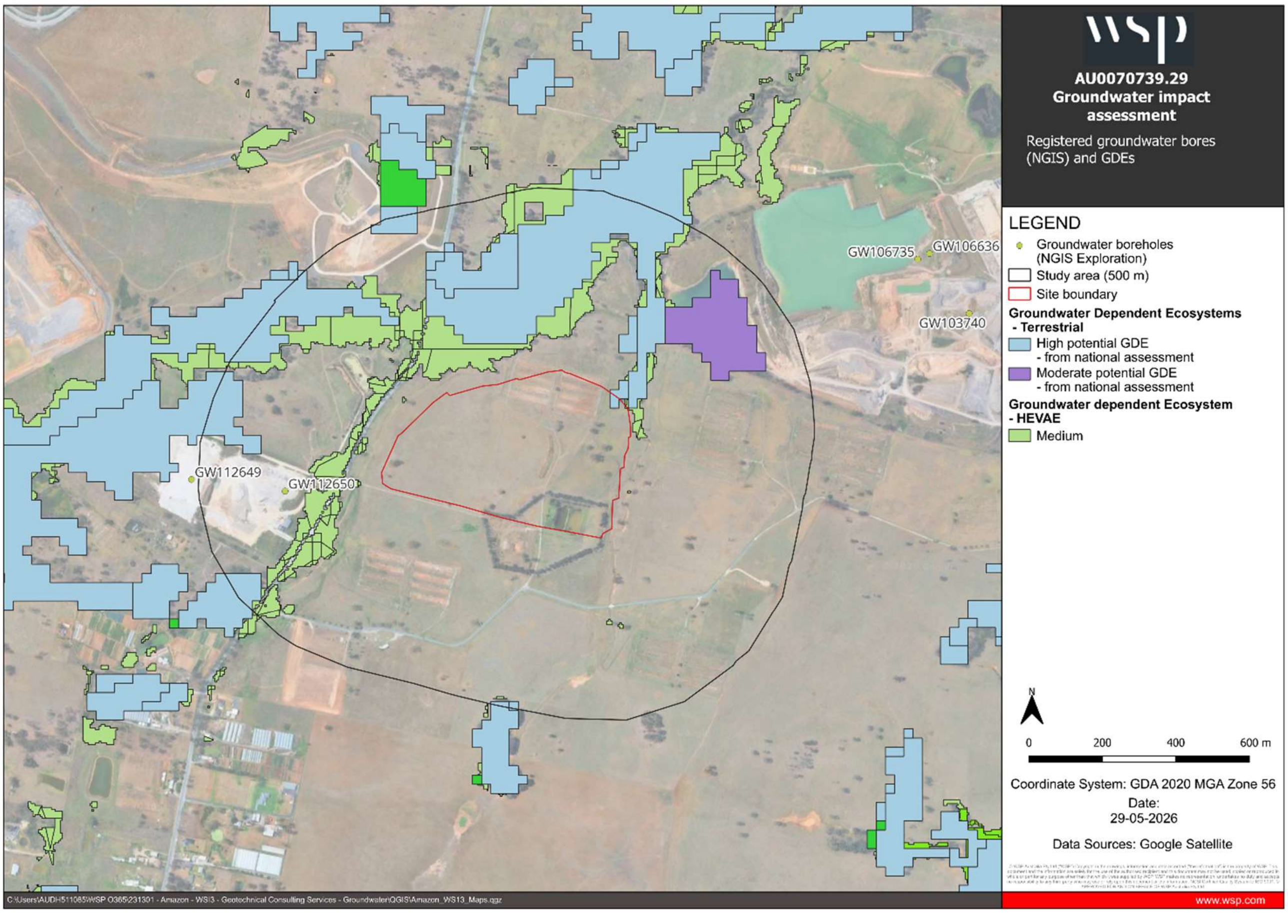


Figure 4-2 Registered groundwater bores (NGIS) and GDEs in and around the groundwater study area

5 Potential impacts

This section provides an assessment of potential impacts to the groundwater environment associated with the proposed development.

5.1 Construction

Construction of the proposed Automated Distribution Centre (ADC) will involve bulk earthworks across the site, including up to approximately 5 m of excavation and up to approximately 2 m of fill, followed by additional excavation during construction, resulting in ground disturbance to depths of up to approximately 7 m. Foundations may include deep piled systems socketed into weathered bedrock, with excavation through residual soils and weathered shale units. Near-surface works are expected to extend to depths of up to approximately 3 mbgl, and activities will involve temporary excavations and installation of subsurface infrastructure, which have the potential to interact with shallow groundwater or perched water conditions, particularly within alluvial deposits and near drainage features (WSP, 2026).

Table 5-1 summarises the potential impacts to the groundwater environment resulting from water affecting activities during construction.

Table 5-1 Potential impacts on groundwater summary during construction

Potential impact	Water affecting activity
Reduced availability of water quantity at sensitive receivers such as GDEs or registered bores	— Excavations (up to approximately 7 m bgl) may locally intercept shallow groundwater or perched water, resulting in minor and temporary groundwater inflows. — A small area of high-potential GDE (BoM) is present along the north-eastern boundary of the site; however, these are screening level features and are not classified as high priority under the NSW HEVAE dataset. — Given the presence of low permeability silty clay and siltstone (low K values), any groundwater drawdown is expected to be negligible and localised, with no measurable impact on GDE function.
Changed recharge or groundwater flow paths.	— Bulk earthworks and site preparation activities, including vegetation removal, may result in temporary changes to surface infiltration. — Excavation within residual soils and weathered rock may cause minor and localised changes to shallow groundwater flow paths.
Changes to groundwater quality (salinity and contamination) affect the availability for use and change the beneficial use of the resource.	— Infiltration of chemicals used in construction, such as fuel and oils from incidental spills or leaks. These would be managed through the implementation of the CEMP.

Although the construction footprint is relatively large, the potential to intercept groundwater is expected to be limited, as groundwater occurs within low permeability silty clay and siltstone units, consistent with low hydraulic conductivity values (10^{-7} to 10^{-5} m/s) obtained from slug testing.

Excavations to depths of up to approximately 7 m bgl may locally encounter shallow or perched groundwater, particularly near drainage features; however, any inflows are expected to be minor, localised and temporary.

Overall, impacts to groundwater levels and flow are expected to be negligible, with limited influence on surrounding receivers, including GDEs, noting that a small and localised area of potential GDEs are present along the north-eastern boundary of the site.

5.1.1.1 Aquifer interference policy – minimum impact considerations

Overview

The AIP is used to guide proponents and the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) in assessing aquifer interference activities. The AIP provides a framework for assessing the impacts of aquifer interference activities on groundwater resources and defines minimal impact considerations to ensure no more than minimal harm occurs to key water-dependent assets. Two levels of minimal impact considerations are specified. If the potential impacts are less than the Level 1 minimal impact considerations, then these impacts would be considered as acceptable.

The maximum depth of construction activities is proposed to be 7 mbgl, and only the Sydney Basin Central Groundwater Source may be intercepted.

Assessment

The AIP minimal impacts considerations for less productive water sources (Sydney Basin Central Groundwater Source) in the study area are presented in Table 5-2 for alluvial groundwater sources.

Table 5-2 AIP minimal impact considerations – less productive alluvial water sources

AIP minimal impact consideration	Response
Water sharing plan and groundwater sources	Sydney Basin Central Groundwater Source
Water table Less than 10 per cent cumulative variation in the water table, allowing for typical climatic "post-water sharing plan" variations, 40 metres from any high priority groundwater dependent ecosystem or high priority culturally significant site listed in the Schedule of the relevant water sharing plan. A maximum of a 2-metres decline cumulatively at any water supply work. Water pressure A cumulative pressure head decline of not more than a 2 metres decline, at any water supply work.	There are no high priority HEVAE GDEs or registered water supply bores within or in close proximity to the proposed excavation areas. A small area of high-potential GDE (BoM) is mapped along the north-eastern boundary of the site; however, this represents a screening-level dataset and is not classified as high priority under the NSW HEVAE dataset. Groundwater at the site occurs within low permeability silty clay and siltstone units, with low hydraulic conductivity values (approximately 10^{-7} to 10^{-5} m/s). If groundwater is encountered during excavations (up to approximately 7 mbgl), it is expected to be minor, localised and temporary, particularly near drainage features or within alluvial materials. Therefore, the proposed activities are not expected to result in measurable or sustained changes to groundwater levels at surrounding receivers. **Conclusion: Does not exceed Level 1 minimal impact consideration thresholds**

AIP minimal impact consideration	Response
Water quality Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres from the activity.	There would be no change to the existing groundwater quality or beneficial use category. Changes to groundwater quality due to contamination can occur from leaks and spills of hazardous substances. Chemicals of primary concern include hydrocarbons, or leaks and spills associated with road traffic. Site specific controls, such as proper storage and bunding of chemicals, site drainage and sedimentation basins at key locations would be used around the proposal to control site runoff. **Conclusion: does not exceed Level 1 minimal impact consideration thresholds**

Minimum impact consideration result

An assessment of the potential impacts of the proposal during construction has been completed in regard to the AIP minimal impact considerations for less productive groundwater sources.

The assessment for Sydney Basin Central Groundwater Source complies with Level 1 minimal impact considerations. This indicates the proposal is anticipated to have minimal impact to the underlying groundwater environment.

5.2 Operation

The potential impacts during operation, including on identified sensitive receivers, are expected to be lower than during construction. Table 5-3 summarises the potential impacts to the groundwater environment during operation of the proposal.

Table 5-3 Potential groundwater impacts during operation

Potential impact	Water affecting activity
Changed recharge or groundwater flow paths	— Permanent hardstand and building areas (e.g. warehouse slab, pavements and hardstand) resulting in localised reduction in surface infiltration. — Permanent subsurface infrastructure, including foundations, footings and services, which may result in minor and localised alteration to shallow groundwater flow paths.
Changes to groundwater quality (salinity and contamination) available for use and change the beneficial use of the resource	— Potential for minor contamination from accidental spills or leaks associated with site operations (e.g. fuels, oils or chemicals). — Given groundwater occurs within low permeability silty clay and siltstone units, any migration of contaminants would be limited and localised.

6 Management and mitigation

6.1 Environmental management

This section describes the proposed measures to avoid and minimise impacts to the groundwater environment during construction and operation of the proposal.

Environmental management will be implemented through a project-specific Construction Environmental Management Plan (CEMP)**,** which will outline procedures to manage potential groundwater impacts during construction.

The CEMP will include measures to manage soil, groundwater and potential contamination risks, including:

— appropriate storage and handling of fuels and chemicals in bunded areas
— provision of spill response kits and procedures
— training of personnel in environmental management requirements
— procedures for managing any groundwater encountered during excavation
— appropriate handling and storage of excavated materials

6.2 Safeguards and management measures

Site-specific mitigation measures have been proposed to minimise potential groundwater impacts associated with the proposal. Mitigation measures are presented in Table 6-1

Table 6-1 Groundwater safeguards and management measures

Ref	Impact	Environmental safeguards	Timing
GW1	Groundwater: interception during excavation	In the event groundwater is encountered, flows are expected to be minor and temporary and will be managed using standard construction practices. Any groundwater take will be recorded and managed in accordance with the Water Management Act 2000.	Construction
GW2	Groundwater: contamination risk	Fuels, oils and chemicals will be stored in bunded areas with appropriate spill containment measures. Spill kits will be available onsite, and any accidental spills or leaks will be contained and remediated immediately to prevent infiltration to groundwater.	Construction
GW3	Groundwater monitoring (if required)	Visual inspection of excavations for groundwater ingress will be undertaken during construction. Additional monitoring will be implemented if unexpected groundwater conditions are encountered.	Construction
GW4	Operational groundwater risk	During operation, the site will include impermeable surfaces and controlled drainage, limiting infiltration. Given the low permeability silty clay and siltstone, impacts to groundwater recharge and flow will be negligible**.**	Operation

7 Conclusion

This report has assessed the potential impacts of the proposed Automated Distribution Centre on the groundwater environment during both construction and operation.

The site is characterised by low permeability silty clay and weathered siltstone units, resulting in limited groundwater occurrence, generally observed as low-yield seepage or localised perched groundwater conditions. Groundwater was encountered at depths of approximately 3 to 5 m below ground level, with low hydraulic conductivity values indicative of limited groundwater flow.

Construction activities, including excavation to depths of up to approximately 7 m below ground level, may locally intercept shallow groundwater; however, any inflows are expected to be minor, temporary and readily manageable. Due to the low permeability of subsurface materials, groundwater drawdown is expected to be limited and localised, with no sustained or measurable impacts beyond the immediate excavation area.

A review of sensitive receivers identified a small and localised area of high-potential GDE along the north-eastern boundary of the site, with more extensive GDEs located outside the site in association with drainage corridors. These GDEs represent screening-level features and are not classified as high priority under the NSW HEVAE framework. Given the low permeability subsurface conditions, impacts to these receivers are expected to be negligible.

Potential impacts to groundwater levels, flow and quality during both construction and operation are expected to be negligible and localised, with no long-term effects on surrounding receivers.

Based on the results of the groundwater impact assessment and with the implementation of standard environmental management measures, the proposal is considered to meet the NSW Aquifer Interference Policy (AIP) Level 1 minimal impact considerations for less productive groundwater sources.

Accordingly, the proposed development is expected to result in minimal impact on the groundwater environment.

8 Limitations

Your attention is drawn to the document "Limitations", which is included in **Appendix E** of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by WSP, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

Bibliography

- Australian Government, 2013. Guidelines for Groundwater Quality Protection in Australia. National Water Quality Management
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000). Australian and New Zealand Environmental and Conservation Council/Agriculture and Resource Management Council of Australia and New Zealand
- Agriculture and Resource Management Council of Australia and New Zealand (2018). Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, 2018. Retrieved from http://waterquality.gov.au/anzguidelines.
- AS/NZS 5667.11:1998. Water Quality – Sampling and Minimum Construction Requirements for Water Bores in Australia, ADIA, 2012.
- Bureau of Meteorology (BoM), 2026. Australian Groundwater Explorer http://www.bom.gov.au/water/groundwater/explorer/index.shtml
- Bureau of Meteorology (BoM), 2026. Groundwater Dependent Ecosystems Atlas. http://www.bom.gov.au/water/groundwater/gde/map.shtml
- Bureau of Meteorology (BoM), 2026. National Groundwater Information System
- Bureau of Meteorology (BoM). (2026). Climate Data Online. Retrieved April 13, 2026, from http://www.bom.gov.au/climate/data/.
- Colquhoun, G P; Hughes, K S; Deyssing, L; Ballard, J C; Folkes, C B; Phillips, G; Troedson, A L; Fitzherbert, J A, 2021. NSW Seamless Geology Data Package. https://search.geoscience.nsw.gov.au/product/9232
- Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2025. PFAS National Environmental Management Plan (NEMP)
- Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2026. High Ecological Value Aquatic Ecosystems (HEVAE) Dataset (SEED Portal), NSW Government.
- Department of Land and Water Conservation (DLWC), 2002. NSW State Groundwater Dependent Ecosystems Policy
- Department of Land and Water Conservation (DLWC), 2022. Site Investigation for Urban Salinity
- EP&A Act 1979. 2021. Environmental Planning and Assessment Act 1979 No 203. NSW: NSW Government, June 4. Accessed November 1, 2021. https://legislation.nsw.gov.au/view/html/inforce/current/act-1979-203#statusinformation.
- EP&A Regulation. 2021. Environmental Planning and Assessment Regulation 2000. NSW: NSW Government, October 30. Accessed November 1, 2021. https://legislation.nsw.gov.au/view/whole/html/inforce/current/sl-2000-0557
- Healey, M. et al. (2018). Applying the High Ecological Value Aquatic Ecosystem (HEVAE) Framework for Riverine Ecosystems. NSW Department of Industry, Sydney.
- Hyder, Z., Butler, J.J., McElwee, C.D., & Liu, W. (1994). Slug Tests in Partially Penetrating Wells. Water Resources Research, Vol. 30, No. 11, pp. 2945-2957.

- Hvorslev, M.J., 1951. Time Lag and Soil Permeability in Groundwater Observations. Bulletin No. 36, U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi
- Minview Seamless Geology. Retrieved from https://minview.geoscience.nsw.gov.au/.
- National Uniform Drillers Licensing Committee (2012). Water Quality – Sampling and Minimum Construction Requirements for Water Bores in Australia. AS/NZS 5667.11:1998.
- National Health and Medical Research Council (NHMRC), 2011. Australian Drinking Water Guidelines
- NSW Department of Planning and Environment (DPE), 2022. Groundwater assessment toolbox for major projects in NSW - Overview document. Technical guideline
- NSW Department of Primary Industries (DPI), 2012. NSW Aquifer Interference Policy
- NSW Department of Primary Industries (DPI), 2013. Groundwater Productivity in NSW
- NSW Department of Planning and Environment (NSW DPE), 2026. High Ecological Value Aquatic Ecosystems (HEVAE) Dataset (SEED Portal)
- WaterNSW, 2026. Continuous water monitoring network https://realtimedata.waternsw.com.au/
- WSP (2026), Geotechnical Investigation Report: Proposed Automated Distribution Centre (ADC), 475 Badgerys Creek Road, Bradfield (Lots 102 and 105 DP1316278), Rev B, prepared for project purposes, May 2026.

Appendix A

Monitoring well construction logs

REPORT OF STANDPIPE INSTALLATION: BH01-MW01

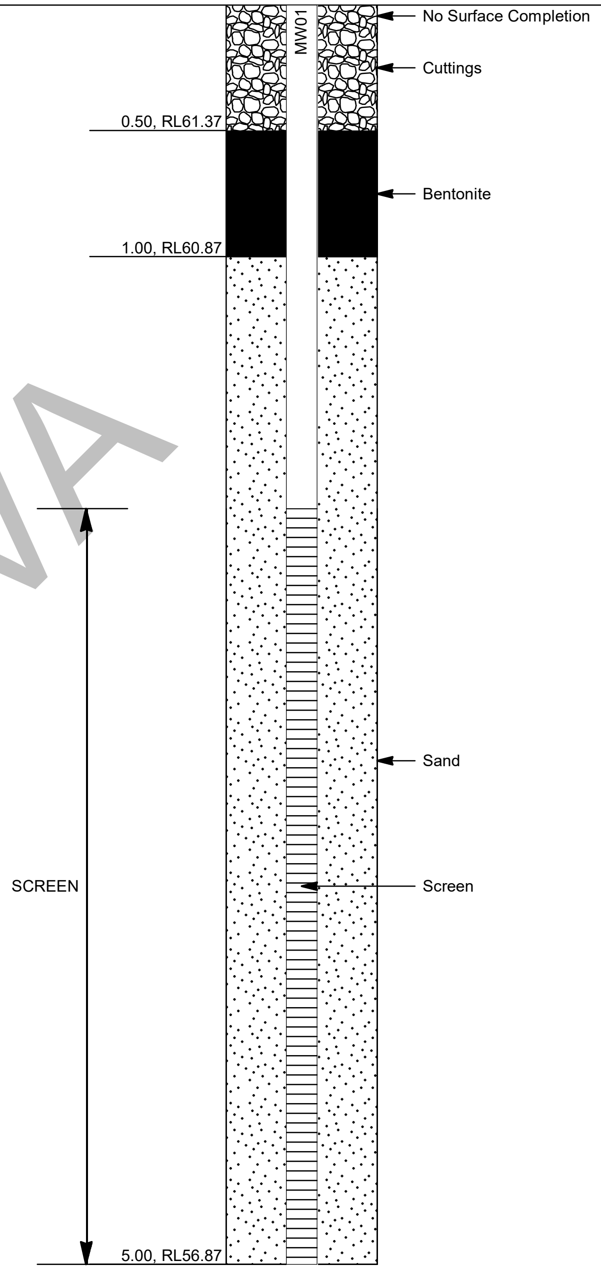
SHEET: 1 OF 1

CLIENT: Confidential Client	COORDS: 290917.7 m E 6246519.7 m N MGA2020-56	DRILL RIG: Commachio 305	
PROJECT: Automated Distribution Centre	SURFACE RL: 61.87 m DATUM: AHD	CONTRACTOR: Terratest	
LOCATION: 475 Badgerys Creek Road, Bradfield NSW	INCLINATION: -90°	LOGGED: PH	DATE: 7/5/26
JOB NO: AU0070739.2943	HOLE DEPTH: 5.00 m	CHECKED:	DATE:

Drilling | **Field Material Description** | **Instrumentation Details**

METHOD	WATER	DEPTH (metres)	DEPTH / RL	SOIL/ROCK MATERIAL DESCRIPTION
AD/T	Not Observed	0	61.87	TOPSOIL
			0.30 / 61.57	FILL
			0.50 / 61.37	Silty CLAY
			3.60 / 58.27	SILTSTONE
		5	5.00 / 56.87	END OF BOREHOLE @ 5.00 m TARGET DEPTH NONE

ID	Type	Tip Depth & RL	Installation Date
MW01		2.00 m 59.87 m AHD	07/05/26



RevA

This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

REPORT OF STANDPIPE INSTALLATION: BH09-MW02

SHEET: 1 OF 1

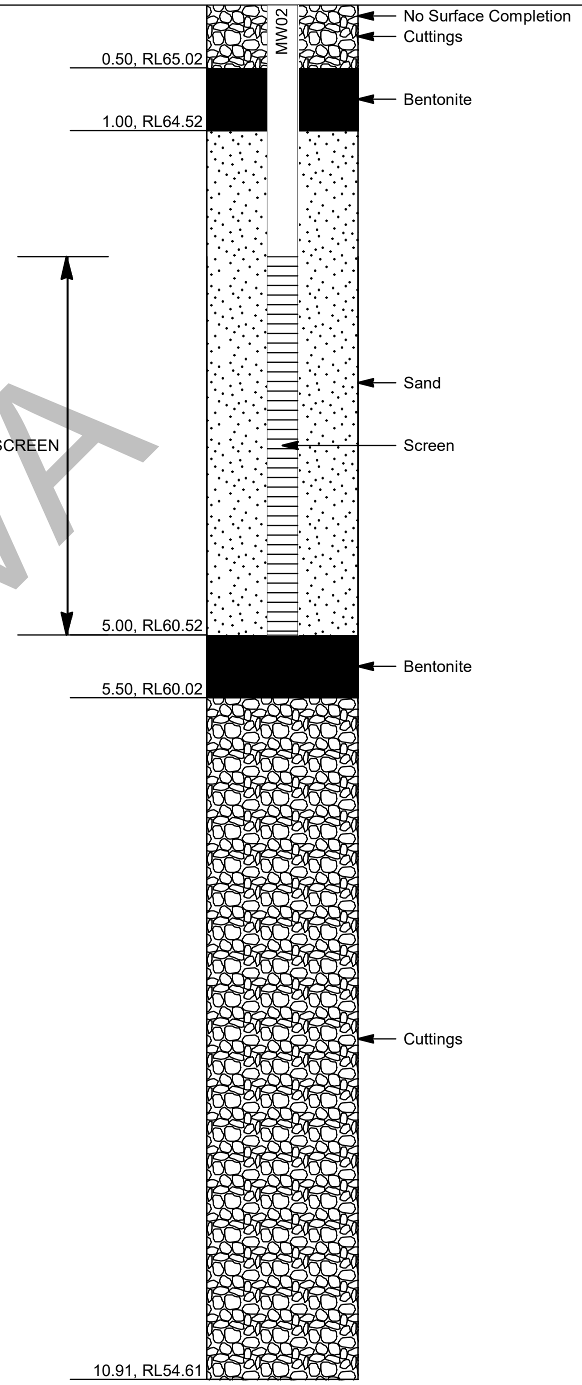
CLIENT: Confidential Client	COORDS: 290882.9 m E 6246342.4 m N MGA2020-56	DRILL RIG: Commachio 305	
PROJECT: Automated Distribution Centre	SURFACE RL: 65.52 m DATUM: AHD	CONTRACTOR: Terratest	
LOCATION: 475 Badgerys Creek Road, Bradfield NSW	INCLINATION: -90°	LOGGED: PH	DATE: 6/5/26
JOB NO: AU0070739.2943	HOLE DEPTH: 10.91 m	CHECKED:	DATE:

Drilling / Field Material Description

METHOD	WATER	DEPTH (metres)	DEPTH / RL	GRAPHIC LOG	SOIL/ROCK MATERIAL DESCRIPTION
AD/T		0	0.25 / 65.52		TOPSOIL
AD/T			0.50 / 65.27		FILL
AD/T	8/5/2026 11:30	2	3.35 / 65.02		Silty CLAY
AD/T		4	4.80 / 62.17		SILTSTONE
HQ3			60.68		SILTSTONE
HQ3		6	6.44		SILTSTONE
HQ3			7.23 / 59.08		INTERBEDDED SILTSTONE & SANDSTONE
HQ3		8	7.96 / 58.29		SANDSTONE
HQ3		10	10.91 / 57.56		INTERBEDDED SILTSTONE & SANDSTONE
		12	54.61		END OF BOREHOLE @ 10.91 m TARGET DEPTH NONE

Instrumentation Details

ID	Type	Tip Depth & RL	Installation Date
MW02		2.00 m 63.52 m AHD	07/05/26



RevA

This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

GAP gINT FN. F17
RL1

WSP-AU 6.00.0 LIB.GLB Log GAP WELL 3 AU0070739.2943-COMBINED.GPJ <<DrawingFile>> 25/5/2026 16:00 10.03.00.09 Datgel Lab and In Situ Tool - DGD | Lib: WSP 6.00.0 2024-06-03 Prj: WSP 5.07.3 2023-12-04

REPORT OF STANDPIPE INSTALLATION: BH11-MW03

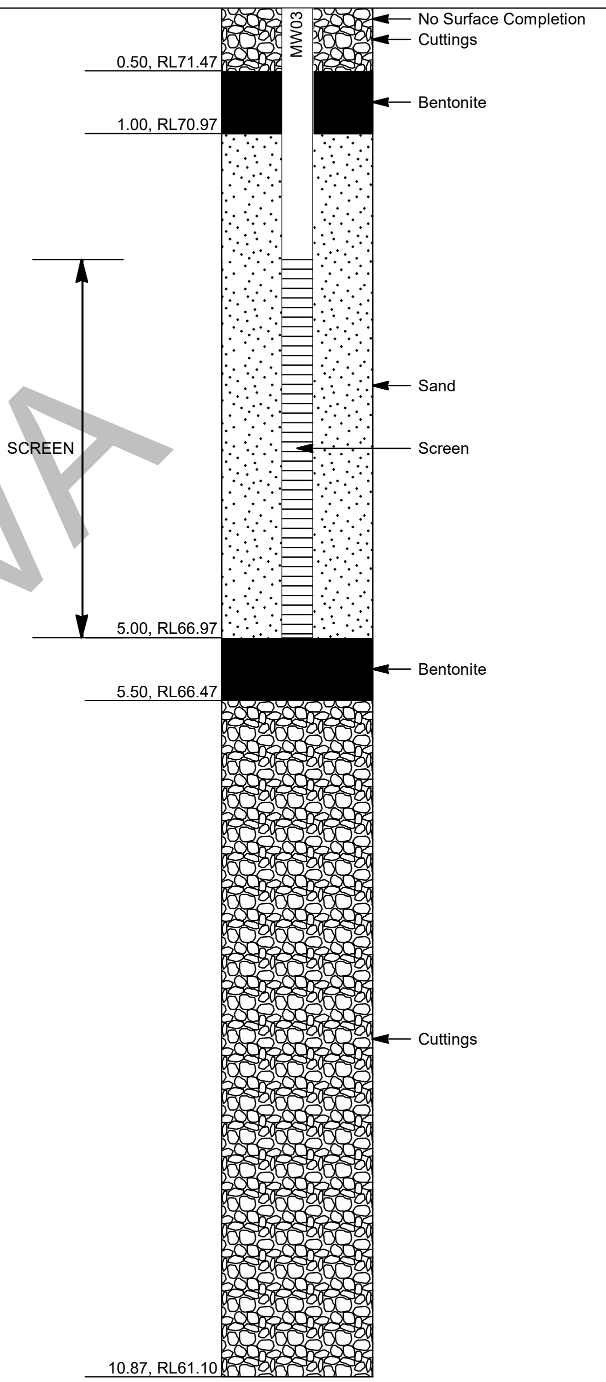
SHEET: 1 OF 1

CLIENT: Confidential Client	COORDS: 291086.6 m E 6246306.7 m N MGA2020-56	DRILL RIG: Commachio 305	
PROJECT: Automated Distribution Centre	SURFACE RL: 71.97 m DATUM: AHD	CONTRACTOR: Terratest	
LOCATION: 475 Badgerys Creek Road, Bradfield NSW	INCLINATION: -90°	LOGGED: PH	DATE: 5/5/26
JOB NO: AU0070739.2943	HOLE DEPTH: 10.87 m	CHECKED:	DATE:

Drilling | **Field Material Description** | **Instrumentation Details**

ID	Type	Tip Depth & RL	Installation Date
MW03		2.00 m 69.97 m AHD	05/05/26

METHOD	WATER	DEPTH (metres)	DEPTH / RL	SOIL/ROCK MATERIAL DESCRIPTION
AD/T	8/5/2026 12:00	0	71.97	TOPSOIL
			0.30 / 71.67	FILL
			0.70 / 71.27	Silty CLAY
		2		
			3.30 / 68.67	SILTSTONE
		4		
HQ3			4.65 / 67.32	SILTSTONE
		6		
			6.77 / 65.20	SILTSTONE
			7.80	NO CORE
		8	7.95 / 64.02	SILTSTONE
		10		
			10.87 / 61.10	END OF BOREHOLE @ 10.87 m TARGET DEPTH NONE
		12		



This report of standpipe installation must be read in conjunction with accompanying notes and abbreviations. It has been prepared for geotechnical purposes only, without attempt to assess possible contamination. Any references to potential contamination are for information only and do not necessarily indicate the presence or absence of soil or groundwater contamination.

Appendix B

Monitoring well development records

MONITORING WELL DEVELOPMENT RECORD

wsp

PROJECT Amazon Warehouse **DATE** 18/5/2026

PROJ. NUMBER ______ **CONTRACTOR** N/A

WSP **STAFF** MK **MON. WELL NAME** BH01 /MW01 /

WEATHER (Temp/Cloud Cover/Precip.) Rain, cloudy

DEVEL. METHOD Bailer

CALCULATION OF MINIMUM DEVELOPMENT VOLUME

All depths measured below top of PVC casing (TOC)

Time	Depth to Water (m) A	Measured Depth of Well (m) B	Depth of Well *from TOC*, from Mon. Well Report Sheet (m) C	Metres of Standing Water D = B - A or C - A, whichever is the greater	1 Well Casing Volume (assuming 50 mm casing) (L) E = D x 2.0	Min. Total Volume to be Pumped during Development (L) F = E x 10
11:40	3.485	5.825		2.34	4.68	14.64

DEVELOPMENT RECORDS

Field Measurements

Time	Cumulative Vol. Purged (L)	Cumulative No. of Surge Cycles	Redox (mV)	pH	Temp (C)	Conductivity (µS/cm)	Appearance (Colour/Clarity)	Odour
12:11	1		170.6	5.91	20.1	18127	Turbid	
12:18	4.5		113.4	5.72	20.1	18608	" pale orange	
12:22	8		93.3	6.02	19.8	14390	" brown	
	11							
	13							
			→	well	dry			

Final Measured Depth of Well from TOC (m) 5.88 mbTOC

MONITORING WELL DEVELOPMENT RECORD

wsp

PROJECT	Amazon Warehouse	DATE	18/5/2026
PROJ. NUMBER		CONTRACTOR	N/A
WSP STAFF	VK	MON. WELL NAME	BH09/MW02

WEATHER (Temp/Cloud Cover/Precip.) Bailer

DEVEL. METHOD Rain, cloudy

CALCULATION OF MINIMUM DEVELOPMENT VOLUME

All depths measured below top of PVC casing (TOC)

Time	Depth to Water (m) A	Measured Depth of Well (m) B	Depth of Well *from TOC*, from Mon. Well Report Sheet (m) C	Metres of Standing Water D = B - A or C - A, whichever is the greater	1 Well Casing Volume (assuming 50 mm casing) (L) E = D x 2.0	Min. Total Volume to be Pumped during Development (L) F = E x 10
12:55	4.9	5.325	~~4.4~~ 6.2	~~0.425~~ 1.3	2.6	28

DEVELOPMENT RECORDS

Field Measurements

Time	Cumulative Vol. Purged (L)	Cumulative No. of Surge Cycles	Redox (mV)	pH	Temp (C)	Conductivity (µS/cm)	Appearance (Colour/Clarity)	Odour
1:24	1		-22.6	6.51	20.8	2844	Turbid brown 'sludge'	sulfur?
				→	Well go dry			

Final Measured Depth of Well from TOC (m) ________

MONITORING WELL DEVELOPMENT RECORD

WSP

PROJECT Amazon Warehouse **DATE** 18/05/2026

PROJ. NUMBER **CONTRACTOR** N/A

WSP **STAFF** KK **MON. WELL NAME** 04 11 / MW03

WEATHER (Temp/Cloud Cover/Precip.) Rain, cloudy

DEVEL. METHOD Bailer

CALCULATION OF MINIMUM DEVELOPMENT VOLUME

All depths measured below top of PVC casing (TOC)

Time	Depth to Water (m)	Measured Depth of Well (m)	Depth of Well *from TOC*, from Mon. Well Report Sheet (m)	Metres of Standing Water	1 Well Casing Volume (assuming 50 mm casing) (L)	Min. Total Volume to be Pumped during Development (L)
	A	B	C	D = B - A or C - A, whichever is the greater	E = D x 2.0	F = E x 10
	5.300	5.19[illegible]	6.160	0.8	1.6	4.8

DEVELOPMENT RECORDS

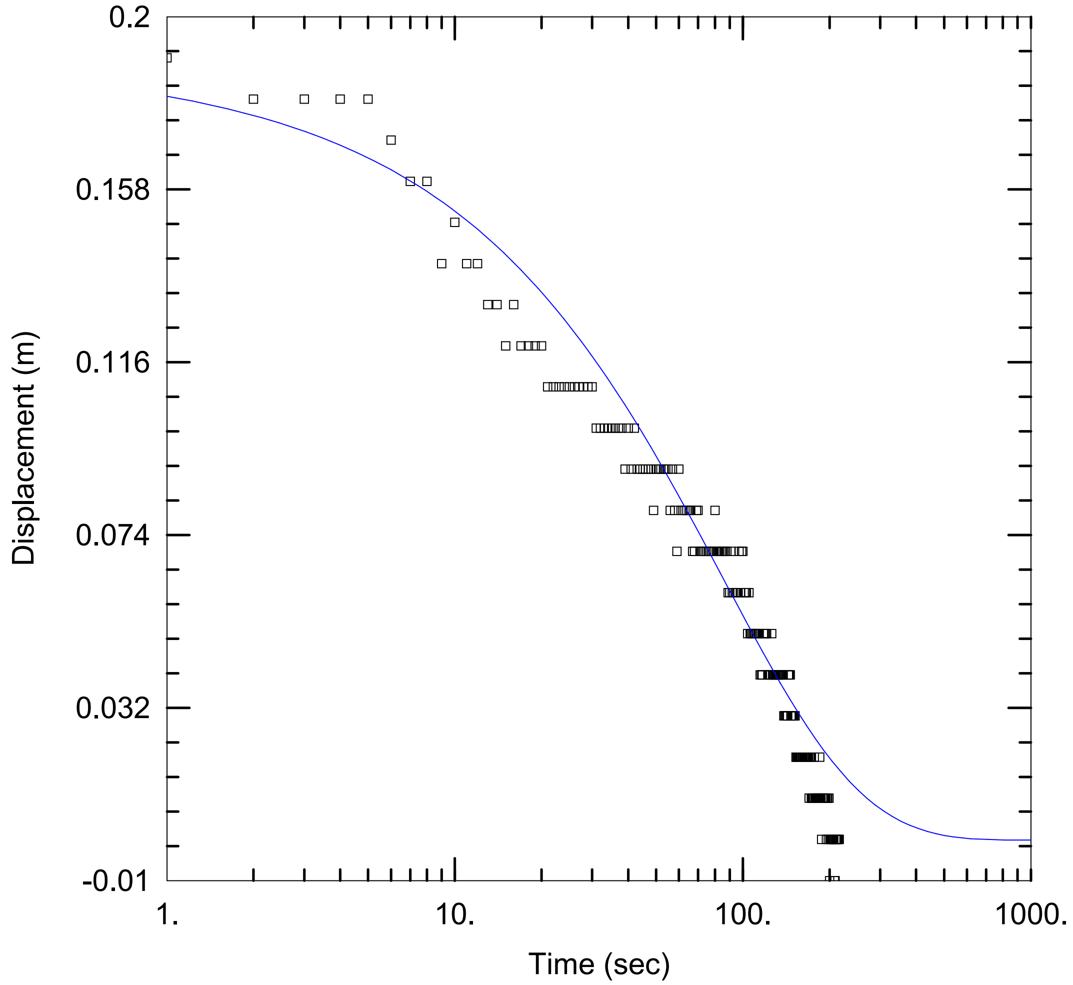
Field Measurements

Time	Cumulative Vol. Purged (L)	Cumulative No. of Surge Cycles	Redox (mV)	pH	Temp (C)	Conductivity (µS/cm) SPC	Appearance (Colour/Clarity)	Odour
3:03	1		95.7	7.03	20.2	3355	Turbid brown	
3:06	3		96.0	6.62	20.2	3360	" "	
	4							
	5							
			→ dry					
				→ dry	go			

Final Measured Depth of Well from TOC (m) 5.18

Appendix C

Slug test analyses



WELL TEST ANALYSIS

Data Set: C:\...\BH01-MW01_TS1#1_RH_KGS.aqt
Date: 05/29/26 Time: 10:55:32

PROJECT INFORMATION

Company: WSP
Client: Amazon Australia
Project: PP231301
Location: Badgerys Creek, NSW
Test Well: BH01/MW02
Test Date: 22/05/2026

AQUIFER DATA

Saturated Thickness: 0.28 m

WELL DATA (New Well)

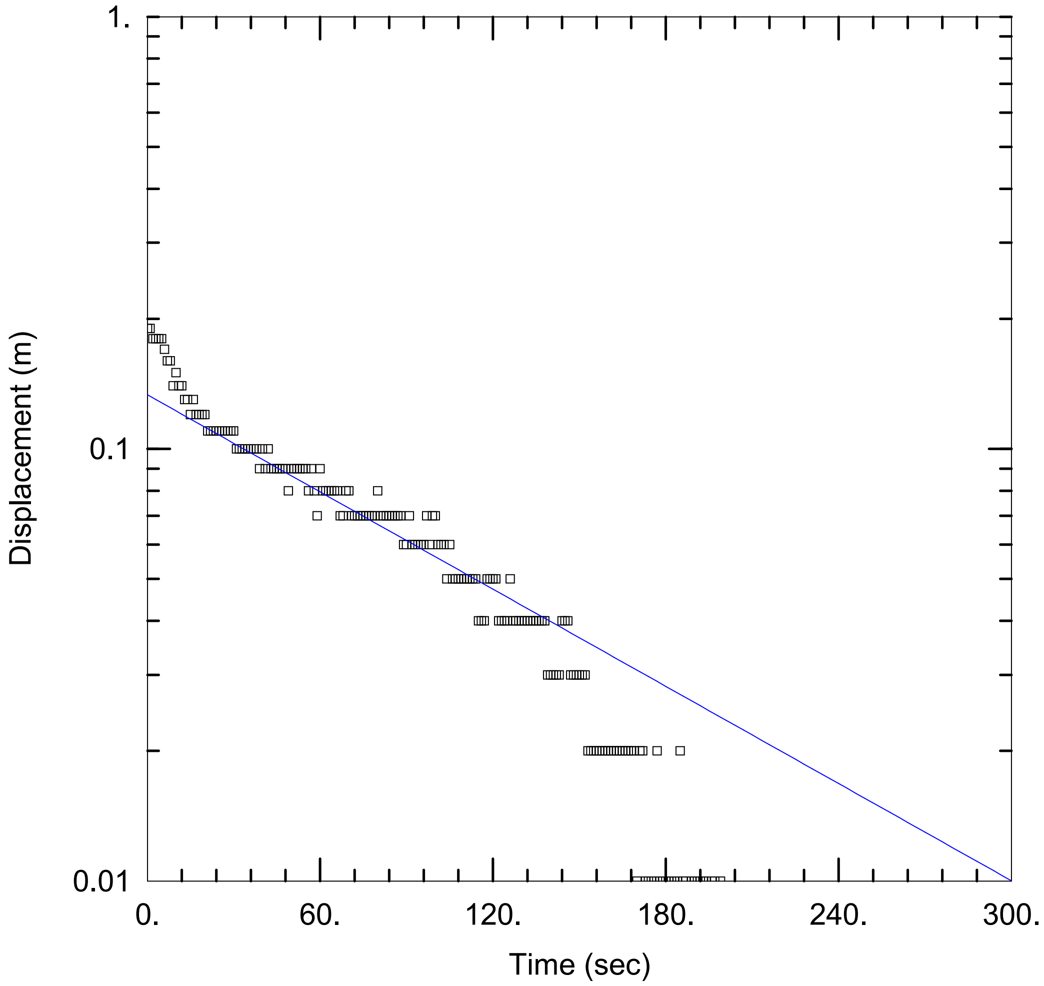
Initial Displacement: 0.19 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m

Static Water Column Height: 0.28 m
Screen Length: 3. m
Well Radius: 0.048 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

Kr = 1.918E-5 m/sec
Ss = 0.03708 m^{-1}
Kz/Kr = 1.



WELL TEST ANALYSIS

Data Set: C:\...\BH01-MW01_TS1#1_RH_HVR.aqt
Date: 05/29/26 Time: 10:54:19

PROJECT INFORMATION

Company: WSP
Client: Amazon Australia
Project: PP231301
Location: Badgerys Creek, NSW
Test Well: BH01/MW02
Test Date: 22/05/2026

AQUIFER DATA

Saturated Thickness: 0.28 m Anisotropy Ratio (Kz/Kr): 1.

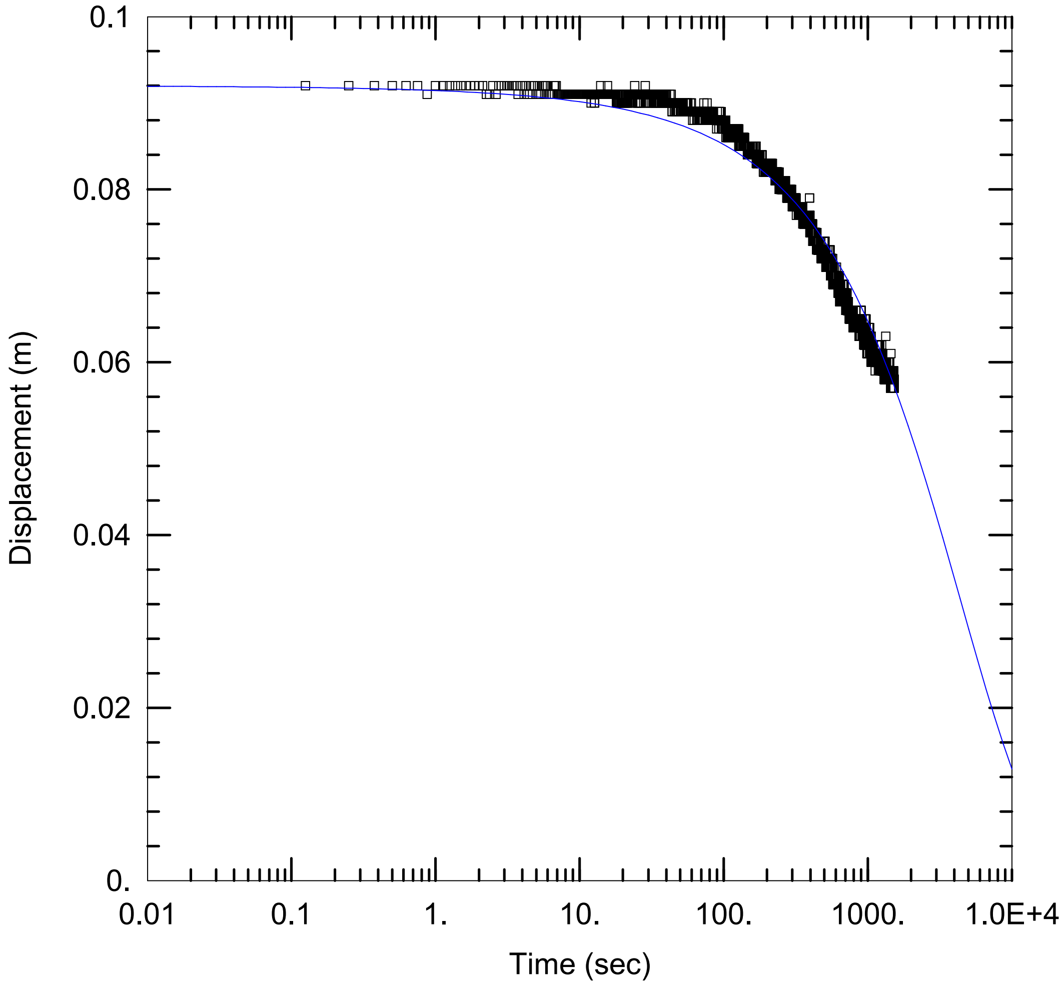
WELL DATA (New Well)

Initial Displacement: 0.19 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m
Static Water Column Height: 0.28 m
Screen Length: 3. m
Well Radius: 0.048 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 5.105E-5 m/sec y0 = 0.1335 m



WELL TEST ANALYSIS

Data Set: C:\...\BH09-MW02_TS1#1_RH_KGS.aqt
Date: 05/29/26 Time: 10:56:31

PROJECT INFORMATION

Company: WSP
Client: Amazon Australia
Project: PP231301
Location: Badgerys Creek, NSW
Test Well: BH09/MW02
Test Date: 22/05/2026

AQUIFER DATA

Saturated Thickness: 0.505 m

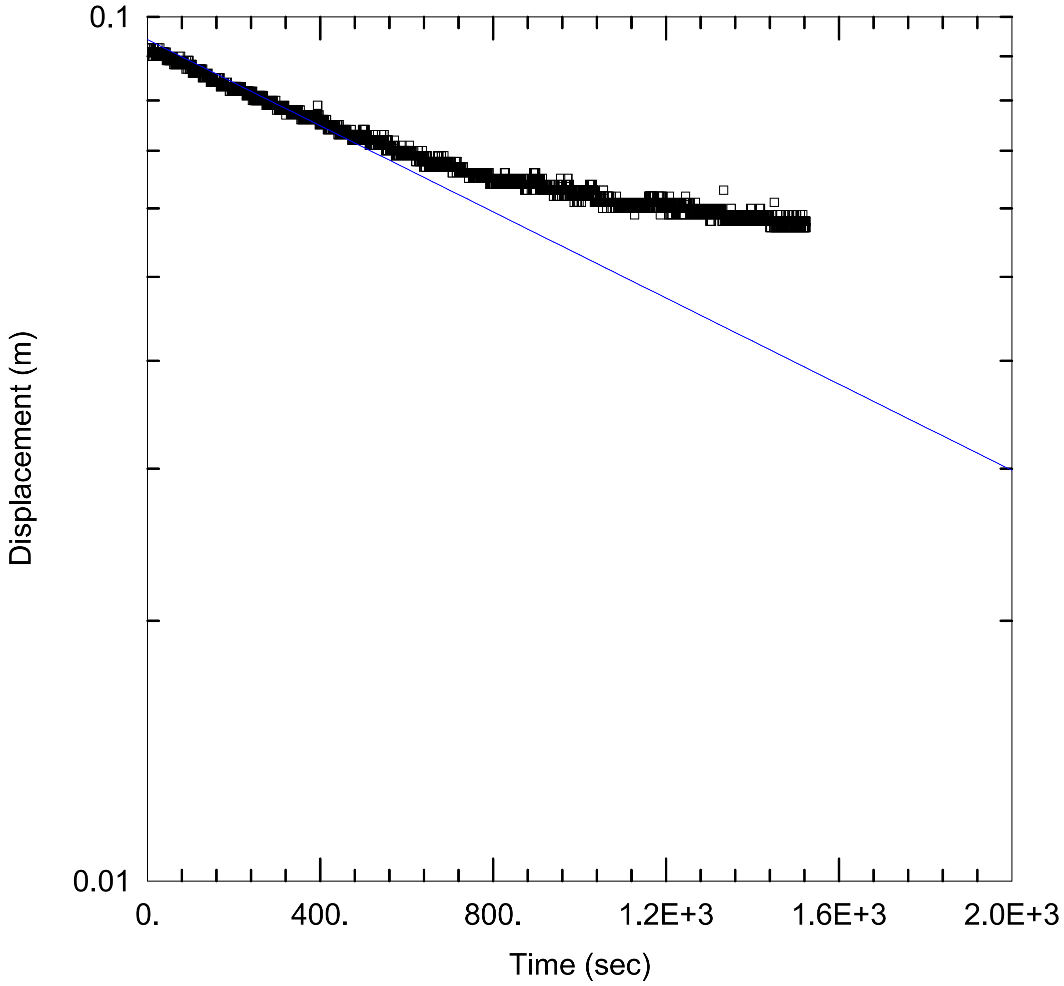
WELL DATA (New Well)

Initial Displacement: 0.092 m
Total Well Penetration Depth: 3. m
Casing Radius: 0.025 m
Static Water Column Height: 0.505 m
Screen Length: 3. m
Well Radius: 0.048 m

SOLUTION

Aquifer Model: Unconfined
Solution Method: KGS Model

Kr = 2.42E-7 m/sec
Kz/Kr = 1.
Ss = 0.01803 m^{-1}



WELL TEST ANALYSIS

Data Set: C:\...\BH09-MW02_TS1#1_RH_HVR.aqt
Date: 05/29/26 Time: 10:56:00

PROJECT INFORMATION

Company: WSP
Client: Amazon Australia
Project: PP231301
Location: Badgerys Creek, NSW
Test Well: BH09/MW02
Test Date: 22/05/2026

AQUIFER DATA

Saturated Thickness: 0.505 m Anisotropy Ratio (Kz/Kr): 1.

WELL DATA (New Well)

Initial Displacement: 0.092 m Static Water Column Height: 0.505 m
Total Well Penetration Depth: 3. m Screen Length: 3. m
Casing Radius: 0.025 m Well Radius: 0.048 m

SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev

K = 1.882E-6 m/sec y0 = 0.0941 m

Appendix D

Groundwater quality results

	Unit	EQL	ANZG (2018) Freshwater 95% LOSP Toxicant DGVs (March 2021)	ANZG (2018) Marine Water 95% LOSP Toxicant DGVs (March 2021)	ANZG PFOS DGVs 95% Eco Fresh Water (2026)	PFAS NEMP 2025 Freshwater and Interim marine 95%	BH01/MW01	BH09/MW02	BH11/MW03
Location Code							BH01/MW01	BH09/MW02	BH11/MW03
Date							19-05-2026	19-05-2026	19-05-2026
Field Parameters									
pH	pH_Units						6.23	6.49	6.62
Electrical Conductivity	µS/cm						17,581	4,716	2,936
Dissolved Oxygen	mg/L						0.07		0.07
Total Dissolved Solids	mg/L						11,427	3,068	1,911
Temperature	°C						19.8	20.4	20.2
Redox Potential	mV						136	44.3	110.6
Sample Quality Parameters									
pH (Lab)	pH_Units	0.01					6.70	7.01	7.61
Hydroxide Alkalinity (as CaCO3)	mg/L	1					<1		
Total Alkalinity (as CaCO3)	mg/L	1					148		
Total Phosphorus (as P)	mg/L	0.01					0.17	111	42.2
Fluoride	mg/L	0.1					0.2	<1.0 [#1]	3.2
Reactive Phosphorus (as P) (filtered)	mg/L	0.01					<0.01	<0.01	<0.01
Carbonate Alkalinity (as CaCO3)	mg/L	1					<1		
Bicarbonate Alkalinity (as CaCO3)	mg/L	1					148		
Sulphate (as SO4) (filtered)	mg/L	1					892	205	352
Ionic Balance (Lab)	%	0.01					1.02		
Inorganics									
Fixed Ammonia as N	mg/L	0.1					1.2	4.3	
Lime Diss Carbonic Acid as CO2	mg/L	2					43		
Total Dissolved Solids @180°C	mg/L	10					13,700	1,710	
Major Ions									
Sodium (filtered)	mg/L	1					3,260	702	923
Potassium (filtered)	mg/L	1					15	26	10
Calcium (filtered)	mg/L	1					99	48	34
Magnesium (filtered)	mg/L	1					648	77	84
Chloride	mg/L	1					6,200	923	1,140
Nutrients									
Nitrate (as N)	mg/L	0.01					0.09	<0.01	0.01
Nitrite (as N)	mg/L	0.01					0.02	0.02	0.02
Nitrate + Nitrite (as N)	mg/L	0.01					0.11	0.01	0.03
Ammonia (as N)	mg/L	0.01	0.9	0.91			0.30	3.29	0.01
Total Kjeldahl Nitrogen (as N)	mg/L	0.1					1.7	222	<50.0 [#1]
Nitrogen (Total)	mg/L	0.1					1.8	222	<50.0 [#1]
Heavy Metals									
Arsenic	mg/L	0.001					0.002	0.030	0.161
Arsenic (filtered)	mg/L	0.001					0.002	0.004	<0.010 [#1]
Cadmium	mg/L	0.0001	0.0002	0.0055			0.0008	0.0006	0.0046
Cadmium (filtered)	mg/L	0.0001	0.0002	0.0055			0.0006	<0.0001	<0.0010 [#1]
Chromium	mg/L	0.001					0.002	0.062	1.03
Chromium (filtered)	mg/L	0.001					<0.001	<0.001	<0.010 [#1]
Copper	mg/L	0.001	0.0014	0.0013			0.017	0.119	2.17
Copper (filtered)	mg/L	0.001	0.0014	0.0013			0.002	<0.001	<0.010 [#1]
Iron	mg/L	0.05					1.07	220	1,490
Iron (filtered)	mg/L	0.05					<0.05	0.48	<0.10 [#1]
Lead	mg/L	0.001	0.0034	0.0044			0.011	0.053	0.679
Lead (filtered)	mg/L	0.001	0.0034	0.0044			<0.001	<0.001	<0.010 [#1]
Mercury	mg/L	0.0001	0.0006	0.0004			<0.0001	<0.0010 [#1]	<0.0010 [#1]
Mercury (filtered)	mg/L	0.0001	0.0006	0.0004			<0.0001	<0.0001	<0.0001
Nickel	mg/L	0.001	0.011	0.07			0.134	0.121	1.23
Nickel (filtered)	mg/L	0.001	0.011	0.07			0.125	0.003	<0.010 [#1]
Silicon (filtered)	mg/L	0.05					15.9	15.1	7.09
Zinc	mg/L	0.005	0.008	0.008			0.205	0.335	4.54
Zinc (filtered)	mg/L	0.005	0.008	0.008			0.174	<0.005	<0.050 [#1]
Total Petroleum Hydrocarbons									
TRH C6 - C9 Fraction	mg/L	0.02					<0.02	0.1	
TRH C10 - C14 Fraction	mg/L	0.05					<0.05	2.82	
TRH C15 - C28 Fraction	mg/L	0.1					<0.1	4.24	
TRH C29 - C36 Fraction	mg/L	0.05					<0.05	0.15	
TRH+C10 - C36 (Sum of total)	mg/L	0.05					<0.05	7.21	
TRH C6 - C10 Fraction F1	mg/L	0.02					<0.02	0.05	
TRH C6 - C10 Fraction Less BTEX F1	mg/L	0.02					<0.02	0.05	
TRH >C10 - C16 Fraction F2	mg/L	0.1					<0.1	6.62	
TRH >C10 - C16 Fraction Less Naphthalene F2	mg/L	0.1					<0.1	6.62	
TRH >C16 - C34 Fraction F3	mg/L	0.1					<0.1	0.63	
TRH >C34 - C40 Fraction F4	mg/L	0.1					<0.1	0.13	
TRH+C10 - C40 (Sum of total)	mg/L	0.1					<0.1	7.38	
Per- and polyfluoroalkyl substances (PFAS)									
Perfluorononanesulfonic acid (PFNS)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorodecane sulfonic acid (PFDS)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoro-n-hexadecanoic acid	ug/L	0.05					<0.05	<0.12 [#1]	
N-Methyl PFO sulfonamidoethanol (MeFOSE)	ug/L	0.05					<0.05	<0.12 [#1]	
N-methyl-PFO sulfonamidoacetic acid (MeFOSAA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorooctanoic Acid (PFOA)	ug/L	0.01				220	<0.01	<0.05 [#1]	
Perfluorooctane sulfonic acid (PFOS)	ug/L	0.01			0.9	0.13	<0.01	<0.05 [#1]	
Perfluorohexane sulfonic acid (PFHxS)	ug/L	0.01					<0.01	<0.05 [#1]	
Sum of PFHxS and PFOS (lab reported)	ug/L	0.01					<0.01	<0.05 [#1]	
Sum of WA DER PFAS (n=10)	ug/L	0.01					<0.01	<0.05 [#1]	
Sum of PFAS	ug/L	0.01					<0.01	<0.05 [#1]	
Perfluorobutanoic acid (PFBA)	ug/L	0.1					<0.1	<0.2 [#1]	
Perfluorohexanoic acid (PFHxA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoroheptanoic acid (PFHpA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorodecanoic acid (PFDA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoropentanoic acid (PFPeA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorononanoic acid (PFNA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	0.05					<0.05	<0.12 [#1]	
Perfluorotridecanoic acid (PFTrDA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorododecanoic acid (PFDoDA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoroundecanoic acid (PFUnDA)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoroheptane sulfonic acid (PFHpS)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluoropentane sulfonic acid (PFPeS)	ug/L	0.02					<0.02	<0.05 [#1]	
Perfluorobutane sulfonic acid (PFBS)	ug/L	0.02					<0.02	<0.05 [#1]	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ug/L	0.05					<0.05	<0.05	
6:2 Fluorotelomer sulfonic acid (6:2 FTSA)	ug/L	0.05					<0.05	<0.05	
8:2 Fluorotelomer sulfonic acid (8:2 FTSA)	ug/L	0.05					<0.05	<0.05	
10:2 Fluorotelomer sulfonic acid (10:2 FTSA)	ug/L	0.05					<0.05	<0.05	
N-Ethyl PFO sulfonamide (EtFOSA)	ug/L	0.05					<0.05	<0.12 [#1]	
N-Ethyl PFO sulfonamidoethanol (EtFOSE)	ug/L	0.05					<0.05	<0.12 [#1]	
N-Methyl PFO sulfonamide (MeFOSA)	ug/L	0.05					<0.05	<0.12 [#1]	
Perfluorooctane sulfonamide (FOSA)	ug/L	0.02					<0.02	<0.05 [#1]	
N-ethyl-PFO sulfonamidoacetic acid (EtFOSAA)	ug/L	0.02					<0.02	<0.05 [#1]	
BTEXN									
Benzene	mg/L	0.001	0.95	0.7			<0.001	0.001	
Toluene	mg/L	0.002	0.18	0.18			<0.002	0.002	
Ethylbenzene	mg/L	0.002	0.08	0.08			<0.002	<0.002	
Xylenes (m & p)	mg/L	0.002					<0.002	<0.002	
Xylene (o)	mg/L	0.002	0.35				<0.002	<0.002	
Naphthalene	mg/L	0.001	0.016	0.07			<0.0010	<0.0010	
Xylenes (Sum of total)	mg/L	0.002					<0.002	<0.002	
Naphthalene (VOC)	mg/L	0.005	0.016	0.07			<0.005	<0.005	
Total BTEX	mg/L	0.001					<0.001	0.003	
Polycyclic aromatic hydrocarbons									
Acenaphthene	mg/L	0.001					<0.0010	<0.0010	
Acenaphthylene	mg/L	0.001					<0.0010	<0.0010	
Anthracene	mg/L	0.001	0.0004	0.0004			<0.0010	<0.0010	
Benz(a)anthracene	mg/L	0.001					<0.0010	<0.0010	
Benzo(a)pyrene	mg/L	0.0005	0.0002	0.0002			<0.0005	<0.0008 [#1]	
Benzo(a)pyrene TEQ (lower bound)*	mg/L	0.0005					<0.0005	<0.0005	
Benzo(b)&(j)fluoranthene	mg/L	0.001					<0.0010	<0.0010	
Benzo(g,h,i)perylene	mg/L	0.001					<0.0010	<0.0010	
Benzo(k)fluoranthene	mg/L	0.001					<0.0010	<0.0010	
Chrysene	mg/L	0.001					<0.0010	<0.0010	
Dibenz(a,h)anthracene	mg/L	0.001					<0.0010	<0.0010	
Fluoranthene	mg/L	0.001	0.0014	0.0014			<0.0010	<0.0010	
Fluorene	mg/L	0.001					<0.0010	<0.0010	
Indeno(1,2,3-c,d)pyrene	mg/L	0.001					<0.0010	<0.0010	
Phenanthrene	mg/L	0.001	0.002	0.002			<0.0010	<0.0010	
Pyrene	mg/L	0.001					<0.0010	<0.0010	
PAH (Sum of Common 16 PAHs)	mg/L	0.0005					<0.0005	<0.0005	
Exposure Classification									
Exposure Classification - Concrete Piles Soil Condition	-						Moderate	Mild	Mild
Exposure Classification - Steel Piles Condition	-						Mild	Non-aggressive	Mild
Major/minor ions									
Total Anions	meq/L	0.01					196		
Total Cations	meq/L	0.01					200		
Other									
Sodium Absorption Ratio (filtered)	-	0.01					26.3	14.6	19.3

Comments
#1 Reported Analyte LOR is higher than Requested Analyte LOR

Environmental Standards
ANZG, March 2021, ANZG (2018) Freshwater 95% LOSP Toxicant DGVs (March 2021)
ANZG, March 2021, ANZG (2018) Marine Water 95% LOSP Toxicant DGVs (March 2021)
ANZG, 2026, ANZG PFOS DGVs 95% Eco Fresh Water (2026)
HEPA, March 2025, PFAS NEMP 2025 Freshwater 95%
HEPA, March 2025, PFAS NEMP 2025 Interim marine 95%

Statistics
* A Non Detect Multiplier of 0.5 has been applied.

Appendix E

Limitations

Limitation Statement

This Report is provided by WSP Australia Pty Limited (WSP) for the Client in relation to the Hydrogeological Investigation Report for the Proposed Automated Distribution Centre (ADC) at 475 Badgerys Creek Road, Bradfield (Lots 208, 209 and 210) in response to specific instructions and in accordance with WSP's proposal dated 11 May 2026 and agreement with the Client (Agreement).

PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (*Permitted Purpose*).

QUALIFICATIONS AND ASSUMPTIONS

The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (*Conclusions*) are based in whole or in part on information provided by the Client and other parties identified in the report (*Information)*, those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

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