Surface Water and Groundwater Impact Assessment – Mamre Road Data Centre Campus, 706-752 Mamre Road Kemps Ck

Plan Project Management Pty Ltd

Report

JBS&G 70548 | 172,177/Rev0

26 November 2025

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation,
we commit to working together for our shared future.

Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte

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Appendix A JBS&G, 2025b – Surface Water and Groundwater Sampling Event – 706-752 Mamre Rd, Kemps Creek, NSW

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by Plan Project Management Pty Ltd (the client) to prepare a Surface Water and Groundwater Impact Assessment for the proposed development at 706–752 Mamre Road, Kemps Creek, NSW (the site). The site covers approximately 52 ha and is legally identified as Lot 10 DP 1280592.

The site is proposed for development under a State Significant Development Application (SSDA) as a data centre campus comprising:

- Approximately 26 shells across four-storeys data centre buildings (4x four shells and 2x five shells), including six technical office buildings, plus a campus office.
- Incoming and internal electrical substations and associated infrastructure.
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

The Planning Secretary's Environmental Assessment Requirements (SEARs) for SSD-92743706 require an assessment of potential surface water and groundwater impacts (both quality and quantity), including impacts on watercourses, riparian areas, groundwater, and groundwater-dependent communities, in accordance with relevant EPA guidelines and the DCCEEW Groundwater Assessment Toolkit (NSW DCCEEW, 2022). The table below summarises the SEARs requirements addressed by this report.

SEARs Compliance Table - Application Number: SSD-92743706

SEARs Section	Item request	Item Addressed
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, groundwater, and groundwater-dependent communities nearby in accordance with relevant EPA guidelines and the Department of Climate Change, Energy, the Environment and Water - Water Group (DCCEEW-Water) Groundwater Toolkit	This report provides site a surface water and groundwater quality assessment of the potential impacts associated with the development on watercourses, riparian areas, groundwater, and groundwater dependent communities nearby in accordance with the relevant EPA guidelines and DCCEEW Water Groundwater Toolkit.

This assessment has been informed by a comprehensive review of existing technical reports and datasets.

A Hydrogeology–Conceptual Site Model (H-CSM) was developed to characterise the shallow groundwater system, which comprises a low-yield unconfined aquitard (residual soils and weathered Bringelly Shale) underlain by a regionally continuous aquiclude (moderately weathered to fresh shale). Groundwater levels range between approximately 59–68 m AHD and are strongly controlled by topography.

Bulk excavation will intersect groundwater only in isolated ridge-top areas. Groundwater will be removed only by excavation, with no pumping or depressurisation required. The total estimated groundwater take is approximately 0.6 ML, representing a one-off removal of groundwater contained within the shallow aquitard. No long-term groundwater management is required.

Recommendations include:

- Continuation of groundwater level monitoring, including manual and regular logger downloads once per quarter up until the end of the construction phase. Noting that some sites may need to be moved for continuous monitoring during construction. Monitoring should then continue at the same interval through the operations phase for 12 months.

- Quarterly groundwater and surface water quality monitoring should continue at the same frequency as the water level monitoring for the next 12 months. Sampling can then be moved to biannually for the remainder of the pre-construction and construction phase. Monitoring should then continue at the same interval through the operations phase for 12 months.

Overall, the proposed development is expected to result in no significant impacts to surface water, groundwater, or associated environmental receptors, and is considered environmentally acceptable with respect to the SEARs.

1. Introduction

This Section presents the context, objective and layout of the report.

1.1 Project Overview

The proposed development is to establish a modern data centre campus that supports long term digital infrastructure needs within the Mamre Road Precinct. The intention is to deliver a high capacity, resilient and energy efficient facility that aligns with the Precinct's vision for industrial and employment land. The project forms part of a broader program of investment across Western Sydney and is expected to support technology services, employment generation and regional economic activity.

The site is currently characterised as rural land containing areas of pasture, scattered vegetation, access tracks and several existing farm dams. The land has historically been used for agricultural and low intensity rural activities, with some areas previously disturbed by former farming infrastructure and local drainage modifications. The site presently contains no large-scale built structures relevant to the proposed development and has limited existing servicing, stormwater infrastructure or engineered foundations.

The proposal will introduce significant changes to the landform to enable the establishment of the data centre campus. Bulk earthworks will regrade the site to achieve a consistent development platform that accommodates multi storey buildings, internal roads and associated utilities. These works include substantial cut and fill activities, with localised cuts of up to approximately twenty one metres and fills of up to approximately sixteen metres in some areas. The objective of these works is to provide stable foundation conditions, rationalise existing topography and integrate the campus layout with the surrounding trunk infrastructure identified in the Mamre Road Precinct Development Control Plan. The resulting landform will replace irregular rural terrain with a managed and structurally engineered platform suitable for long term operation of the facility.

1.2 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Plan Project Management Pty Ltd (the client) to prepare a Surface Water and Groundwater Impact Assessment for the proposed Mamre Road Data Centre Campus located at 706 to 752 Mamre Road, Kemps Creek, NSW (the site). The site covers an area of approximately 52 hectares and comprises undulating rural land containing several man-made farm dams, drainage depressions and areas of remnant vegetation. The site location and layout are shown on **Figure 1.1** and **Figure 1.2** of this report.

The site is proposed for development under a State Significant Development Application (SSDA) as a data centre campus comprising:

- Approximately 26 shells across four-storeys data centre buildings (4x four shells and 2x five shells), including six technical office buildings, plus a campus office.
- Incoming and internal electrical substations and associated infrastructure.
- Site preparation, including earthworks, stormwater, sewer, roads, and associated infrastructure.

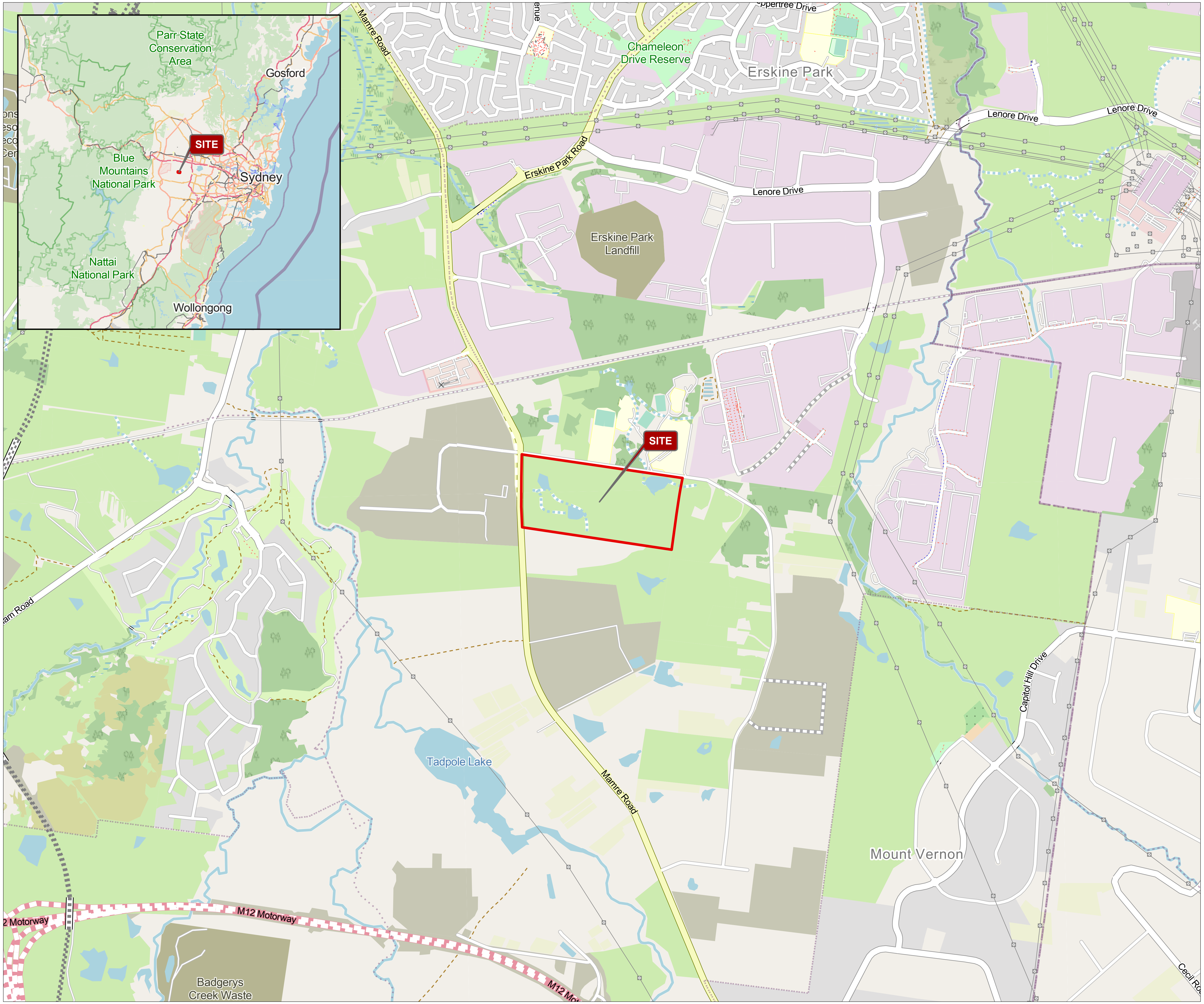
The project will include extensive site preparation works such as bulk earthworks to establish the development platform.

The surface water and groundwater impact assessment has been commissioned to characterise existing hydrological and hydrogeological conditions, interpret recent groundwater and surface water quality data and assess potential impacts arising from the proposed construction and operation of the data centre campus. The assessment has been prepared to support the Environmental Impact Statement and forms part of the broader suite of technical studies being completed for the State Significant Development Application.

The Planning Secretary’s Environmental Assessment Requirements have been issued for SSD 92743706, Mamre Road Data Centre Campus. The relevant SEARs item addressed by this assessment requires an evaluation of potential surface water and groundwater impacts including potential impacts on watercourses, riparian areas, groundwater and groundwater dependent communities in accordance with applicable EPA guidance and the DCCEEW Water Group Groundwater Assessment Toolkit (NSW DCCEEW, 2022). **Table 1.1** identifies the SEARs item addressed by this report.

Table 1.1 SEARs Compliance Table

SEARs Section	Item request	Item Addressed
Water management	An assessment of potential surface water and groundwater impacts associated with the development, including potential impacts on watercourses, riparian areas, groundwater and groundwater dependent communities. The assessment must address both quality and quantity outcomes and be undertaken in accordance with relevant EPA guidance and the DCCEEW Water Group Groundwater Assessment Toolkit.	This report provides a surface water and groundwater impact assessment that evaluates existing hydrological and hydrogeological conditions and assesses potential construction and operational impacts on surface water, groundwater and associated environmental receptors. The assessment has been prepared in accordance with relevant EPA guidelines and the DCCEEW Groundwater Assessment Toolkit and responds to the SEARs requirements for SSD 92743706.



Legend

🟥 Approximate Site Boundary

Job No: 70548	
Client: Plan Project Management	
Version: R01 Rev 1	Date: 04-Nov-2025
Drawn By: AB	Checked By: JC

Scale: 1:25,000 at A3

0 750 1,500
metres

Coord. System: GDA 1994 MGA Zone 56

Lot 1 DP104958
706-752 Mamre Road
Kemps Creek, NSW

SITE LOCATION

FIGURE 1.1

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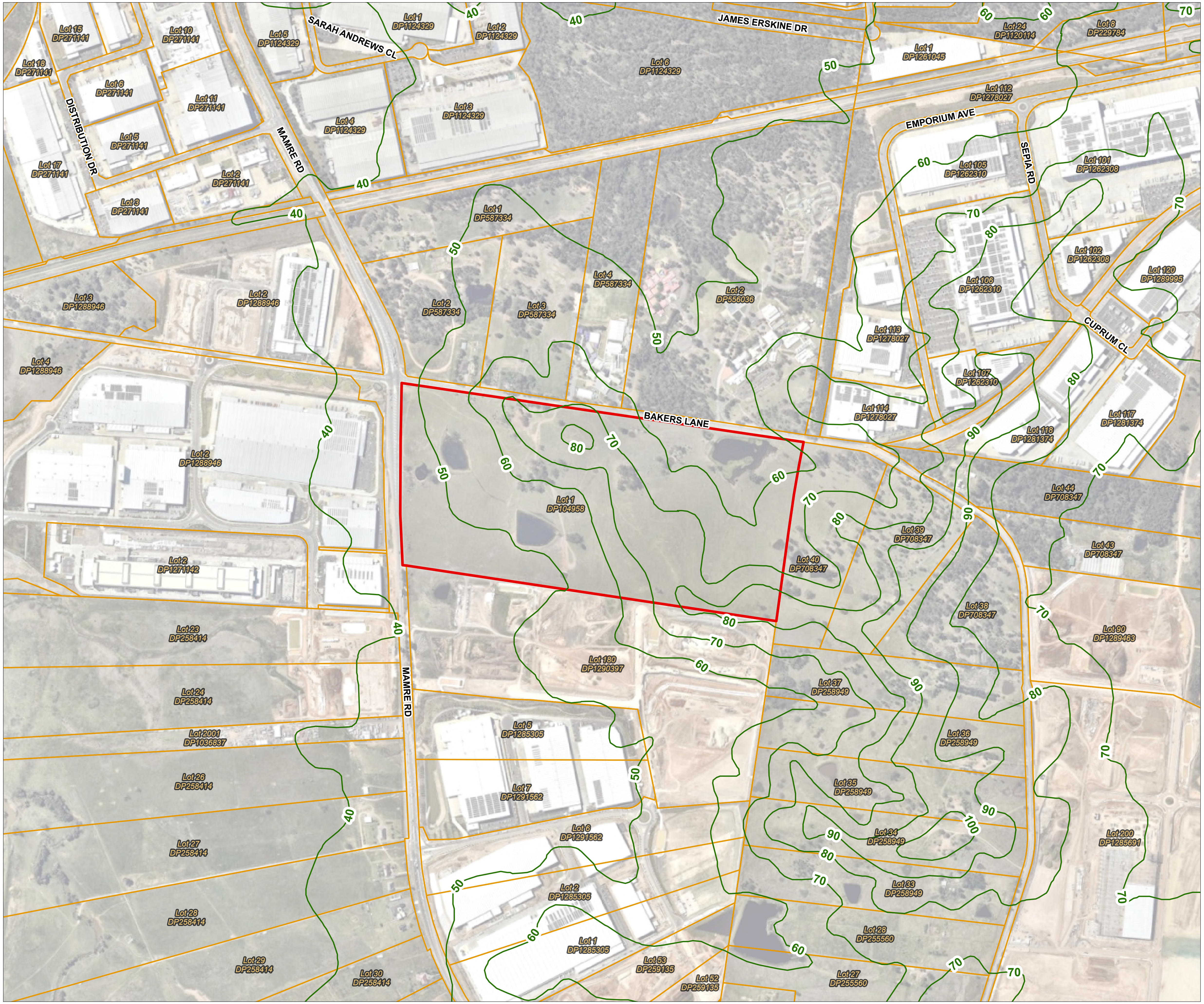
Reference: OpenStreetMap - Accessed Imagery: 04/11/2025



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- 🟥 Approximate Site Boundary
- 🟧 NSW Cadastre
- — Contours

JBS&G

Job No: 70548	
Client: Plan Project Management	
Version: R01 Rev 1	Date: 13-Nov-2025
Drawn By: AB	Checked By: JC
Scale: 1:10,000 at A3	

0 200 400 600
metres

Coord. System: GDA 1994 MGA Zone 56

Lot 1 DP104958
706-752 Mamre Road
Kemps Creek, NSW

SITE LAYOUT

FIGURE 1.2

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

1.3 Proposed Development

The proposed development involves substantial modification of the existing landform to establish a suitable platform for construction of a multi building data centre campus as described in **Section 1.2**. The project requires extensive cut and fill operations, with excavation depths of up to approximately twenty one metres and engineered fill of up to approximately sixteen metres across parts of the site. These works will regrade the natural terrain to achieve consistent development levels that support the structural and civil requirements of the facility. Importantly, no operational basements are proposed as part of the data centre buildings. All structures will be constructed above the final ground surface, supported by engineered foundations and deep piles where required.

Figure 1.2 presents the existing site layout and cadastral boundaries, including Lot 1 Deposited Plan 104958. The topography comprises a central ridge that trends south-east to north-west with peak elevations of about 80 metres Australian Height Datum. Drainage falls away from this ridge toward lower areas located in the southwestern and northeastern parts of the site, where elevations reach approximately 40 to 55 metres Australian Height Datum. The site contains several man-made farm dams and shallow drainage depressions that currently capture and convey overland flow within the property.

The development will include construction of data centre buildings, technical support buildings, internal access roads, hardstand areas, parking, substations and associated utility infrastructure. New drainage and civil works will integrate the site with the Mamre Road Precinct trunk stormwater network. The bulk earthworks phase will precede construction of buildings and services, with works expected to be delivered in staged phases that progress from site preparation and major civil works through to building construction and commissioning.

1.4 Purpose and Objective of the Report

The purpose of this report is to characterise the existing environmental, hydrological and hydrogeological setting of the site and evaluate the potential impacts of the proposed development on surface water and groundwater systems. The assessment identifies relevant environmental receptors and groundwater users, describes the local and regional drainage context and outlines the approach adopted to develop the Hydrogeology - Conceptual Site Model (H-CSM) used to inform the impact assessment.

The objectives of the report are to document baseline surface water and groundwater conditions, interpret available water quality and groundwater level data, and assess the potential effects of the proposed bulk earthworks, construction activities and operation of the data centre campus on water resources. The report evaluates potential impacts on watercourses, riparian areas, shallow groundwater, and any groundwater dependent communities in accordance with applicable EPA guidance and the DCCEEW Water Group Groundwater Assessment Toolkit.

The assessment forms part of the supporting technical documentation for the State Significant Development Application and has been prepared to respond to the Planning Secretary's Environmental Assessment Requirements for water management. The report provides a detailed basis for identifying appropriate mitigation, management and monitoring measures to ensure that potential impacts on surface water and groundwater are minimised and that the development proceeds in a manner consistent with relevant statutory requirements and environmental guidelines.

1.5 Scope of Works

The scope of works for this assessment includes:

- Review of existing project documentation including geotechnical, stormwater, environmental and civil design reports relevant to surface water and groundwater.
- Review and interpretation of recent groundwater and surface water quality data and groundwater level monitoring results.

- Characterisation of the existing hydrological and hydrogeological setting, including topography, drainage features, dams, watercourses, groundwater levels, flow directions and recharge influences.
- Identification of environmental receptors and groundwater users relevant to the proposed development.
- Development of a H-CSM to define existing conditions and provide a basis for assessing potential impacts.
- Assessment of potential impacts on surface water and groundwater associated with bulk earthworks, temporary excavations, altered drainage, construction activities and long-term operation of the data centre campus.
- Evaluation of potential impacts in accordance with applicable EPA guidance and the DCCEEW Water Group Groundwater Assessment Toolkit (DCCEEW, 2022).
- Identification of appropriate mitigation, management and monitoring measures to minimise potential impacts on surface water and groundwater.
- Preparation of this technical report to support the State Significant Development Application and respond to the relevant Planning Secretary's Environmental Assessment Requirements.

2. Legislation, Regulation and Policy

This Section presents governing legislation, regulations, environmental planning instruments, guidance documents and policies relevant to the assessment of surface water and groundwater impacts for the Project.

2.1 Commonwealth Legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

An impact assessment of the proposed development against the EPBC Act was completed (Biosis, 2025). Based on criteria outlined in the Commonwealth of Australia (2013), it was considered unlikely that a significant impact on a MNEW would result from the project, and thus a referral to the commonwealth minister for the Environment and Water would not be required.

2.2 Commonwealth Guidelines and Policy

2.2.1 Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018

Management of water quality for natural and semi natural water resources is guided by the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) issued under the National Water Quality Management Framework. The framework provides a nationally consistent method for identifying environmental values, selecting relevant water quality guidelines, deriving local water quality objectives and designing monitoring programs.

For this assessment, ANZG 2018 has been used as a primary reference for assessing surface water and groundwater quality in the context of downstream environmental values including aquatic ecosystems, secondary contact recreation, stock watering and irrigation, where relevant to the receiving environment.

An assessment of Project water quality against selected ANZG guideline values is presented in **Section 5**.

2.2.2 Australian Drinking Water Guidelines 2011

The Australian Drinking Water Guidelines (NHMRC, 2022) published by the National Health and Medical Research Council provide a framework for the protection of human health where groundwater or surface water is used, or may reasonably be used, as a potable water supply. The guidelines set out health based and aesthetic guideline values and emphasise a risk-based approach to drinking water management from catchment to consumer.

While the Project does not involve the direct supply of drinking water, the ADWG have been considered for context where groundwater or surface water may contribute to potable supplies within the broader Hawkesbury Nepean catchment. Relevant ADWG values have been referenced qualitatively when interpreting groundwater and surface water quality results, as presented in **Section 5**.

2.3 NSW Legislation

2.3.1 Environmental Planning and Assessment Act 1979

State Environmental Planning Policy (Biodiversity and Conservation) 2021

The Environmental Planning and Assessment Act 1979 (NSW) establishes the framework for land use planning and environmental impact assessment in New South Wales. The Project is being progressed as a State Significant Development and requires preparation of an Environmental Impact Statement that responds to the Planning Secretary’s Environmental Assessment Requirements.

This Surface Water and Groundwater Impact Assessment has been prepared to support the State Significant Development Application and to address the water related SEARs for SSD 92743706, Mamre Road Data Centre Campus.

Relevant State Environmental Planning Policies include those dealing with resilience and hazards, biodiversity and conservation and industrial and employment land uses. These instruments provide the strategic and statutory planning context for the development but are not repeated in detail here, except where they intersect with water management, groundwater or riparian considerations.

2.3.2 Protection of the Environment Operations Act 1997

The Protection of the Environment Operations Act 1997 (NSW) provides the primary framework for environmental regulation of air, water and noise emissions in New South Wales and is administered by the NSW Environment Protection Authority and local councils. The Act establishes offences relating to pollution of waters and sets up the environment protection licensing system for scheduled activities.

For this Project, the Act is relevant in relation to the management of any discharges to waters, including stormwater discharges from the developed site and any temporary discharges that may occur during construction. Should an environment protection licence be required for construction or operation, discharge limits and monitoring requirements would be set under the Protection of the Environment Operations Act. This assessment provides input to the design of water management measures intended to ensure that discharges comply with relevant legislative requirements.

2.3.3 Water Management Act 2000

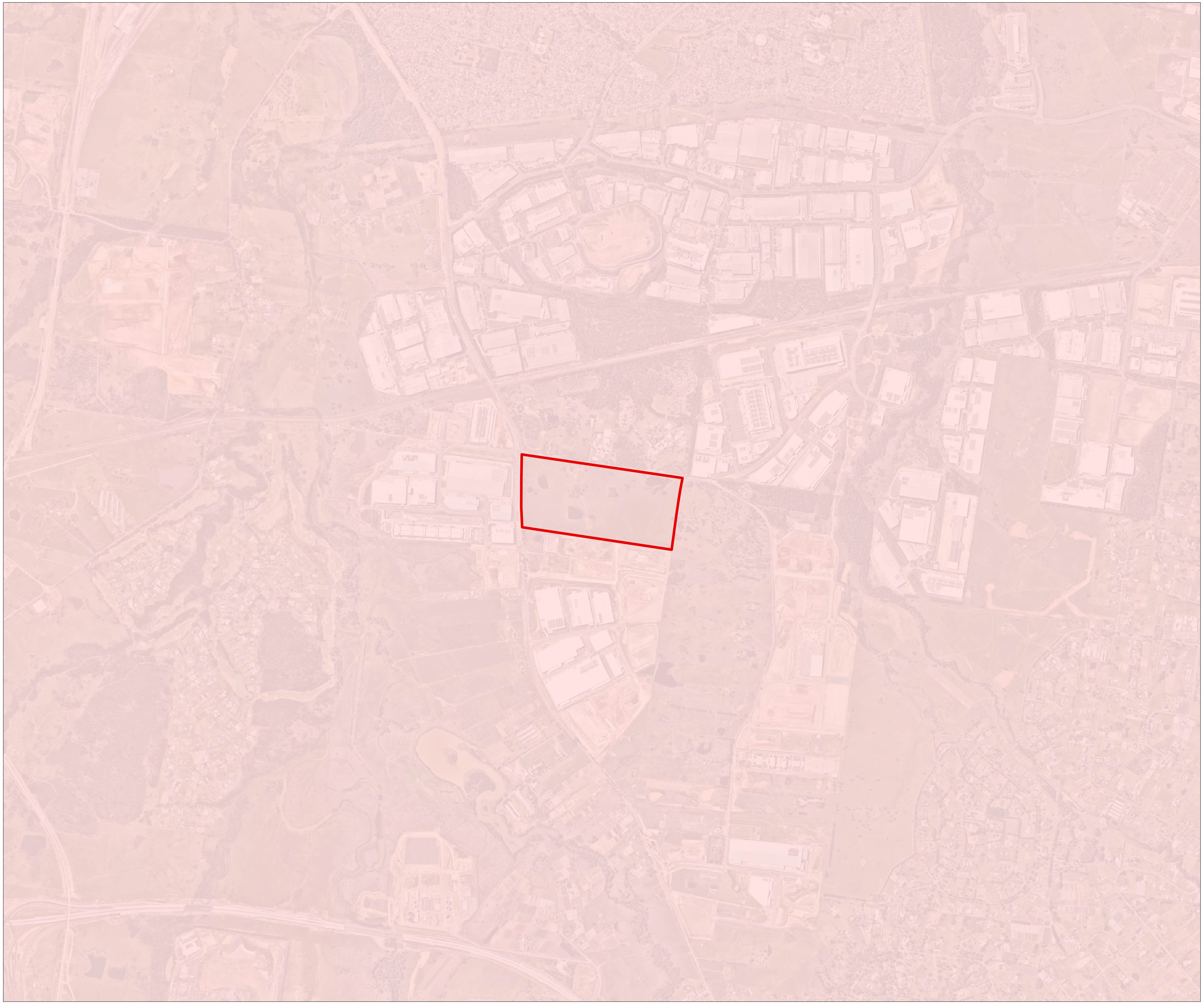
The Water Management Act 2000 (NSW) provides for the sustainable and equitable sharing of surface water and groundwater between users and the environment. The Act is implemented through water sharing plans which define water sources, access rules and long-term extraction limits.

Under the Act, approvals and licences may be required for the construction and use of works that take or interfere with surface water or groundwater, including groundwater dewatering and permanent extraction. In general, the Act requires a water access licence to take water, a water supply works approval to construct a work and a water use approval to use water for a particular purpose.

The site is located within the Hawkesbury Nepean catchment, within water sources covered by the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023 (**Figure 2.1**) and the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2023 (**Figure 2.2**), which includes the Wianamatta South Creek Water Source and associated management zones.

These plans set out rules for groundwater and surface water extraction, including basic landholder rights and licensed extraction.

The Project does not propose ongoing groundwater extraction during operation. Any temporary dewatering required during construction would be managed in accordance with the Water Management Act 2000 and the relevant water sharing plans, and may require works and use approvals depending on volumes and duration. These matters are discussed further in **Section 6**.



Legend

🟥 Approximate Site Boundary

Water Sharing Plan - Groundwater Sources

▨ Greater Metropolitan Region Groundwater Sources 2023 / Lachlan Fold Belt Greater Metropolitan Groundwater Source

JBS&G

Job No: 70548

Client: Plan Project Management

Version: R01 Rev 1

Date: 10-Nov-2025

Drawn By: AB

Checked By: JC

Scale: 1:25,000 at A3

Coord. System: GDA 1994 MGA Zone 56

Lot 1 DP104958
706-752 Mamre Road
Kemps Creek, NSW

WATER SHARING PLAN -
GROUNDWATER SOURCES

FIGURE 2.1

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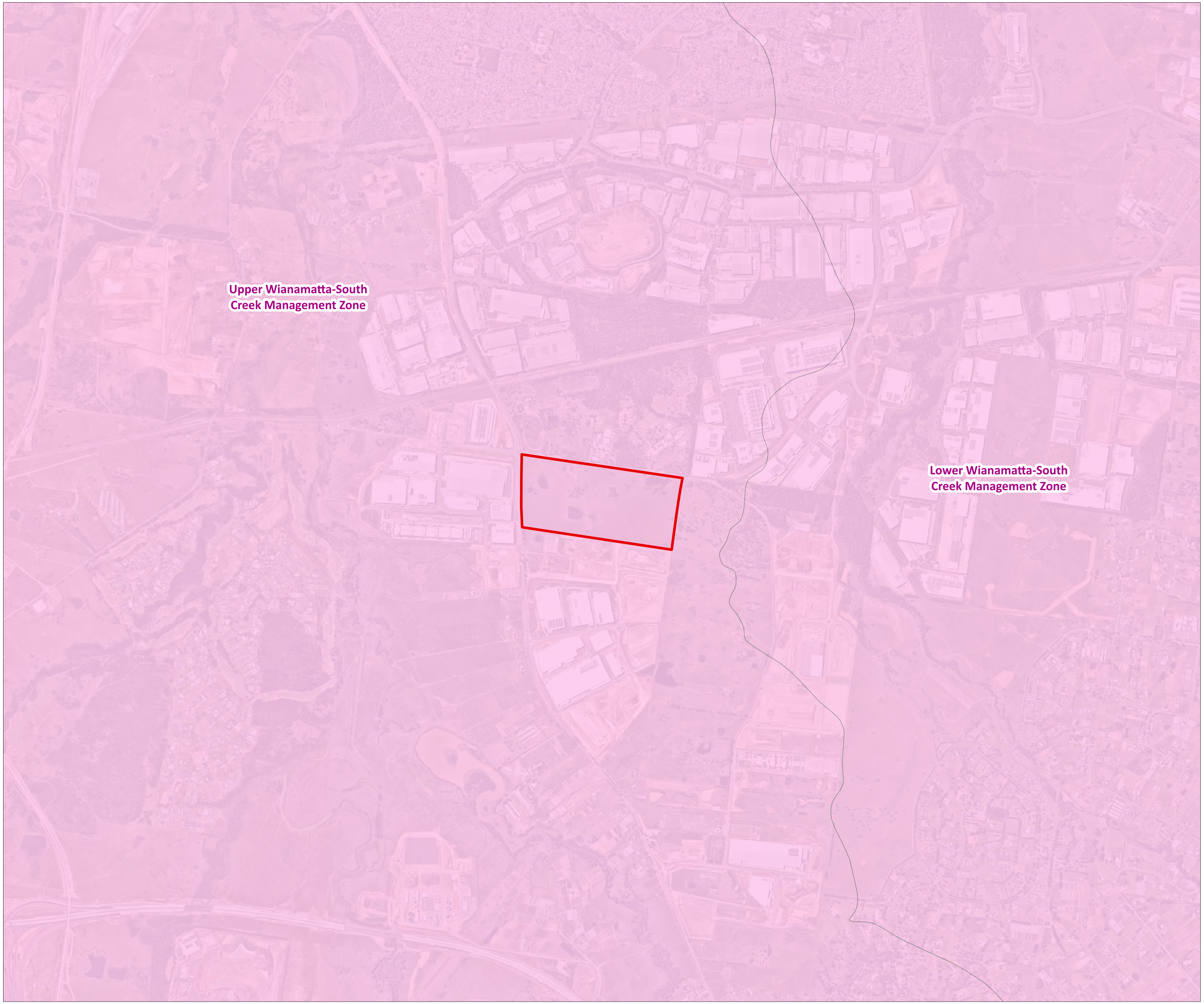

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🟥 Approximate Site Boundary

Water Sharing Plan

▨ Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2023 / Greater Metropolitan Region Unregulated River Water Sources 2023 / Wianamatta-South Creek Water Source

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Job No: 70548	
Client: Plan Project Management	
Version: R01 Rev 1	Date: 10-Nov-2025
Drawn By: AB	Checked By: JC
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Kemps Creek, NSW

WATER SHARING PLAN -
SURFACE WATER

FIGURE 2.2

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

2.3.4 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (NSW) provides for the conservation of biodiversity, including threatened species, populations and ecological communities, and establishes the Biodiversity Offset Scheme. The Act is relevant to this assessment where groundwater or surface water regimes support riparian vegetation, wetlands or potential groundwater dependent ecosystems that may be listed under the Act.

Any potential groundwater dependent ecosystems or riparian habitats associated with drainage lines downstream of the site are considered in the context of groundwater and surface water impacts in **Section 5**.

2.4 NSW Guidelines and Policy

2.4.1 NSW Water Quality and River Flow Objectives 2006

The NSW Water Quality and River Flow Objectives identify environmental values and associated objectives for rivers and catchments in New South Wales, consistent with the National Water Quality Management Framework. The site drains to South Creek within the Hawkesbury Nepean catchment. For this catchment, relevant environmental values include protection of aquatic ecosystems, secondary contact recreation, irrigation, stock watering and visual amenity.

These objectives have been considered qualitatively in assessing the potential impact of the Project on downstream water quality and flow regimes, taking into account the integration of the site stormwater system with the Mamre Road Precinct trunk drainage network. The assessment against these objectives is incorporated into the discussion of surface water impacts in **Section 5**.

2.4.2 Managing Urban Stormwater 2004 & 2008

Erosion and sediment control and construction phase stormwater management are guided by Managing Urban Stormwater: Soils and Construction, Volume 1 (Landcom, 2004) and Volume 2 series (DHI, 2008), collectively known as the Blue Book. These documents provide best practice guidance on erosion and sediment controls, stabilisation, detention and treatment of construction runoff.

The construction environmental management framework and erosion and sediment control measures for the Project are being developed with reference to the Blue Book. This assessment assumes that construction phase controls will be designed and implemented in accordance with these guidelines.

2.4.3 Guidelines on Controlled Activities on Waterfront Land 2012

The Guidelines for Controlled Activities on Waterfront Land (NSW DPE Water, 2012) provide guidance for works within forty metres of a watercourse, lake or estuary, termed waterfront land under the Water Management Act 2000. The guidelines cover design and management of works such as drainage outlets, scour protection, bank stabilisation and crossings to protect riparian function and water quality.

There are no mapped third or higher order watercourses within the site. However, the Project may modify drainage pathways that ultimately discharge to South Creek. The principles in the controlled activity guidelines have been considered in the design of stormwater outlets and drainage interfaces with downstream watercourses, as discussed in **Section 5** and in the stormwater management documentation prepared by AT&L.

2.4.4 NSW Aquifer Interference Policy 2012

The NSW Aquifer Interference Policy sets out requirements for the assessment and management of activities that interfere with aquifers, including excavation, dewatering and permanent groundwater extraction. Key elements of the policy include accounting for all water taken, assessing impacts against minimal impact considerations for water levels, pressures and quality, and implementing monitoring and contingency measures where predicted impacts may be exceeded.

The site overlies groundwater sources governed by the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023.

This assessment has regard to the Level 1 minimal impact considerations under the Aquifer Interference Policy. Given that no long term groundwater extraction is proposed and that bulk earthworks will not involve permanent basements below the water table, the Project is not expected to result in more than minimal harm to the relevant groundwater sources. Assessment against the policy is summarised in **Section 5.**

2.4.5 Groundwater Assessment Toolbox for Major Projects in NSW 2022

The Groundwater Assessment Toolbox for Major Projects in NSW (DCCEEW 2022) provides guidance for the assessment of groundwater impacts associated with State Significant Development and State Significant Infrastructure projects. The toolkit outlines expectations for baseline data collection, conceptual site model development, impact assessment, groundwater modelling and cumulative impact assessment, and clarifies the relationship between major project assessments and the Aquifer Interference Policy.

This assessment has been prepared with reference to the toolbox, including development of a conceptual site model, identification of potential impact pathways and receptors, and evaluation of potential groundwater impacts in the context of the relevant water sharing plans. The approach adopted is described in **Section 3** and **Section 4**, with impact assessment outcomes presented in **Section 5**.

2.4.6 Operational Water Quality Assessment Guideline TfNSW, 2025

The Operational Water Quality Assessment Guideline (Transport for NSW, 2025) provides a structured approach for assessing the water quality impacts of major infrastructure operations and for setting practical pollutant reduction targets. Although the guideline has been developed primarily for transport infrastructure, several of its principles, including the use of pollutant load reduction targets consistent with CSIRO Urban Stormwater Best Practice Environmental Management Guidelines, are applicable to large scale urban developments.

Where appropriate, these principles have been considered in the assessment of operational surface water quality impacts and in the selection of performance objectives for stormwater controls associated with the Project, in conjunction with the stormwater management strategy developed by AT&L.

3. Hydrology and Hydrogeological Setting

This Section presents an overview of the environmental and hydrogeological setting of the Site.

3.1 Background Documents

The following previous site investigations and technical reports were used to inform this report.

- AT&L. 2025a. Mamre Road Data Centre Campus – Water and Stormwater Plan.
- AT&L. 2025b. Mamre Road Data Centre Campus – Earthworks Strategy Report.
- JBS&G, 2025a. 706-752 Mamre Rd Kemps Creek - Detailed Site Investigation.
- JBS&G, 2025b. 706-752 Mamre Rd Kemps Creek – Surface Water and Groundwater Sampling Event.
- PSM, 2025. 706-752 Mamre Road Kemps Creek. Results of Geotechnical Investigation.

3.2 Site Identification

The site is located at 706 to 752 Mamre Road, Kemps Creek, NSW, within the Mamre Road Precinct of the Western Sydney Employment Area. The site covers an area of approximately 52 hectares and is legally identified as Lot 1 Deposited Plan 104958. The site boundary and regional context are shown on **Figure 1.1**, with the existing site layout and surrounding cadastral parcels shown on **Figure 1.2.**

Land use in the surrounding area includes industrial development to the east and south, rural residential properties and creek corridors to the north and west and emerging industrial development within the broader Mamre Road Precinct. Access to the site is currently obtained from Baker Lane along the northern boundary.

3.3 Surrounding Land Use

The current land uses of adjacent properties at the time of investigation are summarised below.

The site is bound to the north by Bakers Lane, beyond which are rural residential properties, pastoral land and areas of remnant vegetation. Local drainage lines that flow toward downstream watercourses are also located to the north of the site.

The site is bound to the south and east by former rural land currently undergoing redevelopment for commercial and industrial purposes, together with other rural residential and pastoral land.

The site is bound to the west by Mamre Road and rural residential properties and pastoral land, with areas of open grazing and scattered vegetation. There are plans for further industrial development.

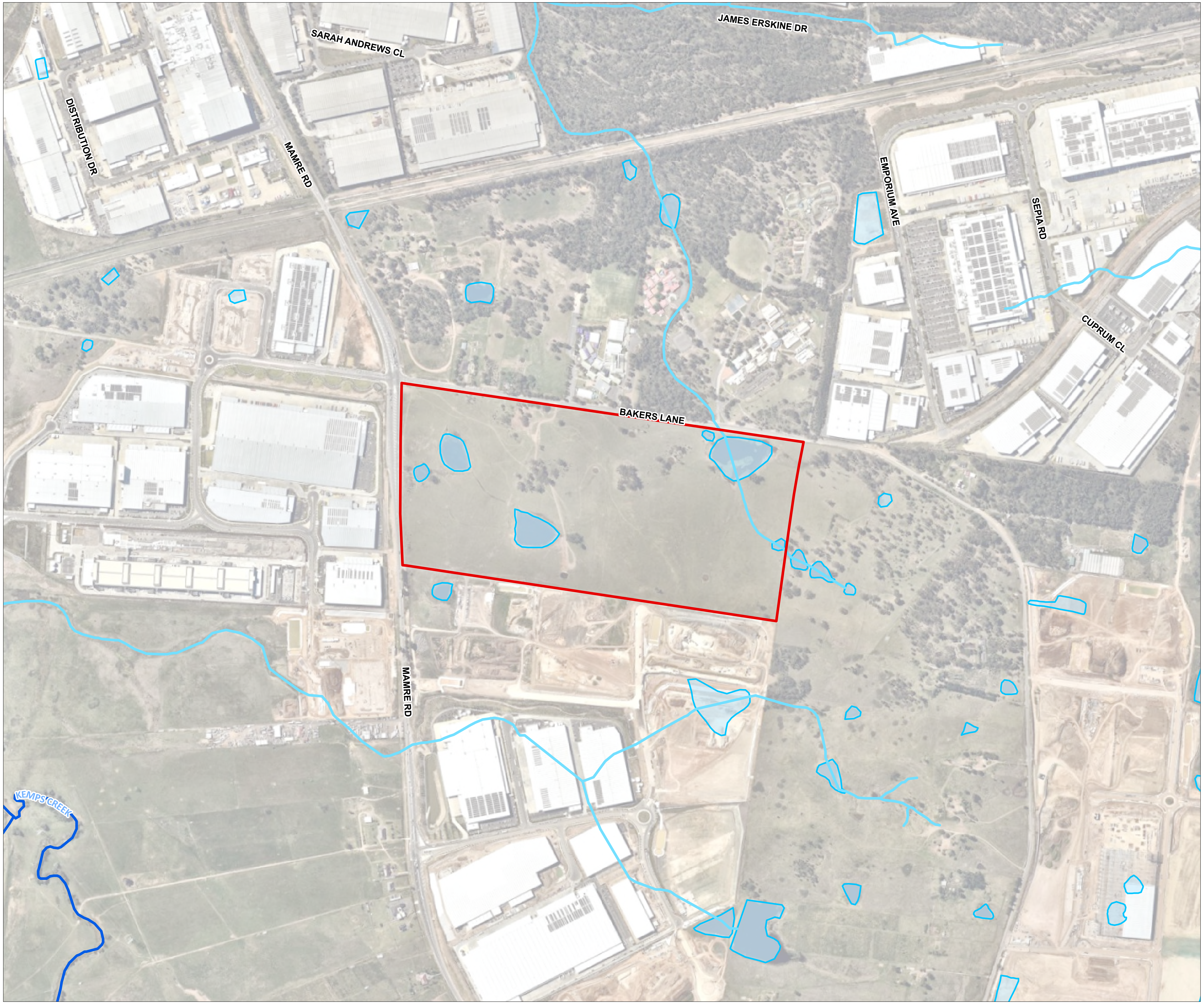
3.4 Topography and Drainage

The site comprises a gently to moderately undulating landform characteristic of the Bringelly Shale landscape. Ground levels range from approximately 40 metres Australian Height Datum in the southwestern portion of the site to about 80 metres Australian Height Datum along a broad ridge that trends southeast to northwest through the central part of the property. This ridge forms the highest elevation on the site and defines the primary surface water flow directions. A map showing local surface water features is presented in **Figure 3.1**.

Surface water runoff drains away from the central ridge toward two lower lying areas. The northeastern portion of the site contains a shallow depression with elevations of approximately 55 metres Australian Height Datum, while a second low point occurs in the southwestern part of the site. Several shallow ephemeral drainage depressions extend downslope from the ridge toward these low points, conveying overland flow during rainfall events.

The site contains three man-made farm dams that intercept local surface runoff. Drainage features within the site have been historically modified by agricultural activities and do not form continuous channels. There are no mapped natural watercourses within the site boundary. Overland flow generated within the site ultimately discharges to downstream drainage lines located outside the property boundary, consistent with the broader South Creek catchment.

The existing drainage regime is therefore defined by localised topographic depressions, internally draining catchments and modified farm dams, with flow pathways closely controlled by the natural landform and historic rural land use.



Legend

□ Approximate Site Boundary

□ Hydro Area

Hydro Lines

— Perennial

— Non Perennial

JBS&G

Job No: 70548	
Client: Plan Project Management	
Version: R01 Rev 1	Date: 13-Nov-2025
Drawn By: AB	Checked By: JC
Scale: 1:10,000 at A3	

0 100 200 300 400 500 600
metres

Coord. System: GDA 1994 MGA Zone 56

Lot 1 DP104958
706-752 Mamre Road
Kemps Creek, NSW

SURFACE WATER FEATURES

FIGURE 3.1

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.5 Rainfall

The climate of the region is temperate, characterised by warm summers, mild winters and relatively uniform rainfall distributed throughout the year. Rainfall data for the locality was obtained from Bureau of Meteorology rainfall station 066037, which provides long term average monthly and annual rainfall records representative of the regional climatic conditions.

A summary of average rainfall is presented in Table 3.1.

Table 3.1: Rainfall and FAO56 Monthly Average (mm)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall Mean	94.7	117.6	122.9	107.8	98.4	123.0	72.5	77.4	59.8	71.3	81.0	73.0	1099.9

3.6 Hydrology

Surface water hydrology at the site is controlled by the natural undulating landform and the presence of several man made farm dams that intercept local runoff. The central ridge that trends south east to north west through the property divides the site into two principal internal catchments, directing overland flow toward the lower lying areas in the north eastern and south western portions of the site.

Shallow ephemeral drainage depressions extend downslope from the ridgeline and convey surface water during rainfall events. These features have been historically modified by agricultural activities and do not form continuous or defined natural watercourses within the site boundary. Flow paths are generally short in length and terminate at one of the three farm dams or in shallow localised depressions.

The AT&L water management assessment notes that no perennial or second or third order watercourses occur within the site. Mapped hydrolines within the property comprise minor first order features that have been altered through dam construction and rural land use. Surface water generated within the site drains toward downstream tributaries located outside the property boundary, which ultimately form part of the South Creek subcatchment.

The existing hydrological regime is therefore characterised by internally draining catchments, intermittent overland flow, disconnected ephemeral drainage features and man made dams that temporarily store runoff. These conditions form the baseline for assessing potential changes to surface water movement, runoff volumes and drainage connectivity associated with the proposed development.

3.7 Geology and Soils

A map of the regional surface geology is presented **Figure 3.2**. In Reference to the 1:100,000 Penrith Geological Map (Clarke and Jones 1991) indicates that the site is predominantly underlain by Bringelly Shale, which forms the upper formation of the Wianamatta Group. Bringelly Shale typically comprises alternating layers of shale, carbonaceous clay, laminite and minor coal seams. These units form the characteristic low permeability bedrock observed across the site and are consistent with the geotechnical conditions encountered during the PSM geotechnical investigation (PSM, 2025).

Localised Quaternary deposits comprising fluvial sand, silt and clay may occur in areas associated with historical drainage lines and low lying depressions. These deposits are generally shallow and discontinuous and reflect reworking of surface materials due to past agricultural activities and natural erosion processes. Surficial soils include topsoil and residual clays derived from the weathering of shale bedrock. The residual profile observed in boreholes typically includes natural clay materials transitioning to weathered shale within the upper several metres of the subsurface.

Reference to the eSPADE NSW Soil and Land Information Database (OEH 2019) indicates that the site is underlain by two soil landscape units: the Luddenham Soil Landscape in the eastern portion of the site and the Blacktown Soil Landscape in the western portion.

Quarrying occurs in the Devonian Lambie Group, which according to the 1:250,000 scale Geological Map Sheet (Sydney 3rd Ed) is unit "Dul" and comprises quartzite, sandstone, siltstone and claystone.

Table 3.2: Soil Landscapes within the Investigation Area

Soil Landscape	Geology	Landscape Type	Position	Vegetation	Soil Material	Limitations
Luddenham (lu)	Wianamatta Group Ashfield Shale and Bringelly Shale.	Erosional	Undulating to rolling hills	Cleared Eucalypt woodland, tall open forest (dry schlerophyll)	Shallow dark podzolic soils on crests, moderately deep red podzolic soils on upper slopes, yellow podzolic and prairie soils on lower slopes and drainage lines	Water erosion hazard, localised steep slopes, localised mass movement hazard, localised surface movement potential, moderately reactive, localised impermeable highly plastic subsoil

Legend

🟥 Approximate Site Boundary

Surface Geology

▨ Qa - Alluvium, gravel, sand, silt and clay

▨ Rwl - Shale with some sandstone beds

▨ Tv - Basalt, dolerite, volcanic breccia etc.

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Version: R01 Rev 1

Date: 13-Nov-2025

Drawn By: AB

Checked By: JC

Scale: 1:25,000 at A3

0 500 1,000 1,500

metres

Coord. System: GDA 1994 MGA Zone 56

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SURFACE GEOLOGY

FIGURE 3.2

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.8 Hydrogeology

3.8.1 Registered Groundwater Works

Licensed groundwater bore information was obtained from the Water NSW groundwater mapping portal (Water NSW 2020[1]). A review of the licensed bore information indicated that there are three groundwater monitoring wells within 1 km radius of the site all situated within the newly developed commercial/industrial area to the north **Figure 3.3**: State Groundwater Works Search. Groundwater bore locations in relation to site are provided in **Table 3.3**.

Table 3.3: Groundwater Monitoring Bores (State)

Bore ID	Distance from Site	Use	Standing Water Level	Well Depth	Reported Lithology
GW110029	1.24 km north	Monitoring Bore	-	0.75 m below ground surface (bgs)	Topsoil to 0.20 m bgs; Silty Clay to 0.50 m bgs; Clay to 0.75 m bgs
GW110030	1.01 km north	Monitoring Bore	-	0.75 m bgs	Topsoil to 0.20 m bgs; Silty Clay to 0.60 m bgs; Clay to 0.75 m bgs
GW110031	0.90 km north	Monitoring Bore	-	0.75 m bgs	Topsoil to 0.20 m bgs; Silty Clay to 0.40 m bgs; Clay to 0.75 m bgs

Perched (saline) groundwater may be present within localised (shallow) filled areas and generally within the soils in the lower landscape above shale bedrock. Saline groundwater is also anticipated at relatively shallow depths in the lower landscape portions of the site, hosted by fracturing / jointing of the Wianamatta Shales, albeit limited in extent. Given the site is underlain by low permeability clays and shales, the potential for groundwater movement is likely to be low.

The potential for drinking water use and stock watering would be limited due to the saline nature of groundwater.

---

[1] Water NSW, 2019. Groundwater Monitoring Overview Map. https://realtimedata.waternsw.com.au/. Accessed 22 October 2020.

Legend

🟥 Approximate Site Boundary

🟦 Search Radius 1km

Monitoring Locations

- ● Monitoring
- ● Unknown
- ● Commercial and Industrial

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Scale: 1:25,000 at A3	

0 500 1,000 1,500
metres

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GROUNDWATER AND SURFACE WATER MONITORING NETWORK

FIGURE 3.3

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.8.2 Groundwater Dependent Ecosystems

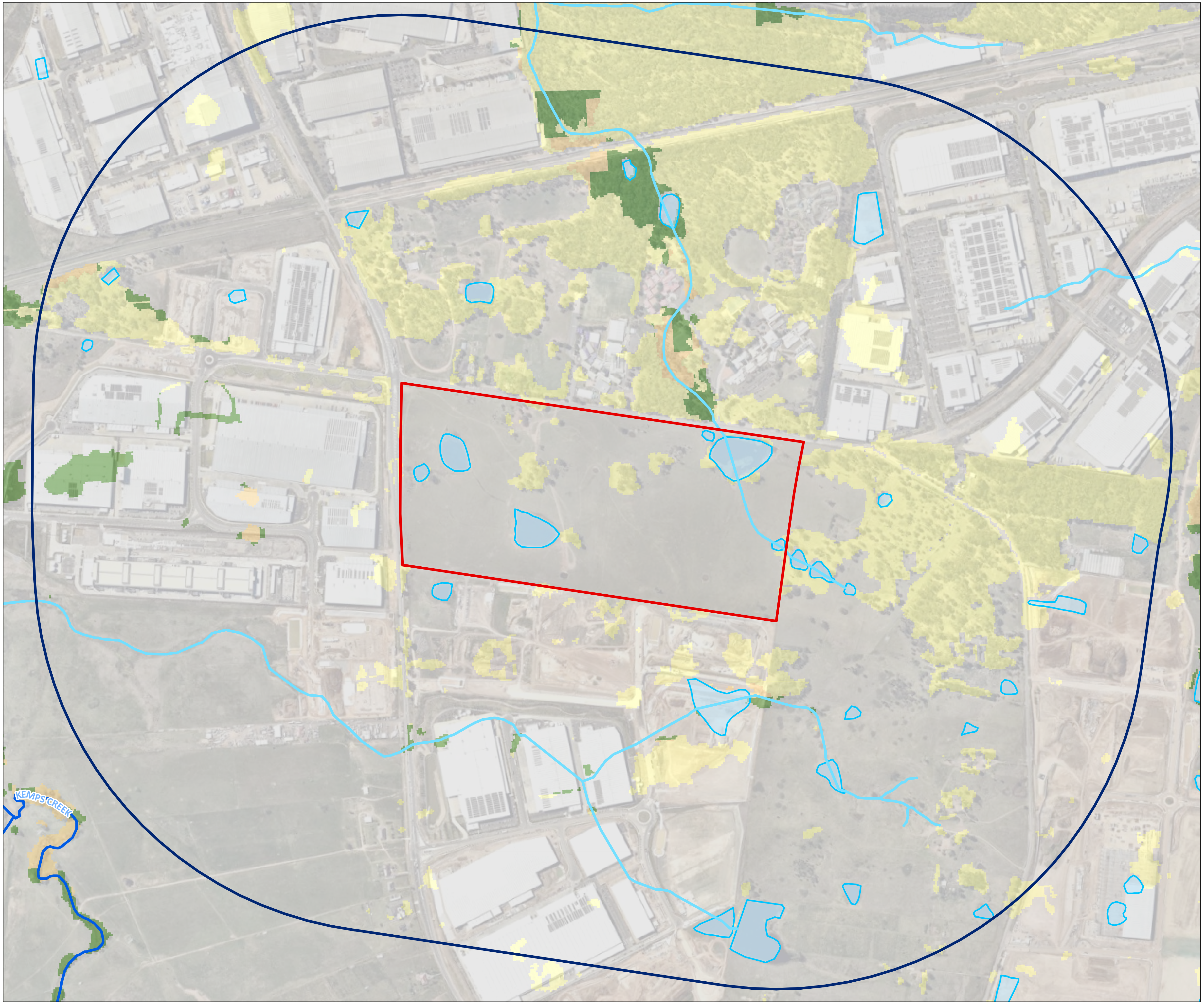
The Bureau of Meteorology Groundwater Dependent Ecosystem Atlas was reviewed, and the following potential groundwater dependent ecosystems were noted as per **Figure 3.4**

- Several low probability GDE’s were noted on site.
- Several low, medium, and high probability GDE’s were noted north of the site that appear to follow the ephemeral watercourse . It should be noted these are located downgradient of the proposed bulk excavation level (BEL).

These potential groundwater dependent ecosystems are not ground-truthed and are based on Geographical Information System (GIS) desktop mapping only. **Figure 3.8** presents the distribution of potential groundwater dependent ecosystems.

Assessment of the potential for the subject land to support groundwater dependant ecosystems (GDEs) was undertaken using the Australian Government’s Bureau of Meteorology Groundwater Dependant Ecosystems Atlas (BOM 2019). The subject land is not mapped as supporting GDEs associated with an aquifer in Appendix 8 of the Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012). The subject land is not mapped as having Groundwater Vulnerability (MRP DCP 2021 and WSEA)

The Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2023 (NSW) was also reviewed and there are no high-priority groundwater dependent ecosystems listed in the relevant schedule of the water sharing noted in the vicinity of the Site.



Legend

- 🟥 Approximate Site Boundary
- ▭ Search Radius 1km
- ▭ Hydro Area

Hydro Lines

- — Perennial
- — Non Perennial

Water/GDE_Probability_NSW

GDE Probability

- 🟩 High
- 🟧 Medium
- 🟨 Low
- ⬜ Non native vegetation

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Client: Plan Project Management	
Version: R01 Rev 1	Date: 13-Nov-2025
Drawn By: AB	Checked By: JC
Scale: 1:10,000 at A3	

0 200 400 600

metres

Coord. System: GDA 1994 MGA Zone 56

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GROUNDWATER DEPENDENT ECOSYSTEMS

FIGURE 3.4

File Name: C:\Users\Abiskupovic\JBS&G Australia\DCS - Internal - V2\Projects\Plan Project Management\70548 Mamre Rd Kemps Creek\Proposal\GIS\02_MapProjects\70548_MamreRdKempsCreek_R01_Rev1.aprx
Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.8.3 Previous Site Investigations

Subsurface conditions across the site have been characterised through a series of geotechnical investigations undertaken by PSM between 2020 and 2025 and environmental investigations undertaken by JBS&G in 2025. These investigations include boreholes, cone penetration tests and installation of groundwater monitoring wells and provide detailed information on soil and rock stratigraphy, depth to weathered shale, groundwater levels and material properties relevant to the hydrological and hydrogeological assessment.

The geotechnical investigations were reported in PSM document (PSM, 2025)

These investigations detail the drilled boreholes, geological units and engineering classification of subsurface materials. These investigations identified a consistent profile comprising shallow topsoil overlying natural clay soils and weathered shale bedrock, with Bedrock Units A, B and C encountered at varying depths depending on local topography. End of hole depths range from approximately 41 metres to 78 metres Australian Height Datum, with deeper weathering profiles occurring in lower lying areas.

Two groundwater monitoring wells (MW01 and MW02) were installed as part of a previous environmental investigations, along with recent groundwater monitoring data from newly installed geotechnical boreholes BH101 and BH102 which contain groundwater data loggers. Groundwater levels vary significantly across the site, ranging from shallow groundwater at approximately 1.2 metres below ground level in low lying areas to more than 15 metres below ground level on mid slope and ridge locations.

A summary of boreholes, monitoring wells and associated geological and groundwater information is presented in **Table 3.4**. This table incorporates collar elevation, interpreted soil and bedrock units and groundwater level information derived from PSM geotechnical drilling and JBS&G environmental monitoring.

These data confirm the presence of residual clay soils transitioning to weathered shale consistent with the Bringelly Shale formation and indicate that groundwater is locally influenced by surface topography, with shallower groundwater occurring in depressions and deeper groundwater beneath elevated areas. The borehole and monitoring network data have been used to inform the development of the Conceptual Site Model and subsequent assessment of potential groundwater impacts associated with the proposed development.

Table 3.4: Previous Ground Investigations Summary

ID	Easting (GDA94, z56)	Northing (GDA94, z56)	Collar RL (m AHD)	Topsoil (m)	Natural Soil (m)	Bedrock A (m)	Bedrock B (m)	Bedrock C (m)	End of Hole (m AHD)	GWL Depth (m)	GWL RL (m AHD)	Data Logger
AH01	295049.2	6254167	74.5	74.5–74.4	74.4–72.6	72.6–68.5	–	–	68.5	–	–	No
AH02	295212.2	6254151	72.7	72.7–72.6	72.6–71.0	71.0–66.7	–	–	66.7	–	–	No
AH03	295277.6	6253970	73	73.0–72.8	72.8–71.8	71.8–67.0	–	–	67	–	–	No
AH04	295689.3	6253898	63.3	63.3–63.2	63.2–60.7	60.7–57.3	–	–	57.3	–	–	No
AH05	295237	6253839	65.6	65.6–65.5	65.5–63.8	63.8–59.6	–	–	59.6	–	–	No
AH06	294723.4	6253915	46.6	46.6–46.5	46.5–45.0	45.0–41.4	–	–	41.4	–	–	No
CH01	295669.4	6253678	85.7	85.7–85.6	85.6–85.1	85.1–82.6	82.6–74.8	–	74.8	–	–	No
CH02	295350.6	6253927	73.5	73.5–73.3	73.3–71.6	71.6–66.1	66.1–63.3	–	63.3	–	–	No
CH03	294940.6	6254151	63.5	63.5–63.4	63.4–61.5	61.5–57.5	57.5–54.0	54.0–53.0	53	–	–	No
CPT01	–	–	47.2	47.2–47.1	47.1–42.3	42.3*	–	–	42.3	–	–	No
CPT02	–	–	43.7	43.7–43.5	43.5–37.1	37.1*	–	–	37.1	–	–	No
CPT03	–	–	51.6	51.6–51.5	51.5–46.8	46.8*	–	–	46.8	–	–	No
CPT04	–	–	67.6	67.6–67.5	67.5–62.6	62.6*	–	–	62.6	–	–	No
CPT05	–	–	58.7	58.7–58.5	58.5–54.4	54.4*	–	–	54.4	–	–	No
CPT06	–	–	57.7	57.7–57.5	57.5–51.6	51.6*	–	–	51.6	–	–	No
BH01	295135.4	6254152	82	82.0–81.9	81.9–80.5	80.5–70.2	70.2–64.4	64.4–61.4	61.4	–	–	No
BH02	295368.8	6253842	81	81.0–80.9	80.9–80.2	80.2–71.3	71.3–65.8	65.8–64.3	64.3	–	–	No
BH03	295256	6254060	74	74.0–73.9	73.9–73.2	73.2–67.7	67.7–62.6	62.6–61.0	61	–	–	No
BH101	295195	6254129	75.5	75.5–75.3	75.3–73.6	73.6–68.1	68.1–64.7	64.7–59.4	59.4	**15.2**	**60.3**	Yes
BH102	295404	6253793	78.3	78.3–78.1	78.1–73.8	73.8–71.0	71.0–68.8	68.8–66.1	66.1	**10.6**	**67.7**	Yes
MW01	*Table 3.5*	*Table 3.5*	83.2	–	–	–	–	–	–	**15.5**	**67.7**	No
MW02	*Table 3.5*	*Table 3.5*	*59.6*	–	–	–	–	–	–	**1.2**	**58.4**	No

3.8.4 Interpreted Hydrogeological Units

The hydrogeological regime at the site is interpreted from the PSM geotechnical investigations (PSM4252-003L REV5; PSM5872 series) and groundwater monitoring data obtained from MW01, MW02, BH101 and BH102. On this basis, two main hydrogeological systems are defined.

Shallow Unconfined Aquitard

The shallow groundwater system comprises the residual soil profile and the underlying weathered shale units designated as Bedrock Units A and B. Together these materials form a single unconfined aquitard characterised by:

- Residual clays and topsoil of low permeability overlying highly to moderately weathered shale.
- Groundwater occurring under unconfined conditions within the combined residual and weathered shale profile.
- Local variations in groundwater depth controlled by topography, with shallow groundwater in low lying areas (for example at MW02, 1.2 metres below ground level) and deeper groundwater beneath mid slope and ridge locations (for example MW01, BH101 and BH102).
- Very low hydraulic conductivity, with groundwater movement primarily through minor fractures, partings and small pore spaces rather than through a laterally extensive productive aquifer.
- Within this unit, perched behaviour may occur locally where thin lower permeability layers inhibit vertical percolation, but these perched conditions are considered part of the same shallow unconfined aquitard system rather than a separate aquifer.

Deep Aquiclude

Beneath the shallow unconfined aquitard, Bedrock Unit C comprises less weathered to relatively fresh shale and siltstone that behaves as a deep aquiclude. This unit is characterised by:

- Very low primary permeability and limited secondary porosity.
- Negligible capacity to transmit groundwater under typical site conditions.
- Functioning as the effective hydraulic base of the shallow groundwater system, with downward migration of groundwater significantly restricted at the transition into Unit C.

Hydrogeological Significance

The site is therefore characterised by a single shallow unconfined aquitard hosted within residual soils and weathered shale (Units A and B), underlain by a deep shale aquiclude represented by Unit C. Groundwater occurs only within the shallow unconfined aquitard, is of low yield and is strongly controlled by surface topography and the weathering profile. These conditions have been adopted in the development of the Conceptual Site Model and the assessment of potential groundwater impacts associated with the proposed development (**Section 4**).

3.8.5 Groundwater Monitoring Network

Groundwater and surface water conditions at the site have been characterised through historical contamination assessments, groundwater bore installation works and the targeted 2025 groundwater and surface water monitoring event. The monitoring network comprises groundwater bores installed by PSM, existing groundwater wells discovered during geotechnical works, and three surface water monitoring locations associated with the onsite dams. The current groundwater and surface water monitoring network is shown in **Figure 3.5**.

Groundwater Monitoring Network

Three historical monitoring wells (MW01 JBSG, MW02 JBSG, MW03 JBSG) were installed as part of the JBS&G Detailed Site Investigation (JBS&G, 2025a). All three wells were identified as dry and did not provide groundwater level or quality data. These wells are not part of the active monitoring network.

Two groundwater monitoring bores, BH101 and BH102, were installed by PSM (PSM, 2025) and contain standing groundwater. These bores also include groundwater dataloggers and were sampled during the 2025 monitoring event.

Two additional pre-existing groundwater wells located by PSM are included in the active network and are designated MW01 and MW02 for the current assessment. These wells provided groundwater for sampling during the 2025 monitoring event.

Groundwater monitoring at the site is undertaken through a combination of environmental monitoring wells and geotechnical boreholes fitted with data loggers. The current monitoring network comprises two environmental monitoring wells (MW01 and MW02) and two geotechnical boreholes with groundwater instrumentation (BH101 and BH102). These locations provide groundwater level data, allow assessment of shallow groundwater behaviour and support development of the hydrogeological Conceptual Site Model.

A summary of the monitoring locations and available construction details is presented in Table 3.5.

Table 3.5: Groundwater Monitoring Network

Monitoring Bore ID	**Easting** (GDA2020, Z56)	**Northing** (GDA2020, Z56)	**Top of Casing (m AHD)**	**Borehole Depth (m BGL))**	**Screened Interval (m BGL)**
MW01	295135	6254149	83.2	20	Unknown
MW02	295622	6253964	59.6	8.1	
BH101	295201	6254127	75.5	16.1	13.0 to 16.0
BH102	295408	6253791	78.3	12.3	9.2 to 12.2

Legend

🟥 Approximate Site Boundary

Sample Locations

◐ Groundwater (GW elevation mAHD)

◎ Surface Water

◓ Borehole

Job No: 70548	
Client: Plan Project Management	
Version: R01 Rev 1	Date: 17-Nov-2025
Drawn By: AB	Checked By: JC
Scale: 1:5,000 at A3	

0 100 200 300

metres

Coord. System: GDA 1994 MGA Zone 56

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Kemps Creek, NSW

GROUNDWATER MONITORING NETWORK

FIGURE 3.5

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.8.6 Groundwater Level and Flow Direction

Groundwater Level

Groundwater levels across the site were assessed using depth-to-water measurements collected on 4 November 2025 from MW01 and MW02, supplemented by continuous logger data from BH101 and BH102 recorded between 3 and 17 October 2025 (PSM5872-005R, Appendix G). All bores monitor groundwater within the shallow unconfined aquitard, comprising the residual soil zone and weathered shale units (Units A and B). The deep shale (Unit C) functions as an aquiclude and does not form part of the active groundwater system.

Groundwater Levels

Measured groundwater levels indicate a subdued water table that broadly reflects site topography, with shallower depths in low-lying areas and deeper groundwater beneath elevated terrain.

MW02 is located immediately adjacent to an on-site farm dam. The recorded water level closely corresponds to the dam water level rather than the broader shallow aquitard. Accordingly, MW02 is not considered representative of the natural groundwater table and is excluded from gradient and flow interpretation.

Groundwater elevations measured across the network are summarised in **Table 3.6**

Table 3.6: Groundwater Level Monitoring

ID	Easting	Northing	GWL Depth (m)	GWL RL (m AHD)	Data Logger	Unit Monitored
MW01			15.5	67.7		Shallow Aquitard
MW02			1.2	58.4		Shallow Aquitard
BH101	295195	6254129	15.2	60.3	Yes	Shallow Aquitard
BH102	295404	6253793	10.6	67.7	Yes	Shallow Aquitard

Groundwater Level Hydrographs

Groundwater level hydrographs were produced from logger data by PSM (PSM, 2025). These demonstrate:

- Stable groundwater levels (fluctuation <0.3 m).
- Minimal short-term response to rainfall.
- Groundwater positioned immediately above the Unit C aquiclude.
- Groundwater level movement characteristic of a low-permeability shale aquitard.

These results are consistent with the conceptual groundwater model, where flow is slow, storage is low, and recharge is limited by clay-rich weathered shale.

Only two weeks of continuous groundwater hydrograph data were available for BH101 and BH102. This dataset is adequate for confirming short-term stability but is insufficient to define seasonal groundwater behaviour, including:

- Wet-season recharge.
- Dry-season drawdown.
- Responses to high-intensity rainfall.
- Long-term variability in aquitard storage.

Ongoing monitoring will be required prior to construction to establish seasonal trends and refine the baseline groundwater regime. This is not required before SSDA lodgement, however should be implemented ideally one year prior to construction commencing.

Groundwater Flow Direction

All active groundwater monitoring locations (MW01, MW02, BH101 and BH102) are situated on, or immediately adjacent to, the elevated central ridge within the site. As such, no direct groundwater level data were obtained from the lower-lying areas to the north-east or south-west where groundwater is expected to drain. This limits the ability to calculate hydraulic gradients solely from groundwater monitoring wells.

To overcome this, the interpretation of the groundwater elevation surface has been guided by:

- Measured groundwater levels from ridge-top bores.
- Geotechnical borehole information at lower elevations, which provided depths to the Unit B–C interface.
- Site topography.
- The expected behaviour of shallow aquitards within the Bringelly Shale.

These deeper geotechnical control points confirm that the Unit C aquiclude becomes shallower toward the lower parts of the site. As a result, the water table is interpreted to gently rise toward lower ground surface elevations, consistent with a shallow aquitard “draped” over an upward rising aquiclude.

This behaviour is typical of:

- low-yield fractured shale aquitards.
- minimal vertical recharge.
- water tables controlled primarily by the depth to the underlying aquiclude rather than surface elevation alone.

Based on the combined monitoring data, geotechnical control points, and interpreted aquiclude geometry, groundwater flow is inferred to be:

- North-east, toward the drainage line near Bakers Lane; and
- South-west, toward the internal low-lying depression within the southern portion of the site.

These flow directions are consistent with a subdued, topographically influenced groundwater table within an unproductive shale aquitard system.

.

Legend

🟥 Approximate Site Boundary

— Groundwater Elevation (mAHD)

JBS&G

Job No: 70548

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Version: R01 Rev 1	Date: 18-Nov-2025
Drawn By: AB	Checked By: JC

Scale: 1:5,000 at A3

0 100 200 300
metres

Coord. System: GDA 1994 MGA Zone 56

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GROUNDWATER ELEVATION CONTOURS

FIGURE 3.6

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Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

3.8.7 Groundwater Quality

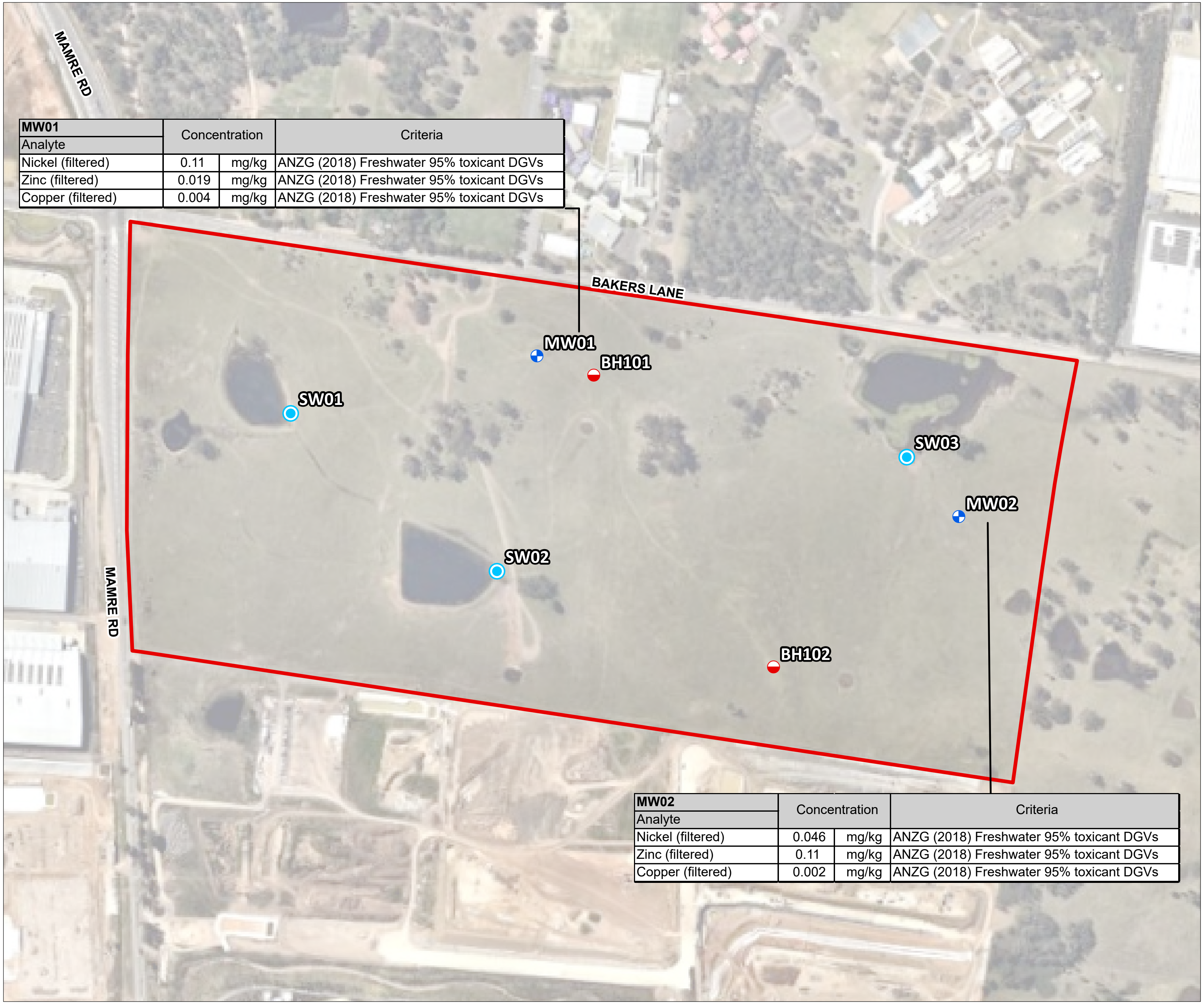
Groundwater quality at the site was characterised using samples collected from monitoring wells MW01 and MW02 and geotechnical boreholes BH101 and BH102 on 4 November 2025, as documented in Appendix A - JBS&G (2025b). Sampling was undertaken using low flow techniques with stabilised field parameters and analysed by NATA accredited laboratories. Quality assurance and quality control results were considered acceptable for the intended use of the data.

Field measurements indicated mildly acidic to near neutral pH (approximately 6.7 to 6.9), low dissolved oxygen and redox conditions consistent with a reducing groundwater environment. Electrical conductivity values ranged from brackish to moderately saline, which is consistent with groundwater hosted within shale units of the Wianamatta Group in Western Sydney. Groundwater was generally clear to slightly turbid with no visible sheen, with the exception of BH102 where grey to black, turbid water with a hydrogen sulphide odour and organic debris was observed.

Laboratory results were compared to the ANZG (2018) 95 percent protection of freshwater aquatic ecosystems. With the exception of a limited number of metals, all analytes were below adopted ecological criteria. Exceedances of the ANZG guidelines were reported for nickel, zinc, aluminium and copper at one or more locations, including both environmental monitoring wells and geotechnical boreholes. All concentrations of PAHs, TRH, BTEX, reactive phosphorus, fluoride, ammonia, nitrate and nitrite were below laboratory limits of reporting or adopted assessment criteria.

Total dissolved solids ranged from approximately 1 700 milligrams per litre to 13 000 milligrams per litre, consistent with salinity values typically reported for shallow groundwater in the regional shale sequence. Major ion chemistry, assessed using a Piper diagram (Appendix A), indicates that the groundwater is dominated by sodium chloride type water.

The pattern and magnitude of metal concentrations are considered to reflect natural background conditions associated with the Bringelly Shale and the surrounding rural and urban land use, rather than indicating a discrete contaminant source. These minor exceedances have been plotted in (**Figure 3.7**). Minor exceedances were detected in MW01 and MW02 for nickel, zinc, and copper. For the purposes of this assessment, the 2025 groundwater monitoring results are taken to represent baseline groundwater quality within the shallow unconfined aquitard at the site. These data are used in subsequent sections to inform the Conceptual Site Model and to assess the potential for the proposed development to alter groundwater quality or mobilise existing constituents.



MW01 Analyte	Concentration		Criteria
Nickel (filtered)	0.11	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Zinc (filtered)	0.019	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Copper (filtered)	0.004	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

MW02 Analyte	Concentration		Criteria
Nickel (filtered)	0.046	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Zinc (filtered)	0.11	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Copper (filtered)	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: L02 Rev A
Date 17/11/2025

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Checked By: JC

Scale 1:6,000

0 50 100
metres

Coord. Sys. GDA 1994 MGA Zone 56

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GROUNDWATER QUALITY RESULTS

FIGURE 3.7

File Name: 70548_MamreRdKempsCreek_R01_Rev1
Reference: Nearmap - www.nearmap.com (Capture Date: 30/05/2025)
NSW Collaboration Portal - https://portal.spatial.nsw.gov.au/client/services?id=f1b1b26b23ab4574a561f890edd3bd7e

3.9 Surface Water

3.9.1 Surface Water Features

Surface water features on the site comprise a number of artificial farm dams constructed within natural topographic depressions. Although these dams are man-made, their placement and drainage behavior follow the underlying natural landform, with overland flow paths and ephemeral channels reflecting the site's original slope patterns.

Two distinct surface water sub catchments occur:

Eastern Sub Catchment (draining north)

- Multiple small dams are positioned across the eastern portion of the site, each located in shallow natural depressions.
- These dams spill along an ephemeral drainage line that follows the natural fall of the land toward the north.
- The drainage line ultimately feeds the large north-eastern dam, which occupies the lowest natural point in the eastern sub catchment.
- Overflow from this system, when it occurs, continues north toward off-site ephemeral drainage features.

Western Sub Catchment (draining south-west)

- Several small artificial dams are distributed across the western part of the site, again situated in natural depressions along the western slope.
- Overland flow and occasional ephemeral drainage follow the south-western natural slope, directing water toward the internal low point at the south-western corner of the property.
- No engineered channels are present; drainage follows the original shape of the land.

All dams are perched and rely on direct rainfall and surface runoff. There are no natural permanent streams onsite, and connectivity between dams likely occurs only during and following rainfall events.

The combined system ultimately contributes to downstream ephemeral drainage lines and, under rare overflow conditions, forms part of the broader South Creek sub catchment within the Hawkesbury–Nepean watershed.

3.9.2 Surface Water Quality Investigations

Surface water quality was assessed through sampling of the three main onsite dams (SW01, SW02 and SW03) on 4 November 2025 (JBS&G, 2025c). Grab samples were collected from accessible points within each dam and analysed by NATA-accredited laboratories for a suite of general water quality parameters, nutrients, metals, major ions, hydrocarbons (TPH/TRH and BTEX) and PAHs. Field measurements of pH, electrical conductivity (EC), dissolved oxygen (DO), temperature and redox potential were also recorded.

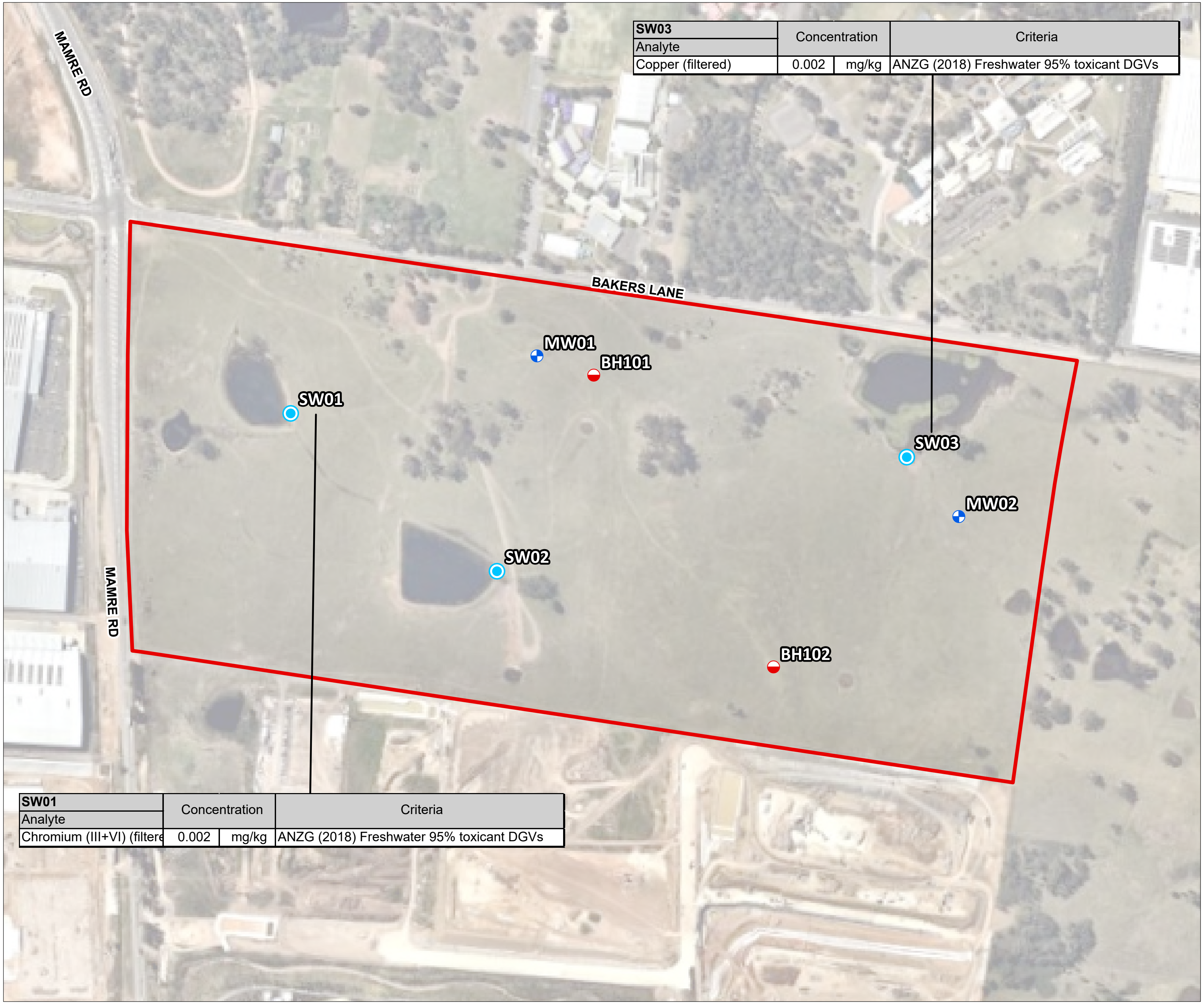
The dams were observed to contain clear to slightly turbid water with no visible sheen or odour. Field pH values were alkaline (pH 7.8 to 9.0), particularly in the eastern sub catchment, which may reflect minor influence from concrete runoff on the adjoining southern property. Electrical conductivity values ranged from fresh to mildly brackish, consistent with runoff from rural land and disturbed soil profiles.

Laboratory results indicated:

- All hydrocarbons (BTEX and TRH), PAHs, reactive phosphorus, fluoride, nitrate and nitrite were below detection limits or adopted guideline values.

- Low-level detections of chromium and copper above ANZG (2018) 95% species protection values occurred in isolated samples, consistent with background metals in the Bringelly Shale and sediment mobilisation from nearby earthworks. The location of these elevated concentrations is presented in **Figure 3.8**.
- Major ion chemistry varied across dams, with sodium-chloride dominated water in SW03 and mixed cation-bicarbonate water in SW01 and SW02 (**Appendix A**).

Overall, surface water quality is consistent with rural-residential catchments affected by minor construction runoff and does not indicate the presence of discrete contaminant sources.



SW03 Analyte	Concentration		Criteria
Copper (filtered)	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

SW01 Analyte	Concentration		Criteria
Chromium (III+VI) (filtere	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

Legend
🟥 Approximate Site Boundary
Sample Locations
● Groundwater
● Surface Water
● Borehole

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: L02 Rev A	Date 17/11/2025
Drawn By: JL/AB	Checked By: JC

Scale 1:6,000

0 50 100
metres

Coord. Sys. GDA 1994 MGA Zone 56

Lot 10 DP1280592,
706-752 Mamre Road
Kemps Creek, NSW

SURFACE WATER QUALITY RESULTS

FIGURE 3.8

File Name: 70548_MamreRdKempsCreek_R01_Rev1
Reference: Nearmap - www.nearmap.com (Capture Date: 30/05/2025)
NSW Collaboration Portal - https://portal.spatial.nsw.gov.au/client/services?id=f1b1b26b23ab4574a561f890edd3bd7e

3.10 Groundwater/Surface Water Interaction

The shallow groundwater system beneath the site occurs within a low permeability weathered shale aquitard (Residual + Units A/B) that exhibits slow groundwater movement, minimal vertical recharge and negligible short-term response to rainfall. Logger data from BH101 and BH102 show extremely stable groundwater levels positioned just above the Unit C aquiclude, confirming the presence of an unproductive fractured-rock aquitard with limited hydraulic connectivity.

The farm dams across the site, although artificial, occupy natural surface depressions and follow the original slope of the terrain, with the eastern sub catchment draining north and the western sub catchment draining south-west. These dams sit significantly above the regional groundwater table; however, localised interaction is possible where standing water overlies zones of increased weathering or shallow bedrock transition.

This is most evident at MW02:

- MW02 is positioned immediately beside a dam.
- The recorded groundwater elevation is elevated relative to other monitoring points.
- The groundwater level correlates closely with dam water level rather than regional groundwater.

This suggests a minor, highly localised hydraulic influence where dam water may migrate into the shallow soil profile or upper weathered shale in the immediate vicinity of the dam embankment. Any such interaction is expected to be:

- Perched;
- shallow;
- limited in spatial extent; and
- not representative of the broader groundwater system.

Across the remainder of the site, there is no evidence of sustained groundwater discharge to dams or surface drainage lines, and no indication of baseflow contributions to ephemeral channels. The rising Unit C aquiclude toward lower elevations limits upward movement of groundwater, while the fractured shale aquitard restricts horizontal movement.

Accordingly, while very local perched interaction may occur adjacent to select dams, the regional groundwater and surface water systems remain largely disconnected, each responding independently to rainfall, overland flow and geology.

4. Hydrogeology - Conceptual Site Model

4.1 Requirements for Conceptual Site Model

A Hydrogeological Conceptual Site Model (CSM) is required to satisfy the Planning Secretary's Environmental Assessment Requirements (SEARs), which call for an assessment of potential groundwater impacts in accordance with the NSW Groundwater Assessment Toolbox for Major Projects (DCCEEW, 2022) and the NSW Aquifer Interference Policy (2012). The purpose of the CSM is to describe the existing hydrogeological environment, illustrate the relationship between groundwater and proposed earthworks, and identify potential impact pathways so that appropriate management and mitigation measures can be developed.

In accordance with the Groundwater Assessment Toolbox, the level of groundwater assessment required must be proportionate to the scale and nature of the proposed activity. The proposed development does not include groundwater ongoing dewatering, depressurisation, installation of permanent drainage infrastructure, or any activity that would induce long-term drawdown or alter regional groundwater conditions. Groundwater will only be encountered locally and temporarily where bulk excavation intersects the shallow unconfined aquitard.

Given the limited extent of groundwater interaction and the absence of long-term groundwater effects, a Level 1 (High-Level) conceptual model is appropriate. Such models consist of:

- A description of the hydrostratigraphy and groundwater system.
- A representation of groundwater levels and flow directions.
- 2D conceptual cross-sections showing excavation relative to the water table.
- Identification of short-term groundwater inflow pathways and potential temporary impacts.

A numerical groundwater model is not required for this project, as the toolbox specifies that numerical modelling is only necessary where groundwater take, drawdown propagation, or long-term changes in groundwater regime are expected. None of these conditions apply to the proposed development.

The CSM presented in this Section therefore provides a qualitative hydrogeological framework, supported by measured groundwater levels, mapped geology, monitoring data and interpreted cross-sections, sufficient to assess the temporary and localised interactions between the proposed earthworks and the shallow groundwater system.

4.2 Proposed Earthworks and Design Constraints

4.2.1 Overview

The proposed development involves extensive bulk earthworks to establish a level building platform for the data centre campus. This includes significant cut and fill across the central ridge, new internal road formation, and service trench installation. No basements or permanent subgrade structures requiring depressurisation are proposed.

The key hydrogeological interaction arises where the Bulk Excavation Level (BEL) intersects the existing groundwater table. In these locations, groundwater will be extracted by excavation, rather than via pumping or depressurisation. Groundwater extraction will occur only during construction, with no long-term groundwater management required once earthworks are complete.

4.2.2 Existing Ground level

The site is defined by a broad ridge trending southeast–northwest, with natural ground elevations ranging from approximately 80 m AHD on the ridge to approximately 55 m AHD in the north-eastern and southwestern low-lying depressions. Artificial farm dams have been constructed along natural drainage depressions in both the eastern and western sub catchments.

Groundwater within the shallow aquitard appears at elevations of approximately 59–68 m AHD, depending on local ridge height and weathered shale thickness. A deeper groundwater system occurs immediately above the Unit C aquiclude, as observed in geotechnical and monitoring logs.

4.2.3 Proposed bulk excavation level

Bulk excavation will locally lower ground surfaces to the BEL shown on the proposed cut and fill plan (**Figure 4.1**). Across most of the site, the BEL remains above the groundwater table. However, in several ridge-adjacent cuts, the BEL intersects:

- The shallow unconfined aquitard (Residual + Unit A/B).
- In isolated high-elevation locations, the upper portion of the deeper shale aquiclude (Unit C).

Where this occurs, groundwater will be physically removed during excavation. Importantly:

- No excavation extends deep enough or wide enough to induce lateral drawdown.
- No long-term subsoil drainage system is proposed.
- Excavation intersects groundwater only temporarily, during construction.

These interactions are illustrated clearly in the conceptual cross-sections.

4.2.4 Cross Sections

Two high-level conceptual hydrogeological cross-sections have been prepared the layout of these cross sections is show in **Figure 4.2**:

Section A–A’ (West–East)

Figure 4.3. Shows the western sub catchment, ridge crest and eastern drainage depression. The BEL intersects the shallow aquitard on the eastern ridge flank and locally clips the upper surface of the Unit C aquiclude.

Section B–B’ (South–North)

Figure 4.4 Crosses southern depression, and the highest portion of the ridge. This section highlights locations where the BEL intersects both groundwater systems including intersection of the shallow groundwater in the weathered shale; and deeper groundwater resting on the Unit C aquiclude.

Both sections demonstrate:

- The water table is topography-controlled.
- Groundwater is shallow relative to ridge flanks.
- Deep shale units rise toward the ridge, constraining groundwater.
- Excavation-induced groundwater extraction is highly localised.

Legend

🟥 Approximate Site Boundary

JBS&G

Job No: 70548

Client: Plan Project Management

Version: R01 Rev 1

Date: 13-Nov-2025

Drawn By: AB

Checked By: JC

Scale: 1:5,000 at A3

0 100 200 300

metres

Coord. System: GDA 1994 MGA Zone 56

Lot 1 DP104958
706-752 Mamre Road
Kemps Creek, NSW

PROPOSED CUT AND FILL PLAN

FIGURE 4.1

File Name: C:\Users\Abiskupovic\JBS&G Australia\DCS - Internal - V2\Projects\Plan Project Management\70548 Mamre Rd Kemps Creek\Proposal\GIS\02_MapProjects\70548_MamreRdKempsCreek_R01_Rev1.aprx
Reference: Nearmap - www.nearmap.com (Capture Date: 20/10/2025)

4.2.5 Cross Sections

Two high-level conceptual hydrogeological cross-sections have been prepared the layout of these cross sections is show in **Figure 4.2**:

Section A–A' (West–East)

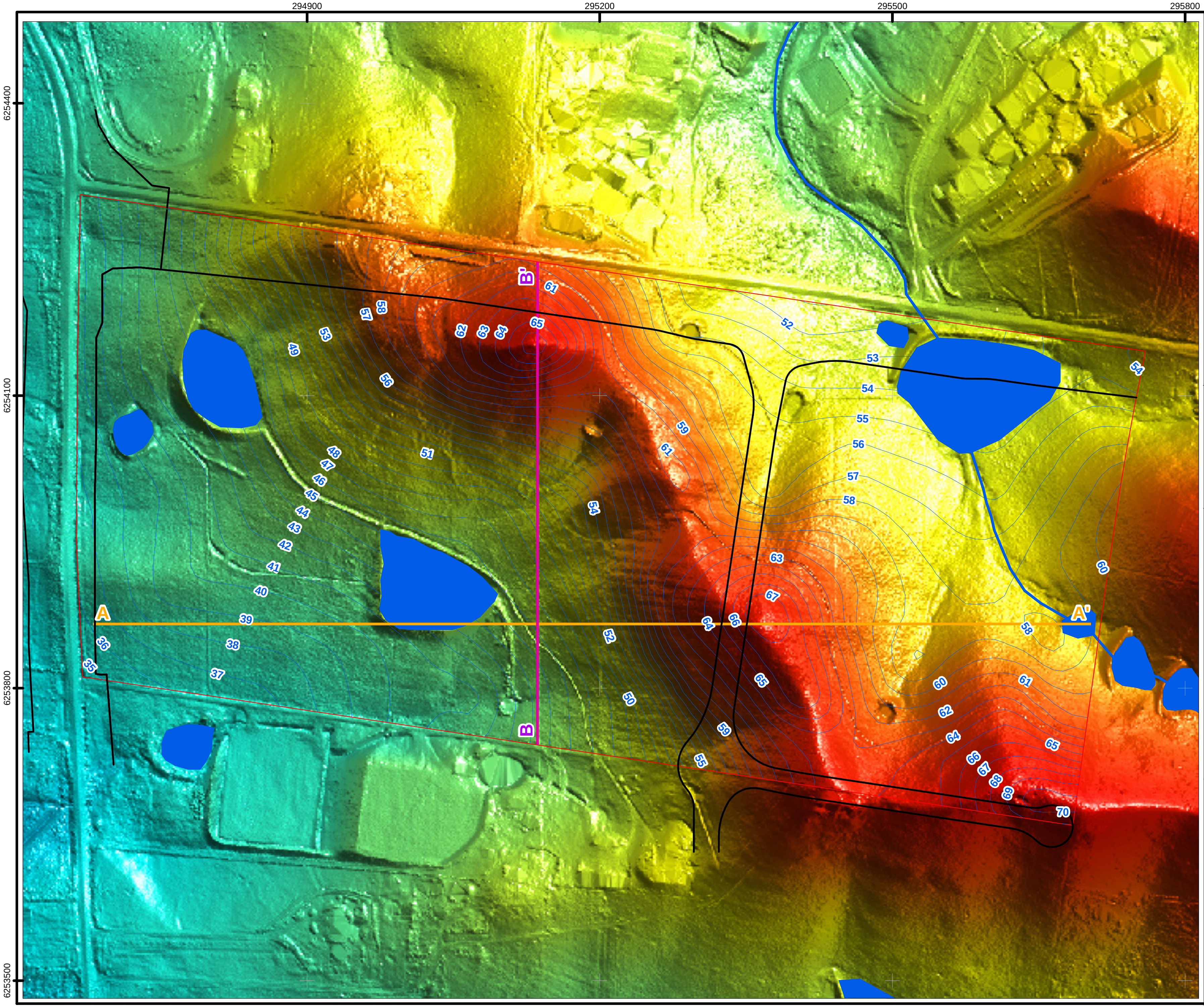
Figure 4.3. Shows the western sub catchment, ridge crest and eastern drainage depression. The BEL intersects the shallow aquitard on the eastern ridge flank and locally clips the upper surface of the Unit C aquiclude.

Section B–B' (South–North)

Figure 4.4 Crosses southern depression, and the highest portion of the ridge. This section highlights locations where the BEL intersects both groundwater systems including intersection of the shallow groundwater in the weathered shale; and deeper groundwater resting on the Unit C aquiclude.

Both sections demonstrate:

- The water table is topography-controlled.
- Groundwater is shallow relative to ridge flanks.
- Deep shale units rise toward the ridge, constraining groundwater.
- Excavation-induced groundwater extraction is highly localised.



Legend:

General:

🟥 Site Boundary

— Proposed Boundary

— Cross-Section A

— Cross-Section B

Hydrology:

— Watercourse

▇ Waterbody

Hydrogeology:

— Interpreted Groundwater Elevation (mAHD)

DEM (2019):

High : 90mAHD

Low : 25mAHD

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: R01RevA	Date: 19-Nov-2025
Drawn By: DAW	Checked By: JC

Scale 1:5,200

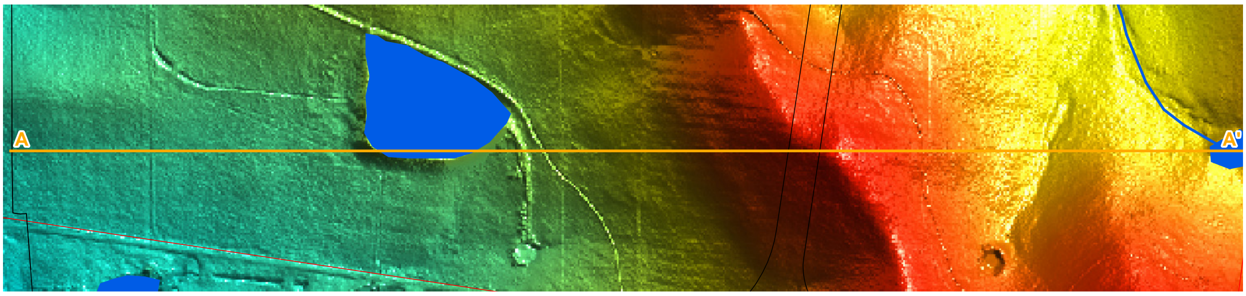
0 100 200
m

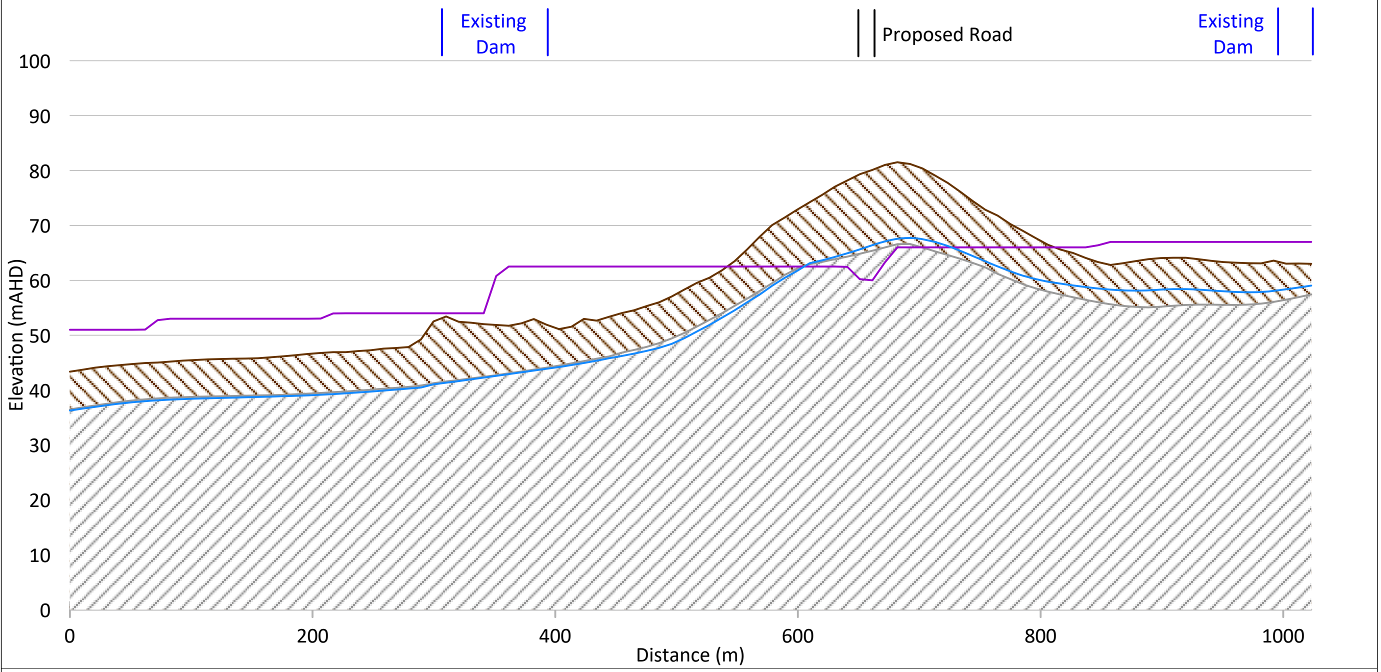
Coor. Sys. GDA2020 MGA Zone 56

Location of Cross-Sections

FIGURE: 4.2

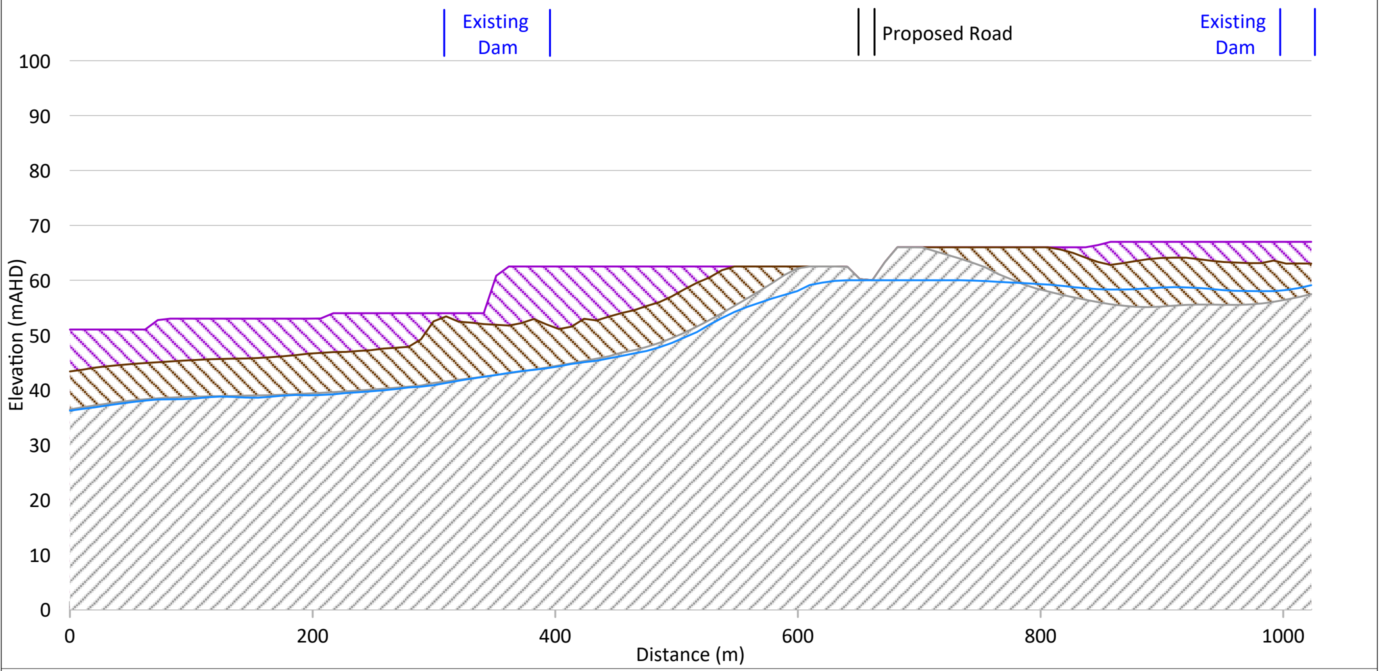
File Name: N:\Company Folder\Proposals\Plan Project Management\70548 Mamre Rd Kemps Creek\Water Quality Interpretive Report\4. Analysis\Modelling\Figures\GIS\Maps\70548_R01RevA_D002_CrossSections.mxd
Reference: Basemaps: NSW DCS Spatial Services (2019). Shapefiles: NSW DCS Spatial Services (2025).





Pre-development:

Horizontal Scale 1:6,230 @A4: 0 100 200 m



Post-development:

Horizontal Scale 1:6,230 @A4: 0 100 200 m

Legend

Hydrogeological Interpretation:

- — Water Table

Hydrogeological Units:

- — Proposed Post-development Ground Surface
- ▨ Proposed Post-developement Fill
- ▨ Weathered Shallow Aquitard
- ▨ Deep Hard Rock Aquiclude

Note: Legend for symbology in aerial Cross-Section provided in Cross-Section layout figure.

Job No.: 70548

Client: Plan Project Management Pty Ltd

Version: R01RevA

Date: 19/11/2025

Drawn By: DAW

Checked By: JC

Conceptual Hydrogeological Model
(Section A - A')

Figure 4.3

JBS&G

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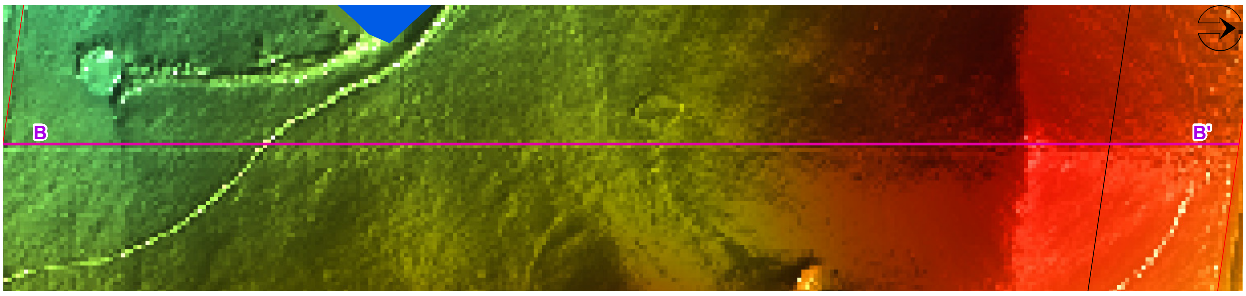
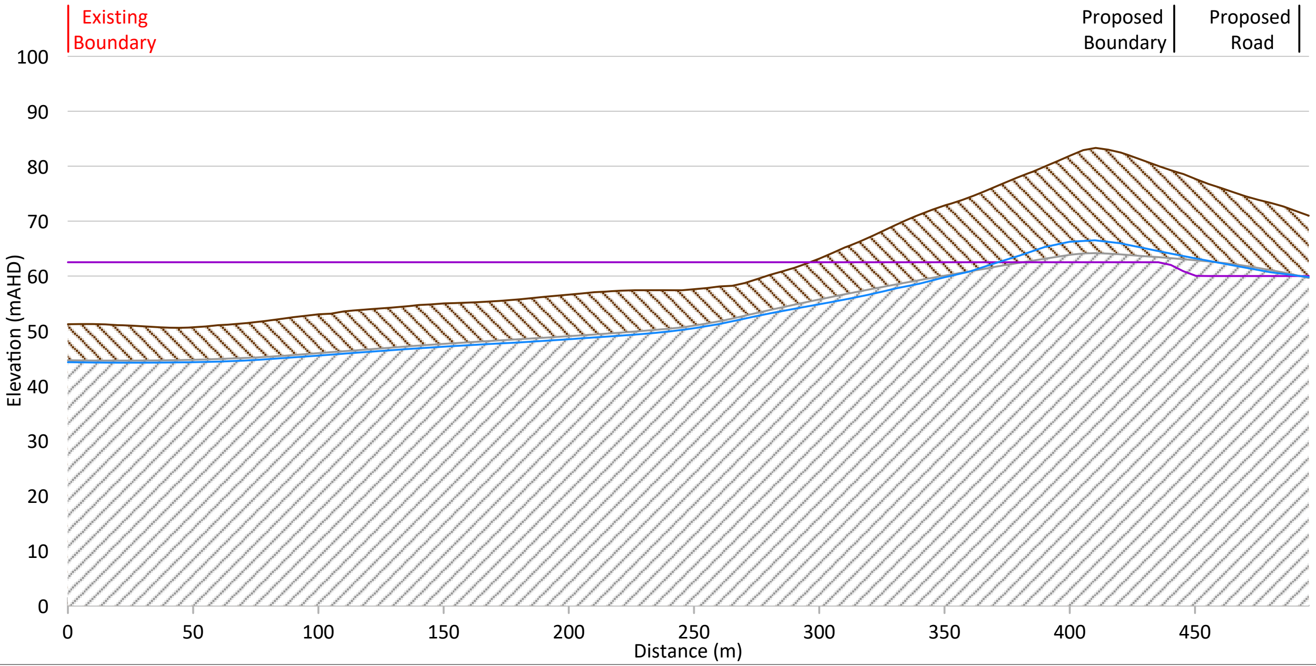
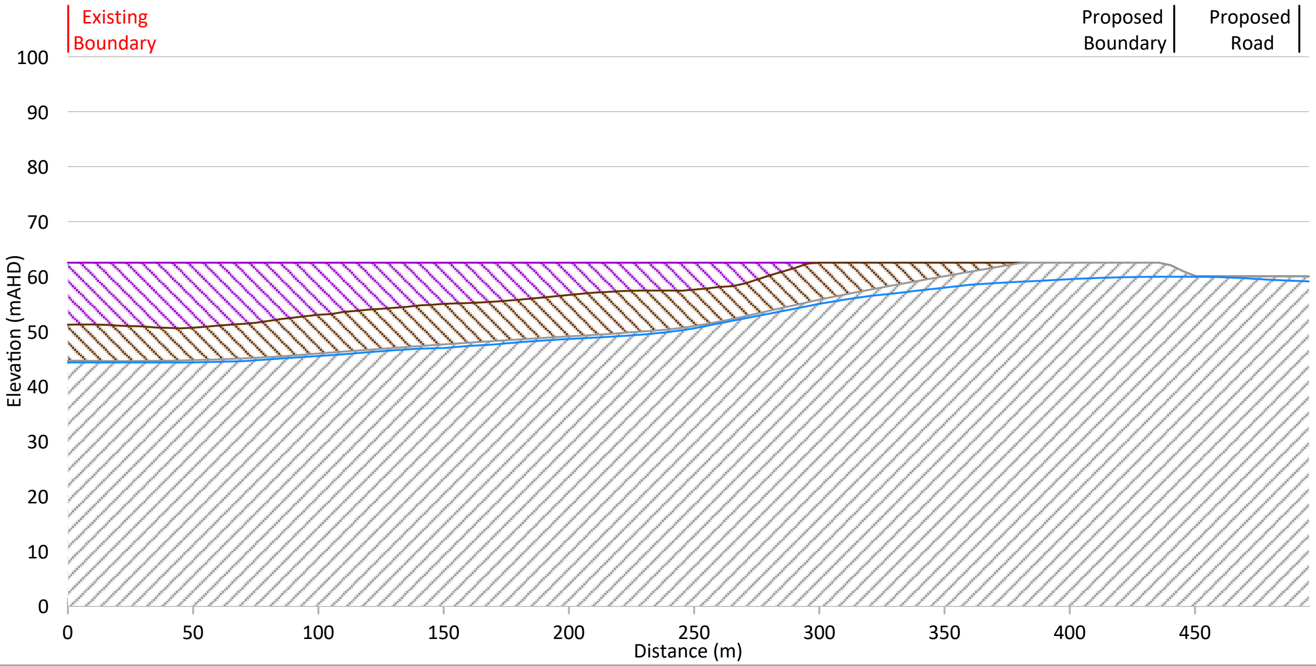
Reference:





Pre-development:

Horizontal Scale 1:3,020 @A4:



Post-development:

Horizontal Scale 1:3,020 @A4:

Legend

Hydrogeological Interpretation:

— Water Table

Hydrogeological Units:

— Proposed Post-development Ground Surface

▨ Proposed Post-developement Fill

▨ Weathered Shallow Aquitard

▨ Deep Hard Rock Aquiclude

Note: Legend for symbology in aerial Cross-Section provided in Cross-Section layout figure.

Job No.: 70548

Client: Plan Project Management Pty Ltd

Version: R01RevA

Date: 19/11/2025

Drawn By: DAW

Checked By: JC

Conceptual Hydrogeological Model
(Section B - B')

Figure 4.4

File Path: N:\Company Folder\Proposals\Plan Project Management\70548 Mamre Rd Kemps Creek\Water Quality Interpretive Report\4. Analysis\Modelling\Figures\Grapher\70548_R01RevA_D001b\70548_R01RevA_D001b_CrossSectionB.grf

Reference:

4.2.6 Drainage strategy

The surface water drainage strategy (AT&L, 2025) directs runoff via a series of interim and future upgraded surface drainage structures. No subsoil drainage, cut-off drains or groundwater control systems are included in the design. The drainage layout generally preserves the two natural surface-water sub catchments:

- Eastern sub catchment draining north, and
- Western sub catchment draining south-west to west.

All surface water systems remain perched above the groundwater table. The development will not create new groundwater discharge zones. The majority of the site is planned as hardstand with water directed to stormwater.

4.3 Model Objectives and Model Class

4.3.1 Model Objectives

The purpose of the Conceptual Site Model (CSM) is to provide a clear and defensible representation of the hydrogeological conditions at the site and to describe how the proposed development interacts with the shallow groundwater system. The CSM is required to satisfy the SEARs and is prepared in accordance with the NSW Groundwater Assessment Toolbox for Major Projects (DCCEEW, 2022) and the NSW Aquifer Interference Policy (2012).

The primary objectives of the model are to:

- Characterise the existing groundwater system, including hydrostratigraphy, groundwater levels, flow directions and hydraulic boundaries.
- Define the relationship between proposed earthworks and groundwater, including locations where the BEL intersects the shallow aquitard and deeper aquiclude.
- Identify zones of groundwater extraction due to excavation and assess the extent and duration of such interactions.
- Determine whether excavation affects off-site groundwater levels, flow pathways or downstream receptors.
- Identify potential impact pathways between excavation activities, shallow groundwater, surface water features, and sensitive environmental receptors.
- Support the design of groundwater management measures that are proportionate to the scale and duration of the interaction.

The CSM provides the hydrogeological basis for the impact assessment presented in **Section 5**.

4.3.2 Model Class

In accordance with the Groundwater Assessment Toolbox (2022), the level of assessment required must be proportionate to the scale, duration and risk profile of the proposed groundwater interaction. The proposed development:

- • does not involve groundwater extraction for ongoing operational use.
- • does not induce long-term or regional groundwater drawdown.
- • only intersects groundwater locally and temporarily during cut and fill activities.
- • does not modify groundwater recharge or discharge pathways.
- • occurs within a low-yield fractured shale aquitard underlain by an aquiclude.

Based on these characteristics, the project meets the criteria for a Level 1 (High-Level) conceptual groundwater assessment, which relies on:

- Qualitative descriptions of hydrostratigraphy.
- Interpreted groundwater surfaces.
- 2D conceptual cross-sections.
- Simple water balance or volumetric reasoning where needed.

A numerical groundwater model is not required because:

- Excavation does not generate measurable drawdown beyond the excavation footprint.
- There is no pumping-induced interference.
- Groundwater behaviour is simple and topography-controlled.
- The extent of groundwater interaction is shallow and highly localised.
- Potential impacts are temporary and occur only during construction.

This model class is consistent with the Toolbox’s guidance for earthworks-only projects involving shallow groundwater intersection without long-term aquifer interference.

4.3.3 Model Limitations

The H-CSM has been prepared using:

- Available geotechnical borehole logs.
- Groundwater monitoring data from MW01, MW02, BH101 and BH102.
- Short-term logger data (two-week hydrographs).
- Topographic survey (DEM).
- Mapped geology.
- Interpreted groundwater elevation contours.

Limitations of the model include:

- Short-duration groundwater monitoring, which limits understanding of seasonal variability.
- Monitoring bores located only along the ridge, resulting in no direct groundwater data from lower drainage depressions.
- Interpretation of groundwater elevation guided partly by geotechnical control points rather than monitoring wells.
- Uncertainty regarding the lateral extent of perched conditions adjacent to surface water dams.
- Groundwater elevations representing a snapshot of conditions, not long-term trends.

Despite these limitations, the dataset is sufficient for a Level 1 conceptual model, and supports a robust assessment of the limited and temporary groundwater interactions associated with the proposed excavation.

4.4 Hydrogeology - Conceptual Site Model Design

The Hydrogeology – Conceptual Site Model (H-CSM) has been designed to provide a simplified but robust representation of groundwater conditions at the site and describes how these conditions interact with the proposed excavation works. The H-CSM integrates geotechnical data, groundwater monitoring, interpreted geology and the proposed Bulk Excavation Level (BEL) to form the basis of the groundwater impact assessment presented in Section 5.

The H-CSM focuses on the configuration and hydraulic behaviour of the shallow unconfined aquitard and the deeper shale aquiclude (Unit C), and defines the relative position of the groundwater table, excavation depths and surface water systems.

4.4.1 Model Geometry and Hydraulic Properties

Based on geotechnical logs, monitoring data and previous investigations, the H-CSM comprises three principal hydrostratigraphic elements:

1. Residual Soil and Weathered Shale (Units A/B) – Shallow Unconfined Aquitard

- Typically 3–15 m thick depending on location along the ridge.
- Composed of residual clays, silty clays and highly weathered shale.
- Contains a shallow unconfined groundwater system.
- Groundwater is topography-controlled, occurs at ~59–68 m AHD, and moves slowly downslope.
- Hydraulic conductivity is low (10^{-7} to 10^{-9} m/s), with minimal recharge and low specific yield (<3%).

This unit forms the main groundwater system interacting with the BEL.

2. Moderately Weathered to Fresh Shale (Unit C) – Aquiclude

- Forms a regionally continuous, very low-permeability layer beneath the aquitard.
- Occurs at shallow depth beneath ridge crests and greater depth in valley floors.
- Exhibits extremely low hydraulic conductivity ($<10^{-10}$ m/s).
- Supports a deeper groundwater level immediately above the Unit C surface.

This unit prevents vertical groundwater movement and defines the base of the active groundwater system.

3. Perched Surface Water Features

- • Artificial dams constructed along natural drainage depressions.
- • Perched well above the groundwater table.
- • Flow directions determined by natural topography (north and south-west).
- • Limited localised hydraulic influence may occur adjacent to some dam margins (e.g. MW02).

These features do not function as groundwater discharge zones.

4.4.2 Digital Elevation Model (DEM)

The DEM shows a broad ridge trending southeast–northwest, with drainage depressions to the north and south-west. The DEM influences both groundwater and surface water behaviour:

- Groundwater mimics ridge geometry and flows outward from the high points.
- Surface water dams follow natural depressions and remain perched.
- Site elevations range from ~55–80 m AHD.

The DEM is used to interpret the potentiometric surface.

4.4.3 Bulk Excavation Level (BEL)

The BEL intersects groundwater where excavation depth cuts into:

- the shallow unconfined aquitard (Units A/B), and
- locally, the upper portion of the Unit C aquiclude in ridge-top cuts.

Where these intersections occur, groundwater is extracted by excavation, not by pumping.

This interaction is:

- temporary (construction-only).
- shallow and localised.
- not deep enough or extensive enough to cause lateral drawdown.
- not expected to alter groundwater levels beyond the excavation footprint.

Post-construction, the groundwater system will re-establish natural conditions.

4.4.4 Design Groundwater Potentiometric Surface

The interpreted groundwater surface (**Figure 4.5**) incorporates:

- measured groundwater levels at MW01, MW02, BH101 and BH102.
- depths to the Unit B–C interface from lower-elevation geotechnical logs.
- DEM-derived slope patterns.
- expected aquitard behaviour.

Key characteristics:

- • Groundwater occurs between ~59–68 m AHD.
- • A groundwater high lies beneath the ridge crest.
- • Flow directions are:
    - north in the eastern sub catchment.
    - south-west in the western sub catchment.
- • Groundwater elevation rises slightly toward lower elevations, consistent with aquitard behaviour and the upward-rising Unit C aquiclude.
- • MW02 reflects local perched influence from an adjacent dam—not regional groundwater.

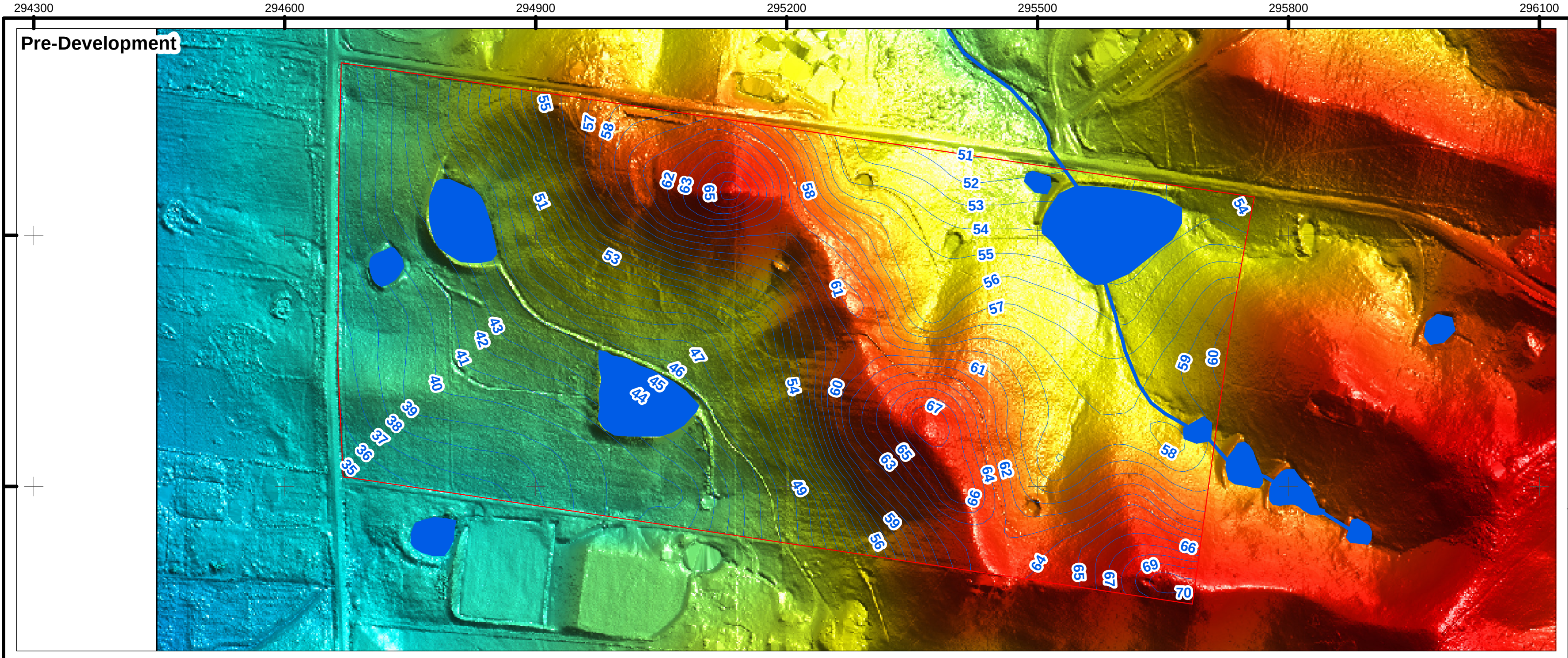
The interpreted potentiometric surface is suitable for Level 1 groundwater assessment and accurately defines where the BEL intersects groundwater.

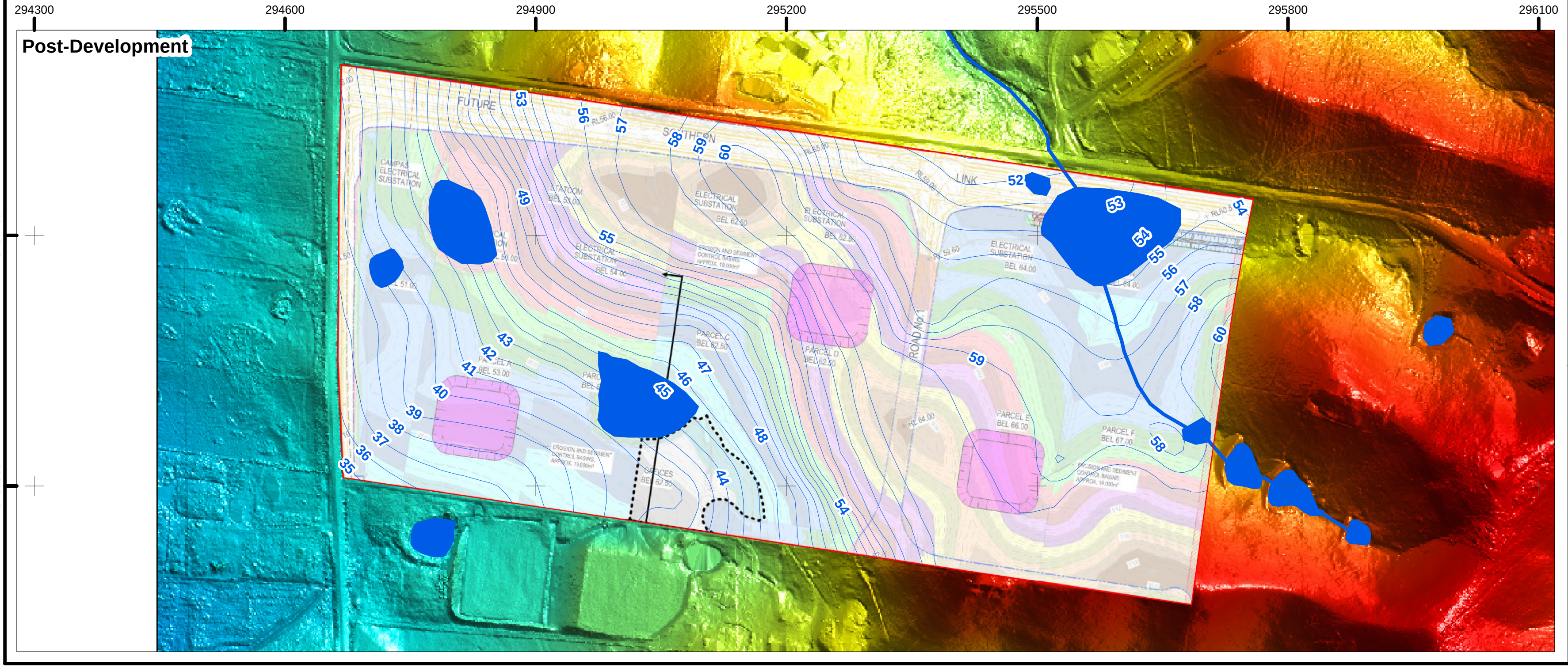
4.4.5 Summary – H-CSM

The Hydrogeology – Conceptual Site Model Design demonstrates that:

1. Groundwater exists in a shallow, topography-controlled aquitard.
2. A continuous shale aquiclude defines the base of groundwater movement.
3. Excavation extracts groundwater only in localised and temporary areas.
4. No long-term drawdown or hydrogeological change is expected.
5. Surface water features remain perched and disconnected.

The BEL interacts with groundwater at isolated points, as shown in cross-sections.





Legend:

General:

▭ Site Boundary

Hydrology:

— Watercourse

■ Waterbody

Hydrogeology:

— Interpreted Groundwater Elevation (mAHD)

DEM (2019):

High : 90mAHD

Low : 25mAHD

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: R01RevA	Date: 19-Nov-2025
Drawn By: DAW	Checked By: JC

Scale 1:8,000

0 100 200
m

Coor. Sys. GDA2020 MGA Zone 56

Interpreted Groundwater Elevations (mAHD):
- Pre-Development
- Post-Development

FIGURE: 4.5

File Name: N:\Company Folder\Proposals\Plan Project Management\70548 Mamre Rd Kemps Creek\Water Quality Interpretive Report\4. Analysis\Modelling\Figures\GIS\Maps\70548_R01RevA_D003_InterpGWE.mxd
Reference: Basemaps: Aerial Imagery taken 14 May 2011, provided by Nearmap. Contours: 2011 1m DEM provided by Spatial Services, a unit of Department Finance, Services and Innovation (DFSI).

4.5 Groundwater Take - Excavation

The NSW Aquifer Interference Policy requires that all water taken as a result of an activity is accounted for, including water removed incidentally during excavation. For this project, groundwater take is limited to one-off extraction of groundwater contained within the volume of weathered shale intercepted by bulk excavation. No ongoing pumping or operational groundwater use is proposed.

4.5.1 Methodology

A conservative volumetric approach has been adopted to estimate groundwater take:

1. Define an envelope of influence representing the maximum volume of weathered shale intersected by excavation where groundwater may be present.
2. Estimate the proportion of that envelope that is saturated, based on the interpreted groundwater surface relative to the BEL.
3. Apply an effective fracture/void volume (specific yield) for the weathered shale aquitard to approximate the volume of mobile groundwater that could be removed.

The envelope is represented as a simple rectangular prism aligned with the ridge-top

4.5.2 Assumptions and Calculations

The following conservative assumptions have been applied (summarised from the calculation sheet):

Rectangular prism dimensions

Length: 5 m

Height: 100 m

Width (depth in plan): 500 m

Geometric volume: 250,000m^3

Saturated proportion of the prism

Proportion of vertical extent saturated: 50 %

Proportion of horizontal/plan extent intersecting the water table: 50 %

Effective saturated rock volume: 625,000m^3

Fracture/void volume of weathered shale (specific yield)

Assumed at 0.1 %, consistent with a low-yield shale aquitard.

Estimated volume of mobile groundwater: 625 m^3

Total estimated excavated groundwater conversion to ML: Approximately <u>0.625 ML</u>

4.5.3 Estimated Groundwater Take

Based on the above assumptions, the total groundwater volume extracted by excavation across the ridge-top cuts is estimated to be:

0.6 ML (0.625 ML)

This estimate is deliberately conservative because:

- The rectangular prism over-represents the actual irregular excavation geometry.
- Saturated proportions (50 % by height and plan) are likely to be higher than actual field conditions in some locations.
- A fracture volume of 0.1 % is at the upper end for low-permeability weathered shale; many parts of the aquitard will yield less water.

The actual groundwater take during construction is therefore expected to be less than 0.625 ML.

4.5.4 Regulatory Context and Significance

The estimated groundwater take:

- occurs once only during construction.
- is small in absolute volume (<1 ML).
- does not involve ongoing pumping or licensed groundwater abstraction.
- is negligible compared with long-term extraction limits specified in the relevant Water Sharing Plans for the Greater Metropolitan Region Groundwater Sources.

Accordingly, the groundwater take associated with excavation is considered minor and of low significance, and does not trigger the need for a quantitative numerical groundwater model or additional licensing beyond standard construction water management requirements.

5. Impact Assessment

5.1 Impact to Site Water Management

The proposed development does not involve active dewatering or any groundwater pumping. Groundwater interaction will occur only where bulk excavation intersects the shallow aquitard and, in isolated ridge-top locations, the upper surface of the deeper aquiclude. In these areas, groundwater will be removed only as part of the excavation process, with no ongoing groundwater management required once earthworks are complete.

The total estimated groundwater volume extracted by excavation is approximately 0.6 ML across the entire construction footprint. This volume is minor, occurs only once during construction and does not require long-term water handling infrastructure.

All groundwater removed will be managed through standard construction water controls already included in the site stormwater and erosion and sediment management strategy (AT&L, 2025a). These controls are designed for significantly larger stormwater volumes than the estimated groundwater take.

Given the small volume and one-off nature of groundwater extraction, the impact of the Project on site water management is considered negligible.

5.2 Impact to Groundwater Environment

The Hydrogeology–Conceptual Site Model (H-CSM) demonstrates that the site contains a shallow unconfined aquitard underlain by a continuous low-permeability aquiclude (Unit C). Groundwater movement is extremely slow, topography-controlled and has very low storage.

Importantly:

- The Project does not involve groundwater pumping.
- Excavation is shallow and limited to ridge-top areas.
- All groundwater take is localised and temporary.
- The aquiclude prevents any deeper or regional drawdown.

Given these conditions, excavation will not alter the groundwater table outside the immediate excavation footprint. Once construction is complete, the groundwater table will equilibrate naturally to post-development conditions.

Accordingly, the Project will not result in any measurable or significant change to groundwater levels regionally, flow directions or aquifer behaviour, and the impact to the groundwater environment is assessed as insignificant.

5.3 Impact to Ecological Receptors

Review of the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources (2023) confirms:

- No high-priority groundwater dependent ecosystems (GDEs) occur near the site.
- The mapped potential GDEs to the north of the site are associated with an ephemeral drainage line located downgradient of the proposed BEL.

Groundwater level interpretation and cross-sections indicate that excavation will not alter groundwater levels beyond the ridge-top excavation areas. No change in groundwater discharge to downgradient waterways or riparian zones is expected.

As a result, the Project will not modify groundwater availability to potential GDEs. Accordingly, the impact to ecological receptors is considered negligible.

5.4 Impact to Groundwater Users

No registered groundwater users occur within or immediately adjacent to the site. The nearest potential groundwater user is well outside the zone of influence defined by the shallow aquitard and the low-permeability shale aquiclude.

Because:

- No pumping occurs.
- Excavation produces no measurable drawdown.
- Groundwater levels remain controlled by topography and the Unit C aquiclude.
- There will be no impact on existing groundwater users.

In accordance with the NSW Aquifer Interference Policy (AIP), the Project easily satisfies the Level 1 minimal impact criteria:

- <2 m cumulative drawdown at any water supply work – satisfied (predicted = 0 m).
- No change in beneficial use category – satisfied.
- No impact within 40 m of high priority GDEs – satisfied.

The Project will therefore have no impact on groundwater users and is fully compliant with the AIP.

5.5 Impact to Surface Water

The Project does not involve:

- Diversion, extraction or modification of natural watercourses (Strahler Order 3)/
- Permanent drainage of surface water features
- Changes to catchment boundaries; or
- Hydrological modifications that affect baseflow.

All three surface water dams are artificial farm storages perched above the groundwater table. Groundwater does not contribute to surface water flow at the site.

During excavation, groundwater removed (~0.6 ML) may be temporarily stored and discharged in accordance with construction water management controls. These volumes are minor relative to stormwater runoff and will not alter catchment hydrology.

Accordingly, the Project has no significant impact on surface water hydrology.

5.6 Impact to Groundwater/Surface Water Interaction

The H-CSM confirms that:

- Groundwater occurs only within a shallow, low-yield aquitard.
- The aquiclude prevents downward leakage.
- The farm dams are likely perched and not groundwater-fed.
- The groundwater level in MW02 exhibits minor localised perched influence but does not represent regional interaction.

Because the Project does not modify groundwater levels beyond the excavation footprint and does not affect drainage depressions, baseflow to downstream waterways will remain unchanged.

Therefore, no significant change in groundwater–surface water interaction is expected.

5.7 Compliance Assessment

5.7.1 Commonwealth Legislation

Environment Protection and Biodiversity Conservation Act 1999

Review of the Commonwealth Protected Matters database confirms that no Matters of National Environmental Significance (MNES) occur within or adjacent to the site that could be impacted by the proposed development.

The Project does not involve long term groundwater extraction, wetland modification, or impacts to listed ecological communities.

The Project is compliant with the EPBC Act.

5.7.2 Commonwealth Guidelines and Policy

Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2018

Surface water and groundwater analytical results were assessed against ANZG (2018) freshwater aquatic ecosystem 95% protection criteria. All exceedances were consistent with natural background levels from the Bringelly Shale and do not represent contaminants introduced by the Project.

There is no predicted impact to surface water or groundwater quality, and the Project will not cause changes that exceed ANZG (2018) thresholds.

The Project is compliant with ANZG (2018).

Australian Drinking Water Guidelines 2011

Groundwater beneath the site is unsuitable for potable use due to natural salinity and is not used for drinking water. Surface water dams are perched, artificial and not potable supply sources. The Project will not introduce contaminants or change water quality in ways that affect any potential future drinking water use in the region.

The Project is compliant with the ADWG.

5.7.3 NSW Legislation

Environmental Planning and Assessment Act 1979

The Project does not involve direct discharge to natural waterways and does not alter water quality beyond existing conditions. All groundwater removed (~0.6 ML) will be managed through standard construction water controls, with no off-site discharge of untreated water. The Project will therefore have a neutral or beneficial effect on water quality, satisfying the SEPP requirements.

Water Management Act 2000

The Project does not involve:

- active groundwater extraction;
- pumping;
- construction of groundwater works; or
- long-term aquifer interference;

The only water removed is the small volume of groundwater intersected by excavation (approximately 0.6 ML), which occurs once during construction and does not require a Water Access Licence.

There is no direct or indirect take from surface water sources, and the development does not modify natural flow paths.

Protection of the Environment Operations Act 1997

The Project uses existing and proposed erosion and sediment control infrastructure and does not require an Environment Protection Licence (EPL) for groundwater extraction or discharge.

All construction water will be managed in accordance with the Construction Environmental Management Plan, and no exceedances of water quality parameters are expected.

Biodiversity Conservation Act 2016

There are no high-priority groundwater dependent ecosystems (GDEs) in the relevant Water Sharing Plan schedule.

Potential GDEs mapped to the north of the site are downgradient and will not be impacted by excavation or temporary groundwater extraction.

The Project does not alter groundwater levels near ecological receptors.

5.7.4 NSW Guidelines and Policy

NSW Water Quality and River Flow Objectives 2006

Table 5.1 presents an assessment of the Project against NSW Water Quality Objectives. It is noted that only applicable objectives are discussed in **Table 5.2**.

Table 5.1: Assessment against NSW Water Quality Objectives

Objective	Compliant	Response
Aquatic ecosystems	Yes	No change to groundwater or surface water quality. No discharge to natural streams.
Visual amenity	Yes	Construction water managed through existing ESC.
Drinking water	Yes	No impact on drinking water sources.
Irrigation & recreation	Yes	No impact to downstream water quality.
Industrial water supply	Yes	No effect on water quality available to industry.

Table 5.2: Assessment Against River Flow Objectives

Objective	Compliant	Response
Protect natural pools in dry times	Yes	No extraction from natural waterways.
Protect natural low flows	Yes	No change to groundwater–surface water interactions.
Maintain wetland & floodplain inundation	Yes	No hydrological modification.
Maintain natural flow variability	Yes	No impact on drainage lines.
Minimise effects of structures	Yes	No new hydraulic structures proposed.
Maintain groundwater for ecosystems	Yes	No impact to mapped or potential GDEs.

5.7.5 Managing Urban Stormwater 2004 and 2008

The Project’s erosion and sediment control strategy is compliant with the Blue Book and relies on standard, widely accepted practices. Groundwater take is too small to influence surface flows.

5.7.6 Guidelines on Controlled Activities on Waterfront Land 2012

There are no waterfront land areas (as defined by the Water Management Act) within or adjacent to the site.

The Project does not involve works within 40 m of natural waterways.

5.7.7 Maximum Harvestable Right Dam Capacity 2006

No new dams or increases to existing dam capacity are proposed. Existing dams remain perched and unchanged.

5.8 NSW Aquifer Interference Policy 2012

Table 5.3 presents an assessment of aquifer interference due to the Project.

Table 5.3: Assessment against NSW Aquifer Interference Policy 20122

Minimal Impact Consideration	Compliant	Response
Water table change <10% at high-priority GDEs	Yes	No high-priority GDEs near the site.
Drawdown <2 m at water supply works	Yes	Predicted drawdown = 0 m (no pumping).

6. Licensing, Management, Monitoring and Mitigation

6.1 Licensing

The NSW Water Management Act 2000 and NSW Aquifer Interference Policy (AIP, 2012) require that any water taken from groundwater or surface water sources be accounted for. For this Project, the only groundwater taken is removed incidentally through excavation, and is estimated at approximately 0.6 ML in total. No groundwater pumping or depressurisation occurs.

Because the take is:

- one-off;
- minor in volume;
- associated only with construction; and
- not part of an ongoing consumptive use;
- it does not trigger the requirement for a Water Access Licence (WAL).

6.1.1 Surface Water

The Project does not:

- intercept natural watercourses;
- modify drainage lines;
- alter low-flow contribution; or
- reduce groundwater discharge to surface waters.

All dams on site are artificial perched farm dams, not connected to the groundwater system. No baseflow contribution is affected, and therefore:

There is no licensable surface water take.

6.1.2 Groundwater

Excavation intersects groundwater only in localised ridge-top areas within the shallow aquitard. The deeper aquiclude prevents vertical propagation of effects.

The estimated take of 0.6 ML total:

- is not ongoing;
- does not exceed thresholds for WAL requirements;
- does not represent consumptive use;
- is consistent with a Level 1 low-risk activity under the NSW Groundwater Assessment Toolbox.

Therefore:

A Water Access Licence is not required, and the Project is compliant with the Water Management Act 2000 and the NSW AIP.

6.2 Management

6.2.1 General Advice

The following management framework ensures impacts remain negligible and compliant with relevant policies.

6.2.2 General Groundwater and Surface Water Management

- Groundwater removed during excavation will be captured and managed through the site's erosion and sediment control system (AT&L, 2025).
- Excavations will be managed to minimise unnecessary ingress of perched surface water.
- Stockpiles and construction areas will be graded to prevent run-on entering open excavations.

6.2.3 Regulatory Compliance

As no groundwater pumping occurs, no additional regulatory approvals are required beyond the Project's development consent conditions.

All construction water discharges (if required) will comply with the Construction Environmental Management Plan.

6.3 Monitoring

6.3.1 Groundwater Level

Groundwater levels will be monitored via:

- Existing loggers in BH101 and BH102.
- Manual dips at each download event.
- Manual dips at MW01 and MW02 as part of construction-phase inspections.

Monitoring frequency:

- Continuation of groundwater level monitoring, including manual and regular logger downloads once per quarter up until the end of the construction phase. Noting that some sites may need to be moved for continuous monitoring during construction. Monitoring should then continue at the same interval through the operations phase for 12 months.

6.3.2 Groundwater Quality

Groundwater chemistry will be monitored to confirm no changes attributable to excavation.

Analytical Suite – Quarterly for one year (to understand seasonal variation)

- Field: pH, EC, DO, Temperature, Eh.
- Lab physicochemical: pH, TDS.
- Major ions: Na, K, Ca, Mg, Cl, SO_4, alkalinity.
- Metals: Al, As, Ba, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Se.
- Nutrients: N, P.
- TPH, BTEX, TRH.
- PAHs.
- Fe, Mn, Zn.

Subsequent Rounds (Routine through to 12 months into operations phase.)

- Field parameters.
- TDS.
- Major ions.
- Fe, Mn, Zn.
- Nutrients, (N, and P).

Monitoring Frequency:

- Bi-annual groundwater and surface water quality monitoring should continue and coincide with the water level monitoring for 12 months into the operations phase.

6.3.3 Surface Water Quality

Surface water dams will continue to be monitored in accordance with the Soil and Water Management Plan.

Sampling will include:

- pH, EC, DO, TDS.
- Major ions.
- Metals.
- Nutrients.
- TSS and hydrocarbons where relevant.

Monitoring Frequency:

- Bi-annual groundwater and surface water quality monitoring should continue and coincide with the water level monitoring, and groundwater quality monitoring for 12 months into the operations phase.

6.4 Mitigation

Given the very low-risk nature of groundwater interaction, few mitigation measures are expected to be required. However, in the unlikely event that groundwater levels or quality deviate significantly from baseline, the following measures may be implemented:

- Initiate a groundwater assessment to account for change in expected ground conditions and review risks and mitigation measures. In line with the assessment initiate the creation of a Trigger Action Response Plan (TARP).
- Modify excavation staging to reduce groundwater exposure.
- Reduce excavation depth in isolated areas.
- Implement temporary bunding to divert run-on away from excavations.
- Install temporary seals/liners where required to limit inflow from perched zones.

7. Conclusions and Recommendations

An impact assessment of the Project has been undertaken in accordance with the NSW Groundwater Assessment Toolbox (2022) and the NSW Aquifer Interference Policy (2012). The assessment was supported by a high-level Hydrogeology–Conceptual Site Model (H-CSM) incorporating groundwater level monitoring, geological data and interpreted groundwater elevations.

Analysis indicates that the Project will result in insignificant impact to the groundwater environment. Groundwater will only be removed where the Bulk Excavation Level intersects the shallow aquitard or, in isolated areas, the upper surface of the aquiclude. This results in a one-off groundwater take of approximately 0.6 ML, with no pumping, no long-term dewatering and no measurable drawdown beyond the excavation footprint. The hydrogeological setting, characterised by a low-yield aquitard underlain by a continuous aquiclude, limits the potential for any regional impact.

The Project will also have no significant impact on surface water or groundwater/surface water interaction. The on-site dams are perched and are likely to have a minor connection to the groundwater system. No natural watercourses occur within the site, and groundwater discharge to downstream drainage lines will remain unchanged.

There are no high-priority groundwater dependent ecosystems or groundwater users in proximity to the site that could be affected. The Project is compliant with all relevant Commonwealth and NSW legislation and guidelines.

Recommendations:

- Continuation of groundwater level monitoring, including manual and regular logger downloads once per quarter up until the end of the construction phase. Noting that some sites may need to be moved for continuous monitoring during construction. Monitoring should then continue at the same interval through the operations phase for 12 months.
- Quarterly groundwater and surface water quality monitoring should continue at the same frequency as the water level monitoring for the next 12 months. Sampling can then be moved to biannually for the remainder of the pre-construction and construction phase. Monitoring should then continue at the same interval through the operations phase for 12 months.

These measures are considered adequate to verify that impacts remain negligible and consistent with the assessment presented in this report.

Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental impact assessment, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown issues, JBS&G reserves the right to review the report in the context of the additional information.

This report, and environmental modelling associated therein, has been prepared to the standard typical of that undertaken by consultants in preparing an environmental impact assessment.

8. References

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Appendix A JBS&G, 2025b – Surface Water and Groundwater Sampling Event – 706-752 Mamre Rd, Kemps Creek, NSW

JBS&G 70548 | 171,949 (Rev A)

L02 (Surface Water and Groundwater Sampling Kemps Creek, NSW) Rev A

17 November 2025

Adam Pavlovic
Plan Project Management
Via email: adam@planpm.com.au

Surface Water and Groundwater Sampling Event - 706-752 Mamre Rd, Kemps Creek, NSW

Dear Adam,

1. Introduction and Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Plan Project Management (the client) to provide environmental consulting services relating to Planning Secretary's environmental assessment requirements (SEARs) provided under Application SSD-92743706 – Mamre Road Data Campus Centre proposed for development at 706-752 Mamre Road, Kemps Creek, NSW (the site). The site covers an area of approximately 55 hectares (ha) and is legally identified as Lot 10 Deposited Plan (DP) 1280592. The site location is shown on **Figure 1** in **Attachment B**.

JBS&G were engaged to prepare a Water Quality Interpretive Report to address a SEAR on the understanding there would be general site water quality data available in geotechnical and stormwater reports being prepared for the site, however, review of the available information indicated that no general water quality data was available for the site. Therefore, JBS&G proposed to undertake groundwater sampling from four existing groundwater monitoring wells and surface water sampling from the three main surface water dams at the site and laboratory analysis of water samples to assist in preparation of the Water Quality Interpretive Report.

This letter details the results of sampling and analysis sampling of groundwater from four monitoring wells and surface water from three surface water dams on the site on 4 November 2025.

1.1 Objective

The objective of the groundwater sampling and surface water sampling was to obtain general water quality data across the site to assist in the preparation of the water quality interpretive report to satisfy SEARs.

1.2 Scope of Work

The scope of work included:

- Sampling of groundwater from four existing wells, including measurement of depth to groundwater, recording field measured parameters, and collection of water samples for laboratory analysis;
- Sampling of surface water from the three surface water dams on site including recording field measured parameters, and collection of water samples for laboratory analysis;
- Laboratory analysis of groundwater and surface water samples for a range of general water quality analytes, including major cations and anions, and potential contaminants;
- Assessment of quality assurance / quality control (QA/QC) of the environmental data; and
- Preparation of a factual letter report documenting the sampling methodology, results and assessment of data against relevant water quality criteria.

2. Water Investigation Methodology

The location of monitoring wells and surface water dams sampled are presented in **Figure 2.**

2.1 Groundwater Sampling

Groundwater monitoring wells MW01, MW02, BH101 and BH102 as shown on **Figure 2** were sampled on 4 November 2025. Sampling of the groundwater monitoring wells was conducted using the following procedure:

- The depth to standing water was gauged and an assessment of the presence/absence of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) was made using an oil/water interface probe.
- Wells were purged and sampled using a bladder pump and low-flow methodology. Purging was undertaken to ensure the samples collected was representative of groundwater being sampled. Field parameters of pH, electrical conductivity (EC), redox potential (Eh), dissolved oxygen (DO) and temperature were measured using field probes contained in a flow cell, and samples were obtained once the parameters stabilised such that:
    - Consecutive temperature readings were within 0.2 ˚C;
    - Consecutive EC readings were within 3 %;
    - Consecutive Eh readings were within 10 mV;
    - Consecutive DO readings were within 10 %; and
    - Consecutive pH readings were within 0.05.
- Collected groundwater samples were immediately transferred to laboratory supplied pre-preserved sample bottles. The sample containers were then transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples for analysis at NATA accredited laboratories including

Eurofins Environment Testing (primary laboratory) and Australian Laboratory Services (secondary laboratory).

- A record of water level gauging data, sample observations (including colour, odour, turbidity and presence of LNAPL, sheens) and sampling method details were recorded on field data sheets (**Attachment E**).

Non-disposable groundwater monitoring equipment, namely an oil/water interface probe, was decontaminated by rinsing with a water/PFAS free detergent (Liquinox) mix, followed by rinsing with potable water.

2.2 Surface Water Sampling

Three surface water samples (SW01, SW02 and SW03) were collected as a grab sample via an extendable sampling arm, or from accessible parts of the dam by hand. Samples were collected in laboratory supplied containers, suitable for the analysis type specified. Samples were collected by submerging the container with the opening facing downwards to a depth of at least 300 mm below the surface. For shallow water, the container was submerged to the mid-point of the water depth, so as not to disturb sediments. Once fully submerged, the container was inverted to fill with water before being retrieved and the lid placed on the opening.

Where laboratory supplied sample containers contain preservatives, the sample was collected in an unpreserved bottle of the same material as the preserved container. The sample was then decanted into the preserved container, leaving no headspace. Similarly the same bottle type was used to collect samples that required field filtering with 45 µm pore filter prior to collection in bottles..

Field parameters of pH, EC, Eh, DO and temperature were measured using field probes and recorded once the parameters stabilised.

The sample containers were then transferred to a chilled cooler for sample preservation prior to and during shipment to the testing laboratory. A COC form was completed and forwarded with the samples.

2.3 Duplicate Sample Preparation

At selected sample locations, sufficient water was collected to provide a primary, blind (intra-lab) duplicate and split (inter-lab) duplicate samples for laboratory analysis. The collected samples were divided laterally/equally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and sampling bottles, as appropriate. Each sample was labelled with primary, duplicate or triplicate sample identification before being placed in the same chilled esky for transport to the laboratory.

2.4 Analytical Schedule

JBS&G subcontracted Eurofins Environment Testing (Eurofins) as the primary laboratory, with Australian Laboratory Services (ALS) as the secondary laboratory. Both laboratories are National Association of Testing Authorities (NATA) registered for the required analyses.

The sample analyses are summarised in **Table 2.1**. In addition to the primary analyses, field duplicate and triplicate samples were analysed at a rate of one per 20 primary samples. A rinsate sample was obtained from non-disposable sampling equipment. A single trip spike and single trip blank accompanied the primary sample batch.

Table 2.1 – Analytical Schedule

Media	Number of Sampling Locations	Analyses (exc. QA/QC)
Groundwater	4 locations	Heavy metals (Al, As, Ba, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Se, Fe, Mn, Zn) – 4 samples Polycyclic aromatic hydrocarbons (PAHs) – 4 samples Total petroleum hydrocarbons/total recoverable hydrocarbons (TPH/TRH) - – 4 samples Benzene, toluene, ethylbenzene, xylene (BTEX) – 4 samples Laboratory measured physiochemical parameters including pH, total dissolved solids (TDS) – 4 samples Major cations and anions (sodium, potassium, calcium, magnesium, chloride, sulfate, alkalinity (speciated)) – 4 samples Fluoride – 4 samples Nutrients (nitrate, nitrite, ammonia) – 4 samples
Surface Water	3 locations	Heavy metals (Al, As, Ba, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Se, Fe, Mn, Zn) – 3 samples PAHs – 4 samples TPHs and TRHs - – 3 samples BTEX – 3 samples pH and TDS – 3 samples Major cations and anions (sodium, potassium, calcium, magnesium, chloride, sulfate, alkalinity (speciated)) – 3 samples Fluoride – 3 samples Nutrients (nitrate, nitrite, ammonia) – 3 samples TSS – 3 samples Oil and grease - 3 samples

3. Assessment Criteria

Groundwater and surface water analytical data were compared against the 95 % protection of freshwater aquatic ecosystems from the Australian and New Zealand Guidelines for Marine and Fresh Water Quality – ANZG (2018).

It is noted that the ammonia criteria provided in ANZG (2018) and summarised in **Table A** (**Attachment D**) has been corrected based on the water pH in accordance with Table 8.3.7 in ANZECC & ARMCANZ (2000)[4].

The adopted assessment criteria are provided in **Table A**, **Attachment D**, together with the summarised results of analysis.

4. Quality Assurance/Quality Control

The results of the laboratories QA/QC analyses have been assessed and were considered of acceptable quality for the purpose of the assessment, QA/QC results and discussion are presented in **Attachment G.**

5. Results of Water Sampling

The monitoring well and surface water sampling locations are shown on **Figure 2**. Groundwater sampling field data sheets are provided in **Attachment E**. Detailed laboratory reports and chain of custody documentation are provided in **Attachment G**. Water analytical data for the sampled wells and surface water is summarised in **Table A, Attachment D**.

5.1 Groundwater Field Observations and Field Measured Parameters

The depth to groundwater in the sampled wells on 4 October 2025 was between 1.961 m below top of casing (m btoc) (MW02) and 15.306 m btoc (BH101). MW01 had a flush mount gatic finish, with the remaining three wells finished with casing stick up and completed with monuments. With the exception of BH102 that did not have a well cap present, all wells were observed to be in good condition.

Groundwater within BH102 was observed to be light grey/black in colour, very turbid, no sheen and a strong hydrogen sulfide odour was noted. It is also noted that organic material (suspected cow hair) was visually observed within the well at this location. Groundwater in the remaining wells was observed to be colourless or light grey in colour, generally clear to slightly turbid, no odour and no sheen. Stabilised groundwater parameters and depths measured in the field prior to the collection of groundwater samples were recorded on field data sheets provided in **Attachment E** with final stabilised results summarised in **Table 5.1** below.

Sample ID	DO (mg/L)	Conductivity (µS/cm)	pH	Redox (mV)	Temperature (°C)
MW01	2.75	4541	6.72	165.7	19.0
MW02	2.59	22838	6.80	111.8	18.8
BH101	1.14	9594	6.80	164.2	19.3
BH102	0.55	2853	6.88	-150.0	19.0

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[4] Australian and New Zealand Environment and Conservation Council (ANZECC) & Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ), 2000

Groundwater was noted to be mildly acidic to close to neutral pH, with low dissolved oxygen indicating groundwater was under reducing conditions. The EC values correlate with brackish to moderately saline waters as expected within the shale bedrock and the hydrogeological setting of the site.

5.2 Surface Water Field Observations and Field Measured Parameters

During the collection of surface waters, field parameters were obtained using a calibrated water quality meter via grab samples and/or measured directly in the water body. Calibration records are provided in **Attachment F**. A summary of reported field measurements following stabilisation of field parameters is provided in **Table 5.2** below.

Table 5.2 Surface Water Parameters

Sample ID	DO (mg/L)	Conductivity (µS/cm)	pH	Redox (mV)	Temperature (°C)
SW01	7.85	234.3	9.02	47.9	22.0
SW02	7.18	140.9	8.11	74.6	22.8
SW03	8.15	1198	7.87	31.6	23.5

Surface waters were generally observed to be clear (colourless) to slightly turbid (brown). No odour or sheen was observed at any of the locations sampled. Based on the field parameters surface waters were fresh and alkaline. Elevated pH readings taken in the field at SW01 and SW02 locations indicate the water may be impacted by surface water runoff from concrete from the adjoining property to the south. It is noted retention ponds were observed to contain peripheral flora and aquatic species of plants, including algae.

5.3 Groundwater Analytical Results

5.3.1 Laboratory Measured Physiochemical Parameters

The laboratory reported water pH between 7.1 (MW02) and 7.5 (BH101), generally consistent with field observations (**Section 5.1**). TDS were reported between 1,700 mg/L (MW102) and 13,000 mg/L (MW02), consistent within the typical range reported for the regional geological unit (i.e. shale of the Wianamatta Group) in Western Sydney, which are reported to be between 5,000 to 50,000 mg/L (BAP 2018[5]).

5.3.2 Heavy Metals

With the following exceptions, heavy metal concentrations were below the adopted ecological criteria for 95 % species protection (ANZG 2018) (**Table A, Attachment D)**:

- 0.018 mg/L nickel and 0.02 mg/L zinc in BH101;
- 0.016 mg/L nickel and 0.13 mg/L aluminium in BH102;
- 0.11 mg/L nickel, 0.004 mg/L copper and 0.019 mg/L zinc in MW01; and
- 0.046 mg/L nickel, 0.002 mg/L copper and 0.11 mg/L zinc in MW01.

Heavy metals within groundwater in concentrations exceeding the adopted ecological criteria are considered reflective of the underlying geology (Bringelly Shale) and the surrounding urban/agricultural environmental setting.

5.3.3 PAHs

All concentrations of PAHs were reported below the laboratory LOR for all samples submitted for analysis.

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[5] *Bioregional Assessment Program* https://www.bioregionalassessments.gov.au/assessments/11-context-statement-sydney-basin-bioregion/1141-groundwater-systems accessed 11 November 2025

5.3.4 TRH/BTEX

All concentrations of TRH/BTEX were reported below or equal to the laboratory LOR for all samples submitted for analysis.

5.3.5 Ammonia

Concentrations of ammonia were reported below the adopted site criteria at all sample locations, noting that the criteria provided in ANZG (2018) with respect to ammonia was corrected based on the water pH in accordance with Table 8.3.7 in ANZECC & ARMCANZ (2000).

5.3.6 Phosphorous Reactive

Concentrations of reactive phosphorous were reported below the laboratory LOR for all samples submitted for analysis.

5.3.7 Fluoride

Concentrations of fluoride were reported below the laboratory LOR for all samples submitted for analysis.

5.3.8 Nitrate and Nitrite

Concentrations of nitrate and nitrite were reported below the adopted site criteria for all samples submitted for analysis.

It is noted in the ANZG (2018) guidelines for nitrate that the trigger value is dependent on the water hardness, as such, the most conservative default guideline value of 1.1 mg/L for water hardness of <30 mg/L $CaCO_3$ has been used for assessment in this investigation.

5.3.9 Major Cations and Anions

Concentrations of major anions and cations are presented in **Table A, Attachment D**.

A Piper plot of major cation and anion data for groundwater samples is provided in **Attachment I**, which indicates that the major ion composition of groundwater is sodium-chloride dominated.

5.4 Surface Water Analytical Results

5.4.1 Laboratory Measured Physiochemical Parameters

The laboratory reported water pH was between 7.6 (QC20251104_01(duplicate of SW03)) and 8.8 (SW01), which was generally consistent with field observations (**Section 5.2**). TSS were reported between 8.2 mg/L (SW03) and 44 mg/L (SW01), consistent with turbidity levels observed during the investigation.

TDS were reported between 86 mg/L (SW01) and 550 mg/L (SW03 and QC20251104_01(duplicate of SW03)).

5.4.2 Heavy Metals

Review of results of analysis indicated that with the following exceptions heavy metal concentrations were below the 95 % species protection (ANZG 2018) criteria:

- 0.002 mg/L chromium (III+VI) in SW01 exceeding the criterion of 0.001 mg/L; and
- 0.002 mg/L copper exceeding the criterion 0.0014 mg/L.

Heavy metal concentrations in surface waters are considered reflective of runoff from the surrounding urban/agricultural environmental setting with some of the upgradient area undergoing extensive civil works for commercial/industrial development at the time of sampling.

5.4.3 PAHs

All concentrations of PAHs were reported below the laboratory LOR for all samples submitted for analysis.

5.4.4 TRH/BTEX

All concentrations of TRH/BTEX were reported below the laboratory LOR for all samples submitted for analysis.

Oil and grease was detected at 17 mg/L at sample locations SW01 and SW02.

5.4.5 Ammonia

Ammonia concentrations were below the adopted site criteria at all sample locations.

5.4.6 Phosphorous Reactive

Concentrations of reactive phosphorous were below the laboratory LOR for all samples submitted for analysis.

5.4.7 Fluoride

Fluoride concentrations were below the adopted site criteria at all sample locations.

5.4.8 Nitrate and Nitrite

Nitrate and nitrite concentrations were below the adopted assessment criteria in all samples.

5.4.9 Major Anions/Cations

Concentrations of major anions and cations are presented in **Table A, Attachment D**.

A Piper plot of major cation and anion data for surface water samples is provided in **Attachment I**, which indicates that the major ion composition of SW03 is sodium-chloride dominated, while SW01 and SW02 are of mixed composition, with sodium-chloride and calcium/magnesium-bicarbonate being the major ions.

The groundwater and surface water sampling locations are shown on **Figure 2** with analyte concentrations exceeding assessment criteria displayed on **Figure 3**. Results of groundwater and surface water analysis are summarised in **Table A** in **Attachment D**. Groundwater sampling field data sheets are provided in **Attachment** E and Laboratory certificates of analysis are provided in **Attachment G**.

6. Conclusions

The groundwater monitoring event and surface water sampling provides a groundwater and surface water quality data for the site. Based on the scope of work completed for this investigation and the limitations described in **Attachment A**, the following conclusions are drawn with regard to the site:

- Elevated levels of several heavy metals were recorded in all monitoring wells sampled at the site, however these are considered to reflect background conditions within the hydrogeological setting of the site. All other COPCs were below the adopted site criteria; and
- Elevated levels of some heavy metals were recorded in two of the surface water samples submitted for analysis, however, these are considered reflective of the underlying geology (comprising Bringelly Shale) and the surrounding urban/agricultural environmental setting and some of the surrounding areas currently undergoing extensive civil works for commercial/industrial development. All other COPCs were below the adopted site criteria.

Should you require clarification, please contact the undersigned on 02 8245 0300 or by email jdemartin@jbsg.com.au.

Yours sincerely:	Reviewed/Approved by:
	J. De
Skye Tranfa Project Consultant JBS&G Australia Pty Ltd	John De Martin Senior Principal JBS&G Australia Pty Ltd

Attachments:

Attachment A	Limitations
Attachment B	Figures
Attachment C	Photographic Log
Attachment D	Summary Tables
Attachment E	Field Data Sheets
Attachment F	Decontamination and Calibration Certificates
Attachment G	Laboratory Certificates of Analysis
Attachment H	QA/QC Results
Attachment I	Piper Plot of Groundwater and Surface Water

Attachment A Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The report has been prepared specifically for the client for the purposes of the commission, and no warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be amended in any way without prior approval by JBS&G, or reproduced other than in full including all attachments as originally provided to the client by JBS&G.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements or agreed scope of work.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Attachment B Figures

Legend

🟥 Approximate Site Boundary

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: L02 Rev A	Date 11/13/2025
Drawn By: JL	Checked By: ST

Scale 1:25,000

0 230 460

metres

Coord. Sys. GDA2020 MGA Zone 56

Lot 10 DP1280592,
706-752 Mamre Road
Kemps Creek, NSW

SITE LOCATION

FIGURE 1

File Name: 70548_Lot1MamreRoadKempsCreeks_L02RevA
Reference: © OpenStreetMap (and) contributors, CC-BY-SA

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: L02 Rev A	Date 11/13/2025
Drawn By: JL	Checked By: ST

Scale 1:5,255

0 40 80
metres

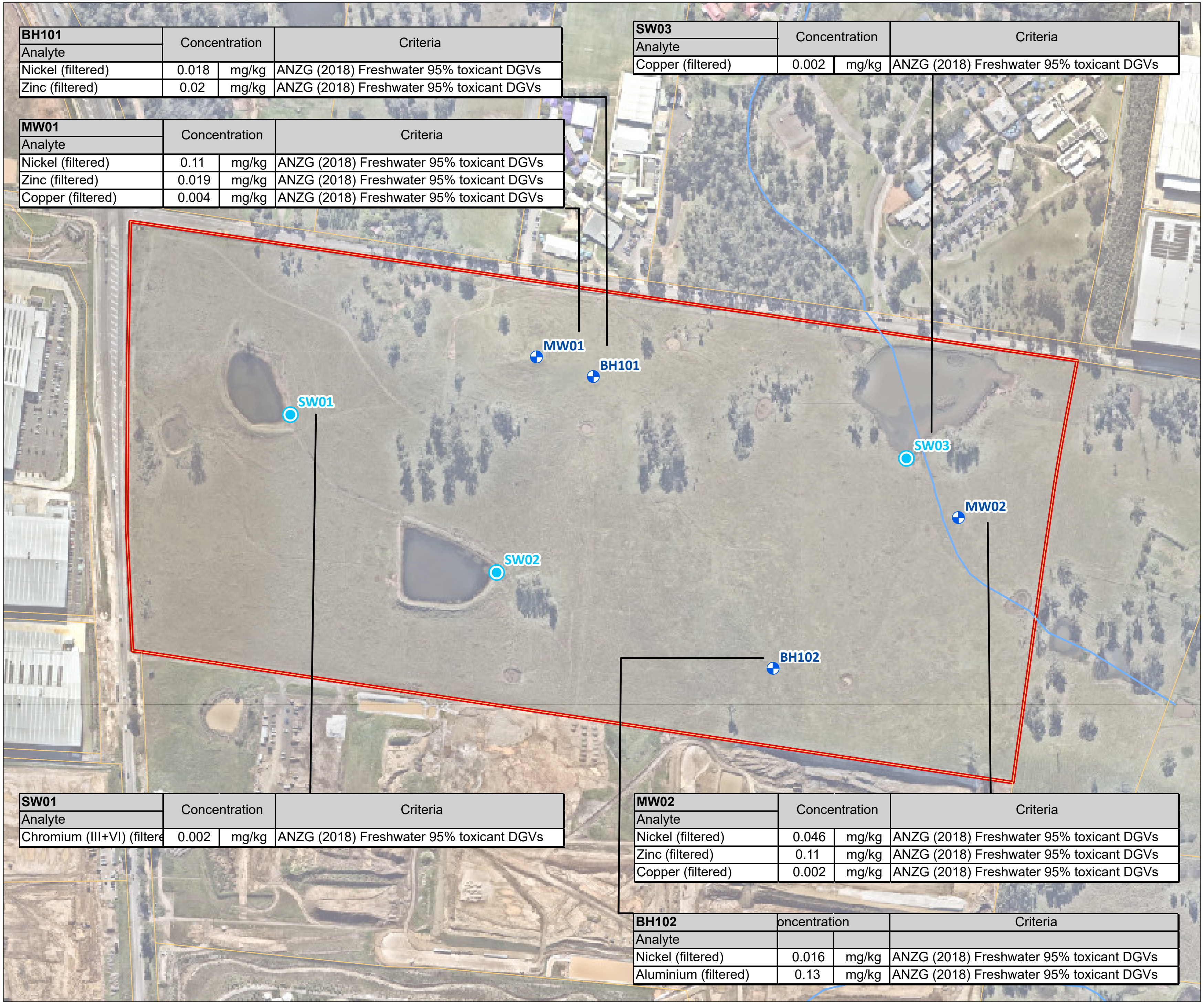
Coord. Sys. GDA2020 MGA Zone 56

Lot 10 DP1280592,
706-752 Mamre Road
Kemps Creek, NSW

SITE LAYOUT AND SAMPLE LOCATIONS

FIGURE 2

File Name: 70548_Lot1MamreRoadKempsCreeks_L02RevA
Reference: Nearmap - www.nearmap.com (Capture Date: 30/05/2025)
NSW Collaboration Portal - https://portal.spatial.nsw.gov.au/client/services?id=f1b1b26b23ab4574a561f890edd3bd7e



BH101	Concentration		Criteria
Analyte			
Nickel (filtered)	0.018	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Zinc (filtered)	0.02	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

MW01	Concentration		Criteria
Analyte			
Nickel (filtered)	0.11	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Zinc (filtered)	0.019	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Copper (filtered)	0.004	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

SW03	Concentration		Criteria
Analyte			
Copper (filtered)	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

SW01	Concentration		Criteria
Analyte			
Chromium (III+VI) (filtere	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

MW02	Concentration		Criteria
Analyte			
Nickel (filtered)	0.046	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Zinc (filtered)	0.11	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Copper (filtered)	0.002	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

BH102	oncentration		Criteria
Analyte			
Nickel (filtered)	0.016	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs
Aluminium (filtered)	0.13	mg/kg	ANZG (2018) Freshwater 95% toxicant DGVs

Legend
🟥 Approximate Site Boundary
▭ NSW Cadastre
— Hydro Line
Sample Locations
⊕ Groundwater Well
◉ Surface Water Samples

JBS&G

Job No: 70548

Client: Plan Project Management Pty Ltd

Version: L02 Rev A	Date 11/13/2025
Drawn By: JL	Checked By: ST

Scale 1:6,000

0 50 100
metres

Coord. Sys. GDA2020 MGA Zone 56

Lot 10 DP1280592,
706-752 Mamre Road
Kemps Creek, NSW

EXCEEDANCES

FIGURE 3

File Name: 70548_Lot1MamreRoadKempsCreeks_L02RevA
Reference: Nearmap - www.nearmap.com (Capture Date: 30/05/2025)
NSW Collaboration Portal - https://portal.spatial.nsw.gov.au/client/services?id=f1b1b26b23ab4574a561f890edd3bd7e

Attachment C Photographic Log

PHOTOGRAPH 1: SITE, SOUTH FACING

PHOTOGRAPH 2: SITE, EAST FACING

PHOTOGRAPH 3: SITE, WEST FACING

PHOTOGRAPH 4: SITE, WEST FACING

Job No: 70548

Client: Plan Project Management

Version: L02 Rev A	Date: 31/11/2025
Drawn By: ST	Checked By: JDM

Not to Scale

Coord. Sys n/a

Groundwater Monitoring Event and Expanded Surface Water Sampling Assessment

706-752 Mamre Rd, Kemps Creek, NSW

ATTACHMENT C

PHOTOGRAPH 5: MW01 LOCATION

PHOTOGRAPH 6: BH101 LOCATION

PHOTOGRAPH 7: BH102 LOCATION

PHOTOGRAPH 8: BH102 WATER

Job No: 70548

Client: Plan Project Management

Version: L02 Rev A	Date: 11/11/2025
Drawn By: ST	Checked By: JDM

Not to Scale

Coord. Sys n/a

Groundwater Monitoring Event and Expanded Surface Water Sampling Assessment

706-752 Mamre Rd, Kemps Creek, NSW

ATTACHMENT C

PHOTOGRAPH 9: BH101 WATER

PHOTOGRAPH 10: SW01

PHOTOGRAPH 11: SW02

PHOTOGRAPH 12: SW03

Job No: 70548

Client: Plan Project Management

Version: L02 Rev A

Date: 11/11/2025

Drawn By: ST

Checked By: JDM

Not to Scale

Coord. Sys n/a

Groundwater Monitoring Event and Expanded Surface Water Sampling Assessment

706-752 Mamre Rd, Kemps Creek, NSW

ATTACHMENT C

Attachment D Summary Tables

TABLE A, WATER ANALYTICAL SUMMARY TABLE

Project Number: 70548

Project Name: Mamre Road Kemps Creek, Plan Project Management

			Metals & Metalloids														TPH	TPHs (NEPC 1999)					TRHs (NEPC 2013)						
			Aluminium (filtered)	Arsenic (filtered)	Barium (filtered)	Boron (filtered)	Cadmium (filtered)	Chromium (III+VI) (filtered)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Mercury (filtered)	Nickel (filtered)	Selenium (filtered)	Zinc (filtered)	Oil and Grease	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum of Total)	C6-C10	C10-C16	C16-C34	C34-C40	C10-C40 (Sum of total)	F1 (C6-C10 minus BTEX)	F2 (C10-C16 less Naphthalene)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.01	0.001	0.001	0.05	0.0001	0.001	0.001	0.05	0.001	0.001	0.0001	0.001	0.001	0.005	5	0.02	0.05	0.1	0.05	0.05	0.02	0.05	0.1	0.1	0.1	0.02	0.05
ANZG (2018) Freshwater 95% toxicant DGVs			0.055	0.013		0.94	0.0002	0.001	0.0014		0.0034	1.9	0.0006	0.011	0.011	0.008													
ANZG (2018) Freshwater 95% toxicant DGVs total ammonia at different pH ANZECC & ARMCANZ (2000)																													
Field ID	**Date**	**Lab Report Number**																											
Groundwater Samples																													
BH101	04 Nov 2025	1287948	<0.05	0.007	0.48	<0.05	<0.0002	<0.001	<0.001	0.14	<0.001	0.30	<0.0001	0.018	<0.001	0.020	-	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
BH102	04 Nov 2025	1287948	0.13	0.010	0.48	<0.05	<0.0002	<0.001	<0.001	0.62	<0.001	0.76	<0.0001	0.016	<0.001	0.006	-	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
MW01	04 Nov 2025	1287948	<0.05	<0.001	0.05	<0.05	<0.0002	<0.001	0.004	<0.05	0.001	<0.005	<0.0001	0.11	<0.001	0.019	-	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
MW02	04 Nov 2025	1287948	<0.05	<0.001	0.03	<0.05	<0.0002	0.001	0.002	<0.05	0.003	0.007	<0.0001	0.046	<0.001	0.11	-	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
Surface Water Samples																													
SW01	04 Nov 2025	1287948	<0.05	<0.001	0.07	<0.05	<0.0002	0.002	<0.001	0.11	<0.001	0.032	<0.0001	<0.001	<0.001	<0.005	17	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
SW02	04 Nov 2025	1287948	<0.05	<0.001	0.04	<0.05	<0.0002	<0.001	<0.001	0.10	<0.001	0.027	<0.0001	0.001	<0.001	<0.005	17	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
SW03	04 Nov 2025	1287948	<0.05	<0.001	0.08	<0.05	<0.0002	<0.001	0.002	<0.05	<0.001	0.35	<0.0001	0.004	<0.001	<0.005	<10	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
QC20251104_01(duplicate of SW03)	04 Nov 2025	1287948	<0.05	<0.001	0.10	<0.05	<0.0002	<0.001	<0.001	<0.05	<0.001	0.43	<0.0001	<0.001	<0.001	<0.005	<10	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05	<0.1	<0.1	<0.1	<0.02	<0.05
QC20251104_01 (triplicate of SW03)	04 Nov 2025	ES2534602	0.01	<0.001	0.101	<0.05	<0.0001	<0.001	<0.001	<0.05	<0.001	0.440	<0.0001	<0.001	<0.010	<0.005	<5	<0.02	<0.05	<0.1	<0.05	<0.05	<0.02	<0.1	<0.1	<0.1	<0.1	<0.02	<0.1

TABLE A, WATER ANALYTICAL SUMMARY TABLE

Project Number: 70548

Project Name: Mamre Road Kemps Creek, Plan Project Management

			BTEXN								PAH																	
			Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	Naphthalene_VOC	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ calc (Zero)	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum of total)
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.001	0.001	0.001	0.001	0.002	0.002	0.001	0.005	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.0005
ANZG (2018) Freshwater 95% toxicant DGVs			0.95	0.18	0.08	0.35	0.075			0.016			0.0004		0.0002							0.0014			0.016	0.002		
ANZG (2018) Freshwater 95% toxicant DGVs total ammonia at different pH ANZECC & ARMCANZ (2000)																												
Field ID	**Date**	**Lab Report Number**																										
Groundwater Samples																												
BH101	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BH102	04 Nov 2025	1287948	<0.001	0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW01	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
MW02	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Surface Water Samples																												
SW01	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SW02	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
SW03	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QC20251104_01(duplicate of SW03)	04 Nov 2025	1287948	<0.001	<0.001	<0.001	<0.001	<0.002	<0.003	-	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
QC20251104_01 (triplicate of SW03)	04 Nov 2025	ES2534602	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005

TABLE A, WATER ANALYTICAL SUMMARY TABLE

Project Number: 70548
Project Name: Mamre Road Kemps Creek, Plan Project Management

			Non-Metallic Inorganics							Major Cations								Major Anions							Ionic Balance				Other	
			Phosphorus reactive (as P)	Phosphorus reactive (as P) (filtered)	Ammonia as N	Fluoride	Nitrate (as N)	Nitrite (as N)	Nitrite + Nitrate as N	Calcium	Calcium (filtered)	Potassium	Potassium (filtered)	Magnesium	Magnesium (filtered)	Sodium	Sodium (filtered)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Sulphate as SO4 - Turbidimetric (filtered)	Alkalinity (Bicarbonate as CaCO3)	Chloride	Sulphate	Ionic Balance	pH (Lab)	Cations Total	Anions Total	TDS	TSS
			MG/KG	MG/KG	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	%	pH Units	meq/L	meq/L	mg/L	mg/L
EQL			0.01	0.01	0.01	0.1	0.01	0.01	0.01	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	2	0.01	0.01	0.01	0.01	10	5
ANZG (2018) Freshwater 95% toxicant DGVs					N/A		2.4																							
ANZG (2018) Freshwater 95% toxicant DGVs total ammonia at different pH ANZECC & ARMCANZ (2000)					result (pH specific criteria)																									
Field ID	**Date**	**Lab Report Number**																												
Groundwater Samples																														
BH101	04 Nov 2025	1287948	<0.05	-	2.2 (2.33)	<1	0.12	0.17	0.29	120	-	26	-	190	-	1,700	-	<20	<20	1,100	-	1,100	2,800	170	-	7.5	-	-	5,200	-
BH102	04 Nov 2025	1287948	<0.05	-	0.28 (2.26)	<0.5	<0.02	<0.02	<0.05	82	-	15	-	84	-	510	-	<20	<20	810	-	810	540	<10	-	7.2	-	-	1,700	-
MW01	04 Nov 2025	1287948	<0.05	-	<0.01 (2.38)	<0.5	0.23	<0.02	0.25	96	-	11	-	140	-	770	-	<20	<20	970	-	970	1,000	110	-	7.2	-	-	2,600	-
MW02	04 Nov 2025	1287948	<0.05	-	0.01 (2.33)	<5	0.02	<0.02	<0.05	110	-	17	-	520	-	4,500	-	<20	<20	1,500	-	1,500	8,700	380	-	7.1	-	-	13,000	-
Surface Water Samples																														
SW01	04 Nov 2025	1287948	<0.05	-	0.01 (0.18)	0.3	<0.02	<0.02	<0.05	12	-	2.7	-	4.8	-	15	-	<20	<20	66	-	49	28	2.0	-	8.8	-	-	92	44
SW02	04 Nov 2025	1287948	<0.05	-	<0.01 (0.66)	0.2	<0.02	<0.02	<0.05	3.1	-	2.7	-	5.1	-	17	-	<20	<20	41	-	41	14	2.2	-	7.8	-	-	86	11
SW03	04 Nov 2025	1287948	<0.05	-	0.02 (1.03)	0.2	<0.02	<0.02	<0.05	22	-	5.2	-	25	-	150	-	<20	<20	84	-	84	240	10	-	7.7	-	-	550	8.2
QC20251104_01(duplicate of SW03)	04 Nov 2025	1287948	<0.05	-	<0.01 (1.03)	0.2	<0.02	<0.02	<0.05	21	-	5.1	-	25	-	130	-	<20	<20	81	-	81	240	9.9	-	7.6	-	-	550	20
QC20251104_01 (triplicate of SW03)	04 Nov 2025	ES2534602	-	<0.01	0.01 (1.03)	0.2	0.01	<0.01	0.01	-	22	-	5	-	26	-	132	<1	<1	93	14	93	257	-	1.58	7.67	9.11	9.40	486	18

Attachment E Field Data Sheets

Groundwater Gauging Data

PROJECT NAME: Remos Creek.	**PROJECT NO:** 70598
FIELDWORK DATES: 4/11/25	**SAMPLERS:** S.Tranfa, A.Carruthers
TYPE OF INVESTIGATION: GME.	**PROJECT MANAGER:** JDM

WELL ID	DATE	TIME	DEPTH TO LNAPL (mbtoc)	DEPTH TO WATER (mbtoc)	DEPTH TO DNAPL (mbtoc)	TOTAL DEPTH (mbtoc)	NAPL VISUALLY VERIFIED	COMMENTS
MW01	4/11/25	0711	-	15.182	-	19.70	-	
BH101	↓	0840	-	15.366	-	17.17	-	
BH102		1008	-	10.713	-	12.64.	-	
MW02		1059	-	1.961	-	6.56	-	

Notes: no well cap @ BH102.

Primary sample ID:		**No.**	**Container / Preservative**
Duplicate sample:	YES / NO ID:		
Triplicate sample:	YES / NO ID:		
Rinsate sample:	YES / NO ID:		
Sample on ice:	YES / NO		
Field Filter Method:	0.45µm filter / not filtered		
Water Quality Metre:			
Gauging Equipment:			
Pump Type:			
NOTES:			

*Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)*

Casing Diameter	**25mm**	**50mm**	**100mm**	**150mm**	**300mm**
Conversion Factor	**0.98**	**1.96**	**7.85**	**49.1**	**196.3**

*Volume of water in well (L) = ∏ * radius of gravel pack (m)2 * height of water column (m)*

**SA EPA Guidelines (June 2007) as referenced in NEPM*

JBS&G

Groundwater Sampling Form

PROJECT NAME: Mamre Road	**PROJECT NO:** 70548
SAMPLING DATES: 4/11/25	**SAMPLERS:** AC/ST
TYPE OF INVESTIGATION: GME	**PROJECT MANAGER:** JDM
WELL ID: MW01	**WEATHER:** Sunny

Casing Diameter (mm):	50	**Depth to NAPL (mBTOC):**	—
Well Completion:	[✓ Flush Mount] / Monument	**Depth to SWL (mBTOC):**	15.182
Well Cap Type:	[✓ Locking Cap] / PVC / Other	**NAPL Thickness (m):**	—
Well Condition:	[✓ Good] / Compromised	**Depth to EoH (mbtoc):**	19.70
Calculated Well Volume (L):	8.855	**Water Column Depth (m):**	4.518
Sampling Method:	Bladder.	**NAPL Visually Verified?**	—
Purge Volume	4 Casings Vol. (L)		
Low Flow	Pump Submersion depth (mBTOC)		

TIME	VOLUME PURGED L	DSSOLVED OXYGEN ☐ % ☑ mgL/ppm	TEMP °C	pH pH units	SPC EC µS/cm	ORP mV	Comments Inc SWL for low flow (mBTOC)
0753	0.3	3.12	18.9	6.72	4561	157.7	15.105
0756	0.6	2.78	18.9	6.72	4559	161.9	14.985
0759	0.9	2.74	19.0	6.72	4543	164.7	15.150
0802	1.2	2.75	19.0	6.72	4541	165.7	15.105.
Acceptable Variations*		+/-10%	+/- 0.2 °C	+/-0.05 pH	+/-3%	+/-10mV	Results Acceptable: YES / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Clear	**Sheen:**	YES / [✓ NO]
Colour:	Colourless	**Odour:**	YES / [✓ NO]

Groundwater Sampling Form (Rev2)
Controlled Copy (25 March 2019)

Primary sample ID:	MW01	**No.**	**Container / Preservative**
Duplicate sample:	YES / [✓ NO] ID:	1	1L Amber
Triplicate sample:	YES / [✓ NO] ID:	2	Heavy metals (Filtered)
Rinsate sample:	[✓ YES] / NO ID: RINSATE	2	500mL organics
Sample on ice:	[✓ YES] / NO	2	Vials
Field Filter Method:	[✓ 0.45µm filter] / not filtered	1	Pres. inorganics
Water Quality Metre:	YSI	1	Iron (Filtered)
Gauging Equipment:	IP Heron		
Pump Type:	Bladder		
NOTES:			

*Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)*

Casing Diameter	**25mm**	**50mm**	**100mm**	**150mm**	**300mm**
Conversion Factor	**0.98**	**1.96**	**7.85**	**49.1**	**196.3**

*Volume of water in well (L) = ∏ * radius of gravel pack (m)2 * height of water column (m)*

**SA EPA Guidelines (June 2007) as referenced in NEPM*

JBS&G

Groundwater Sampling Form

PROJECT NAME: Mamre Rd SEARS	**PROJECT NO:** 70548
SAMPLING DATES: 4/11/25	**SAMPLERS:** AC/ST
TYPE OF INVESTIGATION: GME	**PROJECT MANAGER:** JDM
WELL ID: MW02	**WEATHER:** Sunny

Casing Diameter (mm):	50	**Depth to NAPL (mBTOC):**	—
Well Completion:	Flush Mount / [✓ Monument]	**Depth to SWL (mBTOC):**	1.961
Well Cap Type:	Locking Cap / [✓ PVC] / Other	**NAPL Thickness (m):**	—
Well Condition:	[✓ Good] / Compromised	**Depth to EoH (mbtoc):**	6.56
Calculated Well Volume (L):	9.014	**Water Column Depth (m):**	4.599
Sampling Method:	Bladder	**NAPL Visually Verified?**	—
Purge Volume	4 Casings Vol. (L)		
Low Flow	Pump Submersion depth (mBTOC)		

Monument
= 0.9m above ground level.

TIME	VOLUME PURGED L	DSSOLVED OXYGEN ☐ % ☑ mgL/ppm	TEMP °C	pH pH units	EC µS/cm	ORP mV	Comments Inc SWL for low flow (mBTOC)
1108	0.3	8.99	19.3	6.74	22639	125.8	1.852
1111	0.6	4.86	19.0	6.79	22819	115.9	1.849
1114	0.9	2.73	18.9	6.80	22840	112.4	1.758
1117	1.3	2.57	18.8	6.80	22838	111.8	1.740
Acceptable Variations*		+/-10%	+/- 0.2 °C	+/-0.05 pH	+/-3%	+/-10mV	Results Acceptable: YES / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	S. turbid.	**Sheen:**	YES / [✓ NO]
Colour:	l. grey.	**Odour:**	YES / [✓ NO]

Primary sample ID:	MW02	**No.**	**Container / Preservative**
Duplicate sample:	YES / [✓ NO] ID:	1	1L Amber
Triplicate sample:	YES / [✓ NO] ID:	2	organic (500mL)
Rinsate sample:	YES / [✓ NO] ID:	2	metals (filtered)
Sample on ice:	[✓ YES] / NO	1	pres. inorganics
Field Filter Method:	[✓ 0.45µm filter] / not filtered	1	iron (filtered)
Water Quality Metre:	YSI	2	vials.
Gauging Equipment:	IP heron		
Pump Type:	Bladder		
NOTES:			

*Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)*

Casing Diameter	**25mm**	**50mm**	**100mm**	**150mm**	**300mm**
Conversion Factor	**0.98**	**1.96**	**7.85**	**49.1**	**196.3**

*Volume of water in well (L) = ∏ * radius of gravel pack (m)2 * height of water column (m)*

**SA EPA Guidelines (June 2007) as referenced in NEPM*

JBS&G

Groundwater Sampling Form

PROJECT NAME: Monroe Rd SEARS	**PROJECT NO:** 70548
SAMPLING DATES: 4/11/25	**SAMPLERS:** AE / ST
TYPE OF INVESTIGATION: GME.	**PROJECT MANAGER:** JDM
WELL ID: BH101	**WEATHER:** Sunny

Casing Diameter (mm): 50		**Depth to NAPL (mBTOC):** —
Well Completion:	Flush Mount / [✓ Monument]	**Depth to SWL (mBTOC):** 15.306
Well Cap Type:	[✓ Locking Cap] / PVC / Other	**NAPL Thickness (m):** —
Well Condition:	[✓ Good] / ~~Compromised~~ [illegible]	**Depth to EoH (mbtoc):** 17.17
Calculated Well Volume (L): 3.653		**Water Column Depth (m):** 1.864
Sampling Method: Bladder.		**NAPL Visually Verified?** —
Purge Volume	4 Casings Vol. (L)	monument = 1.12m above ground level.
Low Flow	Pump Submersion depth (mBTOC)	

TIME	VOLUME PURGED L	DSSOLVED OXYGEN ☐ % ☒ mgL/ppm	TEMP °C	pH pH units	EC _S/cm	ORP mV	Comments Inc SWL for low flow (mBTOC)
09:03	0.3	1.65	19.4	6.89	9580	166.7	15.285
0906	0.6	1.14	19.3	6.82	9599	165.0	15.595
0909	[illegible]	1.14	19.3	6.80	9594	164.2	16.015
							* Ran out of water, even after leaving for a while. Only small amber and organics collected.
Acceptable Variations*		+/-10%	+/- 0.2 °C	+/-0.05 pH	+/-3%	+/-10mV	Results Acceptable: YES / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Clear	**Sheen:**	YES / [✓ NO]
Colour:	Colourless	**Odour:**	YES / [✓ NO]

Primary sample ID:	BH101	**No.**	**Container / Preservative**
Duplicate sample:	YES / [✓ NO] ID:	1	500mL Amber
Triplicate sample:	YES / [✓ NO] ID:	1.5	Organics (500mL)
Rinsate sample:	YES / [✓ NO] ID:	2	vials
Sample on ice:	[✓ YES] / NO	2	Metals (filtered)
Field Filter Method:	[✓ 0.45µm filter] / not filtered	1	pres. inorganics
Water Quality Metre:	YSI	1	iron (filtered).
Gauging Equipment:	IP Heron		
Pump Type:	Bladder		
NOTES:			

*Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)*

Casing Diameter	**25mm**	**50mm**	**100mm**	**150mm**	**300mm**
Conversion Factor	**0.98**	**1.96**	**7.85**	**49.1**	**196.3**

*Volume of water in well (L) = ∏ * radius of gravel pack (m)2 * height of water column (m)*

**SA EPA Guidelines (June 2007) as referenced in NEPM*

JBS&G

Groundwater Sampling Form

PROJECT NAME: mamred rd SEARS	**PROJECT NO:** 70548
SAMPLING DATES: 9/11/25	**SAMPLERS:** AC/ST
TYPE OF INVESTIGATION: GME.	**PROJECT MANAGER:** JOM
WELL ID: BH102	**WEATHER:** Sunny/rain

Casing Diameter (mm): 50		**Depth to NAPL (mBTOC):** –
Well Completion:	Flush Mount / [✓ Monument]	**Depth to SWL (mBTOC):** 10.713
Well Cap Type:	Locking Cap / PVC / Other none	**NAPL Thickness (m):** –
Well Condition:	[✓ Good] / Compromised	**Depth to EoH (mbtoc):** 12.64
Calculated Well Volume (L): 3.777		**Water Column Depth (m):** 1.927
Sampling Method: Bladder.		**NAPL Visually Verified?** –
Purge Volume	4 Casings Vol. (L)	
Low Flow	Pump Submersion depth (mBTOC)	0.5m

*no well cap.

TIME	VOLUME PURGED L	DSSOLVED OXYGEN ☐ % ☑ mgL/ppm	TEMP °C	pH pH units	EC µS/cm	ORP mV	Comments Inc SWL for low flow (mBTOC)
1024	0.3	78.1	20.0	7.11	2807	14.2	10.713
1027	0.6	28.7	19.3	7.00	2828	-55.9	10.910
1030	0.9	0.62	19.1	6.92	2840	-144.9	10.991
1033	1.1	0.56	19.0	6.89	2848	-148.9	11.201
1036	1.2	0.55	19.0	6.88	2853	-150.0	11.255
Acceptable Variations*		+/-10%	+/- 0.2 °C	+/-0.05 pH	+/-3%	+/-10mV	Results Acceptable: YES / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	l.grey	**Sheen:**	YES / [✓ NO]
Colour:	v. turbid.	**Odour:**	[✓ YES] / NO

(Strong)
Hydrogen sulfide odour

Primary sample ID:	BH102	**No.**	**Container / Preservative**
Duplicate sample:	YES / [✓ NO] ID:	1	1L Amber
Triplicate sample:	YES / [✓ NO] ID:	2	500mL organics
Rinsate sample:	YES / [✓ NO] ID:	2	metals (filtered)
Sample on ice:	[✓ YES] / NO	2	vials
Field Filter Method:	[✓ 0.45µm filter] / not filtered	1	pres. inorganics
Water Quality Metre:	YSI	1	iron (filtered).
Gauging Equipment:	IP Heron		
Pump Type:	Bladder		
NOTES:			

*Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)*

Casing Diameter	**25mm**	**50mm**	**100mm**	**150mm**	**300mm**
Conversion Factor	**0.98**	**1.96**	**7.85**	**49.1**	**196.3**

*Volume of water in well (L) = ∏ * radius of gravel pack (m)2 * height of water column (m)*

**SA EPA Guidelines (June 2007) as referenced in NEPM*

Attachment F Decontamination and Calibration Certificates

Field Equipment Calibration and Decontamination

PROJECT NAME: Mamre rd SEARS	**PROJECT NO:** 70548
FIELDWORK DATES: 4/11/25	**SAMPLERS:** AC / ST
TYPE OF INVESTIGATION: GME.	**PROJECT MANAGER:** JDM

CALIBRATION SUMMARY

EQUIPMENT: Hired, certificates in folder.

CALIBRATION STANDARD:

DATE	TIME	READING (ppm)	COMMENTS

DECONTAMINATION SUMMARY

EQUIPMENT: IP, WQM, Bladder

1	Was the equipment decontaminated appropriately prior to sampling at each location?	[✓ Y]	N	NA
2	Was excess soil removed by scraping, brushing or wiping with disposable towels?	[✓ Y]	N	NA
3	Was the equipment contaminated with grease, tar or similar material?	Y	[✓ N]	NA
	If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y	N	[✓ NA]
4	Was phosphate-free detergent used to wash the equipment?	[✓ Y]	N	NA
5	Was the equipment rinsed with clean water?	[✓ Y]	N	NA
6	Was the equipment then rinsed with deionised water?	[✓ Y]	N	NA
7	Were all sample containers cleaned and acid or solvent washed prior to sample collection?	[✓ Y]	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS

Fresh pair of gloves and tubing at every location.

Calibration and Service Report

ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	Manufacturer:	QED	Serial #:	1254
Address:	9/171 Power Street GLENDENNING NSW 2761	Instrum./Model:	MP15	H. Cable:	50m
Phone:	02 9730 2019	Client Company:	JBS&G	Client Email:	
Email:	rentals@experttesting.com.au	Client Name:	Skye	Client Phone:	

Equipment Check

MP Kit QMP15

Customer:	GJBS&G	**Manufacturer:**	QED
Contact:	Skye	**Instrument:**	QMP15
Order:		**Serial #:**	1254
		Pump S/N #:	145022
		Cable length:	60m

Item	Test	Pass	Comments
QMP15	Condition	✓	
	Gas Regulator	✓	
	Wrench & Tube cutter	✓	
Pump	Decontaminated	✓	
	Condition	✓	
	Bladder Fitted	✓	
	Fittings	✓	New
CO2 Gas Bottle	Full	✓	
Spare CO2	6 Spare Bottles	✓	
MP Kit: QMP15 and Pump Test	Operation checked	✓	
Instruction manual	Included	✓	

Comments

6 spare bottles.

This is to certify that the above instrument has been checked and is in good working order.

Checked By: Milenko Sisic

Check Date: 03.11.2025 Due for Check: 03.05.2026

EXPERT TESTING SERVICES

Calibration and Service Report

ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	**Manufacturer:**	Solinst	**Serial #:**	484485
Address:	9/171 Power Street GLENDENNING NSW 2761	**Instrum./Model:**	Interface Probe 122	**Tape Length:**	30m
Phone:	02 9730 2019	**Client Company:**	JBS&G	**Client Email:**	
Email:	rentals@experttesting.com.au	**Client Name:**	Skye	**Client Phone:**	

Equipment Check

Oil/Water Interface Meter - Solinst 122 Interface Meter

Customer:	JBS&G	**Manufacturer:**	Solinst Interface Meter
Contact:	sKYE	**Instrument:**	Model 122
Order:		**Serial #:**	484485
		Tape length:	30m

Item	Test	Pass	Comments
Battery	Voltage (2 x 9v battery)	✓	Voltage above 7.9v
	Fuses	✓	
	Capacity	✓	
Probe	Decontaminated	✓	
	Condition	✓	
	Operation	✓	
Connectors	Condition	✓	
Tape Check	Condition	✓	
	Decontaminated	✓	
Instrument Test	At surface level	✓	Tap water and Petrol
Speaker	Operation	✓	

Comments

New unit.

This is to certify that the above instrument has been checked and is in good working order.

Checked By: Milenko Sisic

Check Date: 03.11.2025

Due for Check: 03.05.2026

EXPERT TESTING SERVICES

Calibration and Service Report

ABN: 74 619 717 350
Contact: 02 9730 2019
Email: rentals@experttesting.com.au
9/171 Power Street, Glendenning NSW 2761
Web: www.experttesting.com.au

Company:	Expert Testing Services (Hire) Pty Ltd	**Manufacturer:**	YSI	**Serial #:**	21J102884
Address:	9/171 Power Street GLENDENNING NSW 2761	**Instrum./Model:**	Pro Quatro	**Cable S/N:**	25F100186
Phone:	02 9730 2019	**Client Company:**	JBS&G	**Client Email:**	
Email:	rentals@experttesting.com.au	**Client Name:**	Skye Tranfa	**Client Phone:**	

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 60 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.79
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	
pH slope		✓	55 to 60 mV/pH; ideal 59mV
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	Variance range ± 20mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

				Instrument Readings		
Parameter	Standards	Reference	Calibration Point	Before	After	Units
Temperature	Hanna HI98509; SN:31E0C9	Room Temp.	21.9	N/A	21.9	°C
pH	pH 4.00	433231	4.00	4.00	4.00	pH
pH	pH 7.00	431241	7.01	7.02	7.01	pH
Conductivity	2760 µs/cm at 25°C	411815	2760	2759	2760	µs/cm
ORP (Ref. check only)	Zobell A & B	428645 & 428646	236.0	254.3	236.0	mV
Zero Dissolved Oxygen	NaSO3 in distilled water	3222201	0.0	0.3	0.0	%
100% Dissolved Oxygen	100% Air Saturation	Fresh Air	98.7	94.4	98.7	%

Checked By: Milenko Sisic
Check Date: 03.11.2025
Due for Check: 03.05.2026

Attachment G Laboratory Certificates of Analysis

1287948

Chain of custody

JBS&G

PROJECT NO (Esdat Ref.): 70548	LAB: Eurofins.	LABORATORY BATCH NO.:
PROJECT NAME: 706-752 Mamre Road, Kemps Creek	SAMPLERS: Skye Tranfa and Alicia Carruthers	
DATE NEEDED BY: 3 day TAT	QC LEVEL: NEPM (2013)	

PHONE: Sydney 02 8245 0300 | Perth 08 9380 3100 | Brisbane 07 3211 5350 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113 | Hobart 03 6208 3700

SEND REPORT TO: (1) jbsglabresults@jbsg.com.au; (2) stranfa@jbsg.com.au; (3) jdemartin@jbsg.com.au (4) acarruthers@jbsg.com.au 5) jcarr@jbsg.com.au.

PROJECT MANAGER NAME TO APPEAR ON INVOICES: John De Martin…………………………………………. | **SEND INVOICES TO: invoices@jbsg.com.au**

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	pH	TDS	Major Cations and anions (sodium, potassium, calcium, magnesium, chloride, sulfate, alkalinity (speciated))	Metals (Al, As, Ba, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Se, Fe, Mn, Zn)	Fluoride	Nutrients (nitrate, nitrite, ammonia, orthophosphate)	PAHs	TRHs/TPHs	BTEX	TSS	Oil and grease		NOTES:
MW01	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber		X	X	X	X	X	X	X	X	X				
BH101	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 500mL amber		X	X	X	X	X	X	X	X	X				
BH102	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber		X	X	X	X	X	X	X	X	X				
MW02	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber		X	X	X	X	X	X	X	X	X				
SW01	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber, 2x oil and grease		X	X	X	X	X	X	X	X	X	X	X		
SW02	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber, 2x oil and grease		X	X	X	X	X	X	X	X	X	X	X		
SW03	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber, 2x oil and grease		X	X	X	X	X	X	X	X	X	X	X		
RINSATE	Water	4/11/2025		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber		X	X	X	X	X	X	X	X	X				

Fali 5:27 04/11/25 4.1 chill → Flip.

Chain of custody

JBS&G

TSTB	Water	4/11/2025		2x Vials										X				
QC20251104_01	↓	↓		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber, 2x oil and grease		X	X	X	X	X	X	X	X	X	X	X		

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Sieye Franke DATE: 4/11/25 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: DATE: OF:	COOLER SEAL – Yes……. No …….. Intact ………. Broken ………… COOLER TEMP ……. deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes……. No …….. Intact ………. Broken ………… COOLER TEMP ……. deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

eurofins Environment Testing

www.eurofins.com.au EnviroSales@eurofinsanz.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle	Perth
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive	46-48 Banksia Road
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West	Welshpool
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	NSW 2304	WA 6106
+61 3 8564 5000	+61 3 8564 5000	+61 2 9900 8400	+61 2 6113 8091	+61 7 3902 4600	+61 2 4968 8448	+61 8 6253 4444
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 2377
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794 & 2780	Site# 25079	Site# 2370 & 2554

Sample Receipt Advice

Company name:	JBS & G Australia (NSW) P/L
Contact name:	John De Martin
Project name:	706-752 MAMRE ROAD KEMPS CREEK
Project ID:	70548
Turnaround time:	3 Day
Date/Time received	Nov 4, 2025 5:27 PM
Eurofins reference	1287948

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	Sample Temperature of chilled sample on the batch as recorded by Eurofins Sample Receipt : 4.1 degrees Celsius.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Updated analysis.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Andrew Black on phone : (+61) 2 9900 8490 or by email: Andrew.Black@eurofinsanz.com

Results will be delivered electronically via email to John De Martin - jdemartin@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

Global Leader - Results you can trust

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

JBS & G Australia (NSW) P/L
Level 8, 179 Elizabeth St
Sydney
NSW 2000

Attention: **John De Martin**

Report	**1287948-W**
Project name	706-752 MAMRE ROAD KEMPS CREEK
Project ID	70548
Received Date	Nov 04, 2025

Client Sample ID **Sample Matrix** **Eurofins Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**MW01** **Water** **S25-No0006365** **Nov 04, 2025**	**BH101** **Water** **S25-No0006366** **Nov 04, 2025**	**BH102** **Water** **S25-No0006367** **Nov 04, 2025**	**MW02** **Water** **S25-No0006368** **Nov 04, 2025**
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	105	107	106	112
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			**MW01**	**BH101**	**BH102**	**MW02**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S25-No0006365**	**S25-No0006366**	**S25-No0006367**	**S25-No0006368**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	93	98	88	INT
p-Terphenyl-d14 (surr.)	1	%	125	131	99	98
Ammonia (as N)	0.01	mg/L	< 0.01	2.2	0.28	0.01
Chloride	1	mg/L	1000	2800	540	8700
Fluoride	0.1	mg/L	^{R16}< 0.5	^{R16}< 1	^{R16}< 0.5	^{R16}< 5
Nitrate & Nitrite (as N)	0.05	mg/L	0.25	0.29	< 0.05	< 0.05
Nitrate (as N)	0.02	mg/L	0.23	0.12	< 0.02	0.02
Nitrite (as N)	0.02	mg/L	< 0.02	0.17	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	7.2	7.5	7.2	7.1
Phosphorus reactive (as P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	2	mg/L	110	170	^{R16}< 10	380
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	2600	5200	1700	13000
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	970	1100	810	1500
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	970	1100	810	1500
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	0.13	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	0.007	0.010	< 0.001
Barium (filtered)	0.02	mg/L	0.05	0.48	0.48	0.03
Boron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	0.001
Copper (filtered)	0.001	mg/L	0.004	< 0.001	< 0.001	0.002
Iron (filtered)	0.05	mg/L	< 0.05	0.14	0.62	< 0.05
Lead (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001	0.003
Manganese (filtered)	0.005	mg/L	< 0.005	0.30	0.76	0.007
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	0.11	0.018	0.016	0.046
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Zinc (filtered)	0.005	mg/L	0.019	0.020	0.006	0.11
Alkali Metals						
Calcium	0.5	mg/L	96	120	82	110
Magnesium	0.5	mg/L	140	190	84	520
Potassium	0.5	mg/L	11	26	15	17
Sodium	0.5	mg/L	770	1700	510	4500

Client Sample ID			**SW01**	**SW02**	**SW03**	**RINSATE**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S25-No0006369**	**S25-No0006370**	**S25-No0006371**	**S25-No0006372**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	109	110	115	109
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chrysene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Fluorene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Naphthalene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Pyrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Total PAH*	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Fluorobiphenyl (surr.)	1	%	88	78	78	85
p-Terphenyl-d14 (surr.)	1	%	117	111	116	107
Ammonia (as N)	0.01	mg/L	0.01	< 0.01	0.02	< 0.01
Chloride	1	mg/L	28	14	240	< 1
Fluoride	0.1	mg/L	0.3	0.2	0.2	< 0.1
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	< 0.05	< 0.05	0.13
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02	0.13
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	8.8	7.8	7.7	6.2

Client Sample ID			**SW01**	**SW02**	**SW03**	**RINSATE**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**S25-No0006369**	**S25-No0006370**	**S25-No0006371**	**S25-No0006372**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit				
Phosphorus reactive (as P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	2	mg/L	2.0	2.2	10	< 2
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	92	86	550	< 10
Oil & Grease (HEM)	10	mg/L	17	17	< 10	-
Total Suspended Solids Dried at 103°C to 105°C	5	mg/L	44	11	8.2	-
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	49	41	84	< 20
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	66	41	84	< 20
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Barium (filtered)	0.02	mg/L	0.07	0.04	0.08	< 0.02
Boron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	0.002	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	0.002	< 0.001
Iron (filtered)	0.05	mg/L	0.11	0.10	< 0.05	< 0.05
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	0.032	0.027	0.35	< 0.005
Mercury (filtered)	0.0001	mg/L	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel (filtered)	0.001	mg/L	< 0.001	0.001	0.004	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Alkali Metals						
Calcium	0.5	mg/L	12	3.1	22	< 0.5
Magnesium	0.5	mg/L	4.8	5.1	25	< 0.5
Potassium	0.5	mg/L	2.7	2.7	5.2	< 0.5
Sodium	0.5	mg/L	15	17	150	< 0.5

Client Sample ID			**QC20251104_01**	**TS**	**TB**
Sample Matrix			**Water**	**Trip Spike (liquid)**	**Trip Blank (liquid)**
Eurofins Sample No.			**S25-No0006373**	**S25-No0006374**	**S25-No0006375**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons					
TRH C6-C9	0.02	mg/L	< 0.02	-	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	-	-
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	-	-
TRH C6-C10	0.02	mg/L	< 0.02	-	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	-	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	-	-

Client Sample ID			**QC20251104_01**	**TS**	**TB**
Sample Matrix			**Water**	**Trip Spike (liquid)**	**Trip Blank (liquid)**
Eurofins Sample No.			**S25-No0006373**	**S25-No0006374**	**S25-No0006375**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons					
TRH >C10-C16 less Naphthalene (F2)*[N01]	0.05	mg/L	< 0.05	-	-
Naphthalene[N02]	0.01	mg/L	< 0.01	-	< 0.01
TRH >C16-C34	0.1	mg/L	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	-	-
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	-	-
BTEX					
Benzene	0.001	mg/L	< 0.001	-	< 0.001
Toluene	0.001	mg/L	< 0.001	-	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	-	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	-	< 0.002
o-Xylene	0.001	mg/L	< 0.001	-	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	-	< 0.003
4-Bromofluorobenzene (surr.)	1	%	109	-	INT
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	78	-	-
p-Terphenyl-d14 (surr.)	1	%	106	-	-
Ammonia (as N)	0.01	mg/L	< 0.01	-	-
Chloride	1	mg/L	240	-	-
Fluoride	0.1	mg/L	0.2	-	-
Nitrate & Nitrite (as N)	0.05	mg/L	< 0.05	-	-
Nitrate (as N)	0.02	mg/L	< 0.02	-	-
Nitrite (as N)	0.02	mg/L	< 0.02	-	-
pH (at 25 °C)	0.1	pH Units	7.6	-	-
Phosphorus reactive (as P)	0.05	mg/L	< 0.05	-	-
Sulphate (as SO4)	2	mg/L	9.9	-	-
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	550	-	-
Oil & Grease (HEM)	10	mg/L	< 10	-	-
Total Suspended Solids Dried at 103°C to 105°C	5	mg/L	20	-	-
TRH C6-C10	1	%	-	61	-

Client Sample ID			**QC20251104_01**	**TS**	**TB**
Sample Matrix			**Water**	**Trip Spike (liquid)**	**Trip Blank (liquid)**
Eurofins Sample No.			**S25-No0006373**	**S25-No0006374**	**S25-No0006375**
Date Sampled			**Nov 04, 2025**	**Nov 04, 2025**	**Nov 04, 2025**
Test/Reference	LOR	Unit			
Alkalinity (speciated)					
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	81	-	-
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	-	-
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	-	-
Total Alkalinity (as CaCO3)	20	mg/L	81	-	-
Heavy Metals					
Aluminium (filtered)	0.05	mg/L	< 0.05	-	-
Arsenic (filtered)	0.001	mg/L	< 0.001	-	-
Barium (filtered)	0.02	mg/L	0.10	-	-
Boron (filtered)	0.05	mg/L	< 0.05	-	-
Cadmium (filtered)	0.0002	mg/L	< 0.0002	-	-
Chromium (filtered)	0.001	mg/L	< 0.001	-	-
Copper (filtered)	0.001	mg/L	< 0.001	-	-
Iron (filtered)	0.05	mg/L	< 0.05	-	-
Lead (filtered)	0.001	mg/L	< 0.001	-	-
Manganese (filtered)	0.005	mg/L	0.43	-	-
Mercury (filtered)	0.0001	mg/L	< 0.0001	-	-
Nickel (filtered)	0.001	mg/L	< 0.001	-	-
Selenium (filtered)	0.001	mg/L	< 0.001	-	-
Zinc (filtered)	0.005	mg/L	< 0.005	-	-
Alkali Metals					
Calcium	0.5	mg/L	21	-	-
Magnesium	0.5	mg/L	25	-	-
Potassium	0.5	mg/L	5.1	-	-
Sodium	0.5	mg/L	130	-	-
Total Recoverable Hydrocarbons					
Naphthalene	1	%	-	96	-
TRH C6-C9	1	%	-	65	-
BTEX					
Benzene	1	%	-	95	-
Ethylbenzene	1	%	-	95	-
m&p-Xylenes	1	%	-	100	-
o-Xylene	1	%	-	100	-
Toluene	1	%	-	97	-
Xylenes - Total	1	%	-	100	-
4-Bromofluorobenzene (surr.)	1	%	-	103	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Nov 06, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 06, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons	Sydney	Nov 05, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Nov 05, 2025	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Nov 06, 2025	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Nov 06, 2025	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
pH (at 25 °C)	Sydney	Nov 06, 2025	6 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Oil & Grease (HEM)	Melbourne	Nov 06, 2025	28 Days
- Method: LTM-INO-4180 Oil and Grease			
Total Suspended Solids Dried at 103°C to 105°C	Sydney	Nov 06, 2025	7 Days
- Method: LTM-INO-4070 Analysis of Suspended Solids in Water by Gravimetry			
Heavy Metals (filtered)	Sydney	Nov 05, 2025	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Metals M8 filtered	Sydney	Nov 05, 2025	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B11C: Na/K/Ca/Mg	Sydney	Nov 06, 2025	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Eurofins Suite B19C: NO3/NO2/NOx/Reactive P/NH3			
Ammonia (as N)	Melbourne	Nov 05, 2025	28 Days
- Method: APHA 4500-NH3 Ammonia Nitrogen by FIA			
- Method: LTM-INO-4450 Determination of Nitrogen Species by Discrete Analyser			
Nitrate & Nitrite (as N)	Melbourne	Nov 06, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Nitrate (as N)	Melbourne	Nov 06, 2025	28 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Nitrite (as N)	Melbourne	Nov 06, 2025	2 Days
- Method: LTM-INO-4450 Nitrogens by Discrete Analyser			
Phosphorus reactive (as P)	Sydney	Nov 06, 2025	28 Days
- Method: E052 Reactive phosphate (as P)			
Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F			
Chloride	Sydney	Nov 06, 2025	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Fluoride	Sydney	Nov 06, 2025	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Sulphate (as SO4)	Sydney	Nov 06, 2025	28 Days
- Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph			
Alkalinity (speciated)	Sydney	Nov 06, 2025	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Sydney	Nov 06, 2025	7 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Nov 4, 2025 5:27 PM
Address:	Level 8, 179 Elizabeth St Sydney NSW 2000	**Report #:**	1287948	**Due:**	Nov 7, 2025
		Phone:	02 8245 0300	**Priority:**	3 Day
		Fax:		**Contact Name:**	John De Martin
Project Name:	706-752 MAMRE ROAD KEMPS CREEK				
Project ID:	70548				

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Aluminium (filtered)	Barium (filtered)	Boron (filtered)	Iron (filtered)	Manganese (filtered)	Oil & Grease (HEM)	pH (at 25 °C)	Selenium (filtered)	Total Suspended Solids Dried at 103°C to 105°C	Polycyclic Aromatic Hydrocarbons	Metals M8 filtered	Eurofins Suite B1	BTEXN and Volatile TRH	Eurofins Suite B19C: NO3/NO2/NOx/Reactive P/NH3	Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	BTEXN and Volatile TRH	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254											X								X				
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**																		
1	MW01	Nov 04, 2025		Water	S25-No0006365	X	X	X	X	X		X	X		X	X	X		X	X		X	X
2	BH101	Nov 04, 2025		Water	S25-No0006366	X	X	X	X	X		X	X		X	X	X		X	X		X	X
3	BH102	Nov 04, 2025		Water	S25-No0006367	X	X	X	X	X		X	X		X	X	X		X	X		X	X
4	MW02	Nov 04, 2025		Water	S25-No0006368	X	X	X	X	X		X	X		X	X	X		X	X		X	X
5	SW01	Nov 04, 2025		Water	S25-No0006369	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
6	SW02	Nov 04, 2025		Water	S25-No0006370	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
7	SW03	Nov 04, 2025		Water	S25-No0006371	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
8	RINSATE	Nov 04, 2025		Water	S25-No0006372	X	X	X	X	X		X	X		X	X	X		X	X		X	X
9	QC20251104_01	Nov 04, 2025		Water	S25-No0006373	X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X
10	TS	Nov 04, 2025		Trip Spike (liquid)	S25-No0006374																X		
11	TB	Nov 04, 2025		Trip Blank (liquid)	S25-No0006375													X					

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**	
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		Fax:	
Received:	Nov 4, 2025 5:27 PM		
Due:	Nov 7, 2025		
Priority:	3 Day		
Contact Name:	John De Martin		

Project Name: 706-752 MAMRE ROAD KEMPS CREEK
Project ID: 70548

Eurofins Analytical Services Manager : Andrew Black

Sample Detail	Aluminium (filtered)	Barium (filtered)	Boron (filtered)	Iron (filtered)	Manganese (filtered)	Oil & Grease (HEM)	pH (at 25 °C)	Selenium (filtered)	Total Suspended Solids Dried at 103°C to 105°C	Polycyclic Aromatic Hydrocarbons	Metals M8 filtered	Eurofins Suite B1	BTEXN and Volatile TRH	Eurofins Suite B19C: NO3/NO2/NOx/Reactive P/NH3	Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	BTEXN and Volatile TRH	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X								X				
Sydney Laboratory - NATA # 1261 Site # 18217	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X
Test Counts	9	9	9	9	9	4	9	9	4	9	9	9	1	9	9	1	9	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. Unless otherwise stated, all soil/sediment/solid results are reported on a dry weight basis.
3. Unless otherwise stated, all biota/food results are reported on a wet weight basis on the edible portion.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds where annotated.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with **blue** colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the sampling date; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is seven days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
µg/L: micrograms per litre
org/100 mL: Organisms per 100 millilitres
CFU: Colony Forming Unit
mg/L: milligrams per litre
ppb: parts per billion
NTU: Nephelometric Turbidity Units
Colour: Pt-Co Units (CU)
ppm: parts per million
%: Percentage
MPN/100 mL: Most Probable Number of organisms per 100 millilitres

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a similar compound to the analyte target is reported as percentage recovery. See below for acceptance criteria.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however, free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 6.0
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should only be used as a guide and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is ≤30%; however, the following acceptance guidelines are equally applicable:

Results <10 times the LOR:	No Limit
Results between 10-20 times the LOR:	RPD must lie between 0-50%
Results >20 times the LOR:	RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%, VOC recoveries 50 – 150%

PFAS field samples containing surrogate recoveries above the QC limit designated in QSM 6.0, where no positive PFAS results have been reported or reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Chloride	mg/L	< 1			1	Pass	
Fluoride	mg/L	< 0.1			0.1	Pass	
Nitrate & Nitrite (as N)	mg/L	< 0.05			0.05	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Phosphorus reactive (as P)	mg/L	< 0.05			0.05	Pass	
Sulphate (as SO4)	mg/L	< 2			2	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Phosphorus reactive (as P)	mg/L	< 0.05			0.05	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Oil & Grease (HEM)	mg/L	< 10			10	Pass	
Method Blank							
Total Suspended Solids Dried at 103°C to 105°C	mg/L	< 5			5	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Barium (filtered)	mg/L	< 0.02			0.02	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
Ammonia (as N)	%	103			70-130	Pass	
Chloride	%	105			70-130	Pass	
Fluoride	%	105			70-130	Pass	
Nitrate & Nitrite (as N)	%	101			70-130	Pass	
Nitrate (as N)	%	101			70-130	Pass	
Nitrite (as N)	%	93			70-130	Pass	
Phosphorus reactive (as P)	%	91			70-130	Pass	
Sulphate (as SO4)	%	104			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	91			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	97			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	96			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
Naphthalene	%	88			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	112			70-130	Pass	
Toluene	%	114			70-130	Pass	
Ethylbenzene	%	111			70-130	Pass	
m&p-Xylenes	%	112			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total*	%	110			70-130	Pass	
LCS - % Recovery							
Phosphorus reactive (as P)	%	82			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C10-C14	%	94			70-130	Pass	
TRH >C10-C16	%	102			70-130	Pass	
LCS - % Recovery							
Oil & Grease (HEM)	%	107			70-130	Pass	
LCS - % Recovery							
Total Suspended Solids Dried at 103°C to 105°C	%	93			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	97			70-130	Pass	
Acenaphthylene	%	101			70-130	Pass	
Benz(a)anthracene	%	95			70-130	Pass	
Benzo(a)pyrene	%	98			70-130	Pass	
Benzo(b&j)fluoranthene	%	97			70-130	Pass	
Benzo(g.h.i)perylene	%	110			70-130	Pass	
Benzo(k)fluoranthene	%	100			70-130	Pass	
Chrysene	%	100			70-130	Pass	
Dibenz(a.h)anthracene	%	94			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	95			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	103			70-130	Pass	
Pyrene	%	109			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Aluminium (filtered)	%	92			80-120	Pass	
Arsenic (filtered)	%	92			80-120	Pass	
Barium (filtered)	%	90			80-120	Pass	
Boron (filtered)	%	88			80-120	Pass	
Cadmium (filtered)	%	90			80-120	Pass	
Chromium (filtered)	%	95			80-120	Pass	
Copper (filtered)	%	94			80-120	Pass	
Iron (filtered)	%	90			80-120	Pass	
Lead (filtered)	%	94			80-120	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Manganese (filtered)	%	94			80-120	Pass	
Mercury (filtered)	%	94			80-120	Pass	
Nickel (filtered)	%	93			80-120	Pass	
Selenium (filtered)	%	93			80-120	Pass	
Zinc (filtered)	%	92			80-120	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	94			80-120	Pass	
Magnesium	%	98			80-120	Pass	
Potassium	%	96			80-120	Pass	
Sodium	%	98			80-120	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons							
TRH C6-C9	%	96			70-130	Pass	
TRH C6-C10	%	96			70-130	Pass	
Naphthalene	%	89			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	107			70-130	Pass	
Ethylbenzene	%	107			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
o-Xylene	%	106			70-130	Pass	
Xylenes - Total*	%	109			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C6-C9	S25-No0009605	NCP	%	80			70-130	Pass	
TRH C10-C14	S25-No0006579	NCP	%	126			70-130	Pass	
TRH C6-C10	S25-No0009605	NCP	%	75			70-130	Pass	
TRH >C10-C16	W25-No0001455	NCP	%	74			70-130	Pass	
Naphthalene	S25-No0009605	NCP	%	76			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S25-No0009605	NCP	%	99			70-130	Pass	
Toluene	S25-No0009605	NCP	%	99			70-130	Pass	
Ethylbenzene	S25-No0009605	NCP	%	98			70-130	Pass	
m&p-Xylenes	S25-No0009605	NCP	%	101			70-130	Pass	
o-Xylene	S25-No0009605	NCP	%	94			70-130	Pass	
Xylenes - Total*	S25-No0009605	NCP	%	99			70-130	Pass	
Spike - % Recovery									
				Result 1					
Chloride	S25-No0006365	CP	%	100			70-130	Pass	
Fluoride	S25-No0006365	CP	%	105			70-130	Pass	
Nitrate & Nitrite (as N)	S25-No0006043	NCP	%	82			70-130	Pass	
Nitrate (as N)	S25-No0006043	NCP	%	78			70-130	Pass	
Nitrite (as N)	S25-No0006043	NCP	%	91			70-130	Pass	
Sulphate (as SO4)	S25-No0006365	CP	%	114			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	N25-No0004982	NCP	%	89			75-125	Pass	
Magnesium	N25-No0004982	NCP	%	92			75-125	Pass	
Potassium	N25-No0004982	NCP	%	93			75-125	Pass	
Sodium	N25-No0004982	NCP	%	81			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
				Result 1					
Ammonia (as N)	S25-No0006366	CP	%	83			70-130	Pass	
Phosphorus reactive (as P)	S25-No0006366	CP	%	68			70-130	Fail	Q08
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	S25-No0006371	CP	%	101			75-125	Pass	
Arsenic (filtered)	S25-No0006371	CP	%	103			75-125	Pass	
Barium (filtered)	S25-No0006371	CP	%	95			75-125	Pass	
Boron (filtered)	S25-No0006371	CP	%	87			75-125	Pass	
Cadmium (filtered)	S25-No0006371	CP	%	102			75-125	Pass	
Chromium (filtered)	S25-No0006371	CP	%	100			75-125	Pass	
Copper (filtered)	S25-No0006371	CP	%	96			75-125	Pass	
Iron (filtered)	S25-No0006371	CP	%	97			75-125	Pass	
Lead (filtered)	S25-No0006371	CP	%	93			75-125	Pass	
Manganese (filtered)	S25-No0006371	CP	%	64			75-125	Fail	Q08
Mercury (filtered)	S25-No0006371	CP	%	97			75-125	Pass	
Nickel (filtered)	S25-No0006371	CP	%	97			75-125	Pass	
Selenium (filtered)	S25-No0006371	CP	%	101			75-125	Pass	
Zinc (filtered)	S25-No0006371	CP	%	99			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C6-C9	S25-No0006330	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S25-No0013900	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S25-No0013900	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S25-No0013900	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C6-C10	S25-No0006330	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH >C10-C16	S25-No0013900	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Naphthalene	S25-No0006330	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH >C16-C34	S25-No0013900	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S25-No0013900	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S25-No0006330	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S25-No0006330	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S25-No0006330	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S25-No0006330	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S25-No0006330	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S25-No0006330	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Indeno(1.2.3-cd)pyrene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S25-No0006365	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	S25-No0006365	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Chloride	S25-No0006365	CP	mg/L	1000	1000	<1	30%	Pass	
Fluoride	S25-No0006365	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass	
Nitrate & Nitrite (as N)	M25-No0008369	NCP	mg/L	0.35	0.38	8.0	30%	Pass	
Nitrate (as N)	M25-No0008369	NCP	mg/L	0.32	0.35	9.0	30%	Pass	
Nitrite (as N)	M25-No0008369	NCP	mg/L	0.03	0.03	2.0	30%	Pass	
Phosphorus reactive (as P)	S25-No0006365	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Sulphate (as SO4)	S25-No0006365	CP	mg/L	110	110	1.0	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	S25-No0006365	CP	mg/L	2600	2600	1.0	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	S25-No0005901	NCP	mg/L	190	210	8.0	30%	Pass	
Magnesium	S25-No0005901	NCP	mg/L	410	440	7.0	30%	Pass	
Potassium	S25-No0005901	NCP	mg/L	39	43	11	30%	Pass	
Sodium	S25-No0005901	NCP	mg/L	3300	3600	9.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	S25-No0006367	CP	mg/L	0.13	< 0.05	120	30%	Fail	Q15
Arsenic (filtered)	S25-No0006367	CP	mg/L	0.010	0.010	<1	30%	Pass	
Barium (filtered)	S25-No0006367	CP	mg/L	0.48	0.47	1.0	30%	Pass	
Boron (filtered)	S25-No0006367	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Cadmium (filtered)	S25-No0006367	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S25-No0006367	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S25-No0006367	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron (filtered)	S25-No0006367	CP	mg/L	0.62	0.55	12	30%	Pass	
Lead (filtered)	S25-No0006367	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	S25-No0006367	CP	mg/L	0.76	0.76	<1	30%	Pass	
Mercury (filtered)	S25-No0006367	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S25-No0006367	CP	mg/L	0.016	0.016	5.0	30%	Pass	
Selenium (filtered)	S25-No0006367	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S25-No0006367	CP	mg/L	0.006	< 0.005	190	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Oil & Grease (HEM)	M25-No0011969	NCP	mg/L	53	49	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Total Suspended Solids Dried at 103°C to 105°C	S25-No0006370	CP	mg/L	11	12	12	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Phosphorus reactive (as P)	S25-No0006371	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	S25-No0006372	CP	mg/L	< 1	< 1	<1	30%	Pass	
Fluoride	S25-No0006372	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Sulphate (as SO4)	S25-No0006372	CP	mg/L	< 2	< 2	<1	30%	Pass	

Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Bicarbonate Alkalinity (as CaCO3)	S25-No0006372	CP	mg/L	< 20	< 20	<1	30%	Pass	
Carbonate Alkalinity (as CaCO3)	S25-No0006372	CP	mg/L	< 20	< 20	<1	30%	Pass	
Hydroxide Alkalinity (as CaCO3)	S25-No0006372	CP	mg/L	< 20	< 20	<1	30%	Pass	
Total Alkalinity (as CaCO3)	S25-No0006372	CP	mg/L	< 20	< 20	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	S25-No0006372	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Barium (filtered)	S25-No0006372	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Boron (filtered)	S25-No0006372	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Cadmium (filtered)	S25-No0006372	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron (filtered)	S25-No0006372	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Manganese (filtered)	S25-No0006372	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury (filtered)	S25-No0006372	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium (filtered)	S25-No0006372	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S25-No0006372	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R16	The LORs have been raised due to the high concentration of one or more analytes

Authorised by:

Nileshni Goundar	Analytical Services Manager
Dilani Samarakoon	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Inorganic
Mickael Ros	Senior Analyst-Metal
Raymond Siu	Senior Analyst-Volatile
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic

Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Chain of custody

JBS&G

PROJECT NO (Esdat Ref.): 70548	LAB: ALS.	LABORATORY BATCH NO.:
PROJECT NAME: 706-752 Mamre Road, Kemps Creek	SAMPLERS: Skye Tranfa and Alicia Carruthers	
DATE NEEDED BY: 3 day TAT	QC LEVEL: NEPM (2013)	

PHONE: Sydney 02 8245 0300 | Perth 08 9380 3100 | Brisbane 07 3211 5350 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113 | Hobart 03 6208 3700

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PROJECT MANAGER NAME TO APPEAR ON INVOICES: John De Martin…………………………………………… | **SEND INVOICES TO: invoices@jbsg.com.au**

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	pH	TDS	Major Cations and anions (sodium, potassium, calcium, magnesium, chloride, sulfate, alkalinity (speciated))	Metals (Al, As, Ba, B, Cd, Cr, Cu, F, Hg, Ni, Pb, Se, Fe, Mn, Zn)	Fluoride	Nutrients (nitrate, nitrite, ammonia, orthophosphate)	PAHs	TRHs/TPHs	BTEX	TSS	Oil and grease		NOTES:
QC20251104_01	Water	4/11/25		2x organics, 2x metals (filtered), 1x iron (filtered), 1x preserved inorganics, 2x vials, 1x 1L amber, 2x oil and grease		X	X	X	X	X	X	X	X	X	X	X		

TAT

4HT

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Skye Tranfa DATE: 4/11/25 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: DATE: 4/11/25 1700 OF: ALS	COOLER SEAL – Yes……. No …….. Intact ………. Broken ………… COOLER TEMP ……. deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes……. No …….. Intact ………. Broken ………… COOLER TEMP ……. deg C

Environmental Division
Sydney
Work Order Reference
ES2534602

Telephone : + 61-2-8784 8555

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vi… …rsvd; ST = Sterile Bottle; O = Other

QUALITY CONTROL REPORT

Work Order	: **ES2534602**	Page	: 1 of 10
Client	: **JBS&G AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOHN DE MARTIN	Contact	: Jason Dighton
Address	: Level 8 179 ELIZABETH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 70548	Date Samples Received	: 04-Nov-2025
Order number	: 70548	Date Analysis Commenced	: 05-Nov-2025
C-O-C number	: ----	Issue Date	: 10-Nov-2025
Sampler	: ALICIA CARRUTHERS, SKYE TRANFA		
Site	: ----		
Quote number	: EN/000 Custom Quote		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
\# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA005P: pH by PC Titrator (QC Lot: 6987324)									
ED2501488-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.84	7.89	0.6	0% - 20%
ES2534459-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.24	7.28	0.6	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6986228)									
EN2518752-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	5890	5960	1.2	0% - 20%
ES2534480-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	2120	1970	7.5	0% - 20%
ES2534754-002	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	48	42	12.9	No Limit
ES2534761-003	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	231	244	5.7	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 6986227)									
EN2518752-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	16	14	16.9	No Limit
ES2534480-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	1820	1730	4.8	0% - 20%
ES2534754-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ES2534761-003	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.0	No Limit
ED037P: Alkalinity by PC Titrator (QC Lot: 6987325)									
ED2501492-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	199	199	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	199	199	0.0	0% - 20%
ED2501488-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1510	1500	0.3	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 6987325) - continued									
ED2501488-004	Anonymous	ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1510	1500	0.3	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6982605)									
ES2534611-007	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	51	56	9.4	0% - 20%
ES2534489-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	10	0.0	0% - 50%
ED045G: Chloride by Discrete Analyser (QC Lot: 6982606)									
ES2534611-007	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	35	34	0.0	0% - 20%
ES2534489-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	13	13	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 6982482)									
EN2518752-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	535	540	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	436	441	1.2	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	577	583	1.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	44	45	0.0	0% - 20%
EW2505535-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	1	1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	11	11	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6982484)									
ES2534753-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.007	0.007	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.005	0.005	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.04	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05 (0.01)*	mg/L	0.05	0.06	0.0	No Limit
EN2518752-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0001	0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.004	0.004	0.0	No Limit
		EG020A-F: Barium	7440-39-3	0.001	mg/L	0.026	0.026	0.0	0% - 20%
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.003	0.003	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	2.86	2.89	0.9	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Laboratory Duplicate (DUP) Report* *LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6982484) - continued									
EN2518752-001	Anonymous	EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.152	0.156	2.4	0% - 20%
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.043	0.044	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.010	<0.010	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	1.15	1.06	7.8	0% - 20%
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.0	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 6982483)									
ES2534602-001	QC20251104_01	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 6987326)									
ED2501499-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.6	0.8	26.0	No Limit
ME2501597-001	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.0	1.0	0.0	0% - 50%
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 6983184)									
ES2534602-001	QC20251104_01	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	0.01	0.0	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 6982603)									
ES2534611-007	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.01	0.0	No Limit
ES2534489-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 6983183)									
ES2534489-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.04	0.0	No Limit
EW2505503-004	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.09	0.0	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 6982604)									
ES2534489-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6980616)									
ES2534245-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2534245-010	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6980616)									
ES2534245-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2534245-010	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 6980616)									
ES2534245-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2534245-010	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 6980616) - continued									
ES2534245-010	Anonymous	EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 6987324)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.2	98.8	101
				----	7 pH Unit	100	99.2	101
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6986228)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	98.6	87.0	109
				<10	293 mg/L	102	75.2	126
				<10	2420 mg/L	95.0	83.0	124
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 6986227)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	101	83.0	129
				<5	1000 mg/L	95.6	82.0	110
				<5	816 mg/L	107	83.0	118
ED037P: Alkalinity by PC Titrator (QCLot: 6987325)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	100	81.0	115
				----	50 mg/L	102	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6982605)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	108	82.0	122
				<1	500 mg/L	92.4	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6982606)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	103	80.9	127
				<1	1000 mg/L	88.1	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6982482)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	95.7	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	105	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6982484)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	96.2	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	85.0	114
EG020A-F: Barium	7440-39-3	0.001	mg/L	<0.001	0.1 mg/L	99.3	82.0	110
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	92.7	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	96.0	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.3	81.0	111

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6982484) - continued								
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.4	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	95.1	82.0	110
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	95.9	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.010	0.1 mg/L	100.0	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	98.5	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	98.7	82.0	112
EG035F: Dissolved Mercury by FIMS (QCLot: 6982483)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	94.8	83.0	105
EK040P: Fluoride by PC Titrator (QCLot: 6987326)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	95.0	82.0	116
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6983184)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	1 mg/L	107	90.0	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6982603)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.6	82.0	114
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6983183)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	97.8	91.0	113
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6982604)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	98.2	85.0	117
EP020: Oil and Grease (O&G) (QCLot: 6985318)								
EP020: Oil & Grease	----	5	mg/L	<5	5000 mg/L	99.5	81.0	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6980710)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	68.3	50.0	94.0
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	69.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	67.8	62.2	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	72.8	63.9	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	69.2	62.6	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	74.0	64.3	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	68.1	63.6	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	72.2	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	70.8	64.1	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	66.7	62.5	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	66.0	61.7	119

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	*CAS Number*	*LOR*	*Unit*	*Result*	*Concentration*	*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 6980710) - continued								
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	76.3	63.0	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	67.9	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	66.8	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	68.2	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	71.9	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6980616)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	93.0	75.0	127
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6980709)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	400 µg/L	62.0	53.7	97.0
EP071: C15 - C28 Fraction	----	100	µg/L	<100	600 µg/L	70.9	63.3	107
EP071: C29 - C36 Fraction	----	50	µg/L	<50	400 µg/L	63.8	58.3	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6980616)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	94.6	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6980709)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	500 µg/L	58.8	53.9	95.5
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	700 µg/L	71.1	57.8	110
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	300 µg/L	79.7	50.5	115
EP080: BTEXN (QCLot: 6980616)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	99.2	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	107	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	106	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	112	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	107	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	106	75.5	124

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6982605)							
ES2534489-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	120	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	*SpikeRecovery(%)*	*Acceptable Limits (%)*	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED045G: Chloride by Discrete Analyser (QCLot: 6982606)							
ES2534489-001	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	110	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6982484)							
ES2534074-001	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	103	70.0	130
		EG020A-F: Barium	7440-39-3	1 mg/L	82.9	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	91.6	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	73.2	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	90.3	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	84.2	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	88.8	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	90.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	88.8	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 6982483)							
EN2518752-001	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	82.1	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 6987326)							
ED2501499-002	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	87.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 6983184)							
ES2534602-001	QC20251104_01	EK055G: Ammonia as N	7664-41-7	1 mg/L	95.1	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 6982603)							
ES2534489-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.5 mg/L	87.5	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 6983183)							
ES2534489-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.5 mg/L	108	70.0	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 6982604)							
ES2534489-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.5 mg/L	105	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6980616)							
ES2534245-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	103	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6980616)							
ES2534245-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	102	70.0	130
EP080: BTEXN (QCLot: 6980616)							
ES2534245-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	95.3	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	105	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	107	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	111	70.0	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	107	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	101	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2534602**	Page	: 1 of 8
Client	: **JBS&G AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOHN DE MARTIN	Telephone	: +61-2-8784 8555
Project	: 70548	Date Samples Received	: 04-Nov-2025
Site	: ----	Issue Date	: 10-Nov-2025
Sampler	: ALICIA CARRUTHERS, SKYE TRANFA	No. of samples received	: 1
Order number	: 70548	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)	*Date extracted*	*Due for extraction*	***Days overdue***	*Date analysed*	*Due for analysis*	***Days overdue***
EA005P: pH by PC Titrator						
Clear Plastic Bottle - Natural QC20251104_01	----	----	----	07-Nov-2025	04-Nov-2025	**3**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type		Count		Rate (%)		Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)						
Oil and Grease	EP020	1	18	5.56	8.00	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)						
Oil and Grease	EP020	1	18	5.56	6.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)						
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: ✗ = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container */ Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) QC20251104_01	**04-Nov-2025**	**----**	----	----	**07-Nov-2025**	04-Nov-2025	✗
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H) QC20251104_01	**04-Nov-2025**	**----**	----	----	**07-Nov-2025**	11-Nov-2025	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H) QC20251104_01	**04-Nov-2025**	**----**	----	----	**07-Nov-2025**	11-Nov-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container*** */ Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) QC20251104_01	**04-Nov-2025**	**----**	----	----	**07-Nov-2025**	18-Nov-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	03-May-2026	✓
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) QC20251104_01	**04-Nov-2025**	**----**	----	----	**10-Nov-2025**	02-Dec-2025	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) QC20251104_01	**04-Nov-2025**	**----**	----	----	**07-Nov-2025**	02-Dec-2025	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	06-Nov-2025	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	06-Nov-2025	✓
EP020: Oil and Grease (O&G)							
Amber Jar - Sulfuric Acid or Sodium Bisulfate (EP020) QC20251104_01	**04-Nov-2025**	**----**	----	----	**06-Nov-2025**	02-Dec-2025	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) QC20251104_01	**04-Nov-2025**	**06-Nov-2025**	11-Nov-2025	✓	**07-Nov-2025**	16-Dec-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method ***Container** / Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) QC20251104_01	**04-Nov-2025**	**06-Nov-2025**	11-Nov-2025	✓	**07-Nov-2025**	16-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC20251104_01	**04-Nov-2025**	**05-Nov-2025**	18-Nov-2025	✓	**06-Nov-2025**	18-Nov-2025	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber Glass Bottle - Unpreserved (EP071) QC20251104_01	**04-Nov-2025**	**06-Nov-2025**	11-Nov-2025	✓	**07-Nov-2025**	16-Dec-2025	✓
Amber VOC Vial - Sulfuric Acid (EP080) QC20251104_01	**04-Nov-2025**	**05-Nov-2025**	18-Nov-2025	✓	**06-Nov-2025**	18-Nov-2025	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080) QC20251104_01	**04-Nov-2025**	**05-Nov-2025**	18-Nov-2025	✓	**06-Nov-2025**	18-Nov-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	**0.00**	**10.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	18	**5.56**	**8.00**	✗	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by Auto Titrator	EA005-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	5	39	**12.82**	**12.50**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: ✗ = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Oil and Grease	EP020	1	18	**5.56**	**6.00**	✗	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Suspended Solids (High Level)	EA025H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by Auto Titrator	EK040P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	4	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	6	**0.00**	**5.00**	✗	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
pH by Auto Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of \`filterable\` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of \`non-filterable\` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. Auto Titrator) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Fluoride by Auto Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with othophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)
Oil and Grease	EP020	WATER	In house: Referenced to APHA 5520 B. Oil & grease is a gravimetric procedure to determine the amount of dissolved or emulsified oil & grease residue in an aqueous sample. The sample is serially extracted three times n-hexane. The resultant extracts are combined, dehydrated and concentrated prior to gravimetric determination. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015 The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270 Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260 Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM Schedule B(3)

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for purging.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2534602**	Page	: 1 of 7
Client	: **JBS&G AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOHN DE MARTIN	Contact	: Jason Dighton
Address	: Level 8 179 ELIZABETH STREET SYDNEY NSW, AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 70548	Date Samples Received	: 04-Nov-2025 17:40
Order number	: 70548	Date Analysis Commenced	: 05-Nov-2025
C-O-C number	: ----	Issue Date	: 10-Nov-2025 16:55
Sampler	: ALICIA CARRUTHERS, SKYE TRANFA		
Site	: ----		
Quote number	: EN/000 Custom Quote		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC20251104_01**	----	----	----	----
			Sampling date / time	04-Nov-2025 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2534602-001**	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.67**	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	**486**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**18**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**93**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**93**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**14**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**257**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**22**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**26**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**132**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**5**	----	----	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.01**	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	----	----	----	----
Barium	7440-39-3	0.001	mg/L	**0.101**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	----	----	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC20251104_01**	----	----	----	----
			Sampling date / time	04-Nov-2025 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2534602-001**	--------	--------	--------	--------
				Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued								
Manganese	7439-96-5	0.001	mg/L	**0.440**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	----	----	----	----
Selenium	7782-49-2	0.010	mg/L	<0.010	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	----	----	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	----	----	----	----
Iron	7439-89-6	0.05	mg/L	<0.05	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	**0.2**	----	----	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.01**	----	----	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	----	----	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.01**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.01**	----	----	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	----	----	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**9.40**	----	----	----	----
ø Total Cations	----	0.01	meq/L	**9.11**	----	----	----	----
ø Ionic Balance	----	0.01	%	**1.58**	----	----	----	----
EP020: Oil and Grease (O&G)								
Oil & Grease	----	5	mg/L	<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC20251104_01**	----	----	----	----
			Sampling date / time	04-Nov-2025 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2534602-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L	<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L	<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L	<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L	<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L	<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L	<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	µg/L	<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L	<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L	<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L	<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L	<20	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Sample ID*	**QC20251104_01**	----	----	----	----
			Sampling date / time	04-Nov-2025 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES2534602-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued								
>C10 - C16 Fraction	----	100	µg/L	<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L	<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L	<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L	<100	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	----	----	----	----
Toluene	108-88-3	2	µg/L	<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L	<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L	<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L	<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L	<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L	<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1.0	%	**24.2**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%	**49.9**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%	**40.8**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1.0	%	**66.7**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%	**92.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%	**72.1**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	**91.7**	----	----	----	----
Toluene-D8	2037-26-5	2	%	**108**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	**111**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	*CAS Number*	***Recovery Limits (%)*** Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Attachment H QA/QC Results

The QA/QC results for all samples collected at the site are summarised in **Table G1** and discussed below, while the laboratory reports are presented in **Attachment F**.

Table G1 – Data Quality Indicator Assessment

Data Quality Objectives	Result	DQO Met?
Precision		
Groundwater Duplicates (intra laboratory)	1/7 Samples, 0 – 120% RPD Intra laboratory samples were analysed at a rate greater than 1 in 10 samples.	Partial[1]
Groundwater Triplicates (inter laboratory)	1/7 Samples, 0 – 120% RPD Inter laboratory samples were analysed at a rate greater than 1 in 10 samples.	Partial[1]
Laboratory Duplicates	0-120% RPD , >1/10 Samples	Partial[1]
Accuracy		
Surrogate spikes	24.2 – INT % recovery	Partial[1]
Laboratory control samples	58.8 – 114% recovery	Yes
Matrix spikes	64 – 126% recovery	Partial[1]
Representativeness		
Samples extracted and analysed within holding times.	All primary and duplicate samples were extracted within 14 days of sampling.	Yes
Trip spike	61 – 100 % recovery	Partial[1]
Trip blank	<LOR	Yes
Rinsate/s	<LOR – 0.13	Partial[1]
Standard operating procedures for sample collection & handling	Field scientist used the same standard operating procedures throughout works.	Yes
Comparability		
Standard analytical methods used for all analyses	Standard analytical methods used	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by the same field scientist. Standard operating procedures were conducted throughout the works. Field conditions remained the same throughout the works. The primary and secondary labs remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Water limits of reporting were consistent and appropriate.	Yes
Completeness		
Field notes and COCs completed and appropriate	All field notes and COCs were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation is included in the Appendices.	Yes
Satisfactory frequency and result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes

Data Quality Objectives	Result	DQO Met?
Data from critical samples	Samples were analysed from the required monitoring locations.	Yes
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Analytical methods and limits of recovery were considered appropriate for media and adopted assessment criteria.	Yes

1. See discussion below for notes.

QA/QC Discussion

Precision

Duplicates (intra-laboratory) and Triplicate (inter-laboratory)

Water blind and split duplicates were collected at a rate of greater than 1 per 20 primary samples analysed and all resultant RPDs were reported to be within the JBS&G acceptable limit (0-50 %) with the exception of copper, nickel, ammonia and TSS in which the RPDs ranged from 67-120 %. The elevated RPD is considered to be a result of the reported concentrations been close to the laboratory LOR and is considered not to affect the outcomes of the assessment.

Laboratory Duplicates

A sufficient number of laboratory duplicates were analysed in which RPDs were generally within the JBS&G acceptable limit of <50 %. Where lab duplicate RPDs were above 50 %, the reported RPD passed the laboratory internal QC acceptance criteria or was a result of the heterogeneity of the material and is therefore not considered to affect the precision of the dataset.

Accuracy

Surrogate Spikes

Surrogate spike analysis results were presented for all organic contaminant sample analysis results. Some surrogate spike recoveries were reported outside the acceptable range of 70-130 %. These outliers generally fell within the NATA acceptable limits of 50-150 % and are therefore considered to not impact the overall accuracy of the dataset. In addition, some surrogate spikes were not reported due to sample matrix interference (INT).

Elevated surrogate recoveries indicate the reported concentrations may potentially be greater than the actual concentrations, while low surrogate recoveries indicate the reported concentrations may potentially be less than the actual concentrations. Taking this into account it is considered that samples with slightly elevated or lower surrogate recoveries (or reported interferences) do not affect the reliability of the data for this investigation.

Laboratory Control Samples

A sufficient number of laboratory control samples were analysed in which recoveries were generally within the preferred range (70-130 %). Where laboratory control samples were outside the preferred range, the recoveries were within the laboratory acceptable limits (typically between 50 and 150 % recovery) under the laboratory's NATA accreditation.

Matrix Spikes

A sufficient number of matrix spikes were analysed within the soil samples and generally all recoveries were reported within the JBS&G acceptable range (70-130 %). A small number of matrix spike recoveries were reported outside the JBS&G acceptable range but were within the laboratory acceptable limits (typically between 50 and 150 % recovery) under the laboratory's NATA accreditation. In addition, the laboratory notes the matrix spike recoveries outside of the recommended acceptance criteria for manganese and phosphorus reactive, an acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Representativeness

Sampling appropriate for media and analytes

All sampling works completed during the investigation were conducted in accordance with JBS&G standard operating procedures as detailed in **Section 2.1.**

Holding Times

The extraction and analysis of selected samples was completed within the recommended holding times for all analytes.

Rinsate Blank

A field rinsate blank was submitted with the water samples submitted to the laboratory. There were generally no reported concentrations of COPCs above the laboratory LOR, with the exception of Nitrate (as N) in the rinsate sample in the groundwater lab batch 1287948, reported at a concentration of 0.13 mg/L.

Despite the adherence to strict decontamination procedures, it is unclear as to whether this result is representative of cross contamination, are laboratory artefacts in the deionised water, or a laboratory issue. Given there were no detections above the adopted site criteria of nitrate within water samples, even if the rinsate sample result is indicative of cross contamination during sampling, accounting for this result in review of the laboratory analysis results would not result in a change to any of the final decisions required to be made for this assessment. As such, these results are considered to not affect the representativeness of the dataset.

Trip Spike

All trip spike recoveries were found to be generally acceptable indicating a low potential for the loss of volatile constituents during handling and transport of samples, with the exception of two TRH (C6-C10) and TRH (C6-C9) trip spike results in laboratory batch 1287948. With consideration to these results being reported 5-9% outside the adopted acceptance range, as well as the remainder of laboratory trip spike results reporting within the adopted range, it has been considered that the reported trip spike outside the acceptable ranges are not considered to affect the accuracy of the dataset.

Trip Blank

There were no reported concentrations of BTEX or other volatile contaminant compounds above the laboratory LOR, indicating a low potential for cross contamination of samples by volatile compounds.

Decontamination and Calibration

All field equipment was decontaminated appropriately as per the procedure identified in **Section 2.1**

Comparability

An experienced JBS&G field scientist undertook all sampling in accordance with standard JBS&G sampling methods.

All field documentation was appropriately completed. The nominated laboratories undertook all analysis in accordance with the relevant National Association of Testing Authorities (NATA) accredited methods.

Completeness

Samples were transported under full chain of custody (COC) documentation. The COC documentation was completed correctly, and the selected analyses were correctly conducted.

The frequency of analysis and result for all QC samples were appropriate.

Sensitivity

Laboratory analysis methods for all contaminants in groundwater adopted during the investigation generally used limits of reporting significantly less than the site assessment criteria to ensure the contaminant concentrations could be confidently identified as being less than the adopted groundwater assessment criteria.

RPD ANALYTICAL SUMMARY TABLE

Project Number: 70548

Project Name: Mamre Road Kemps Creek, Plan Project Management

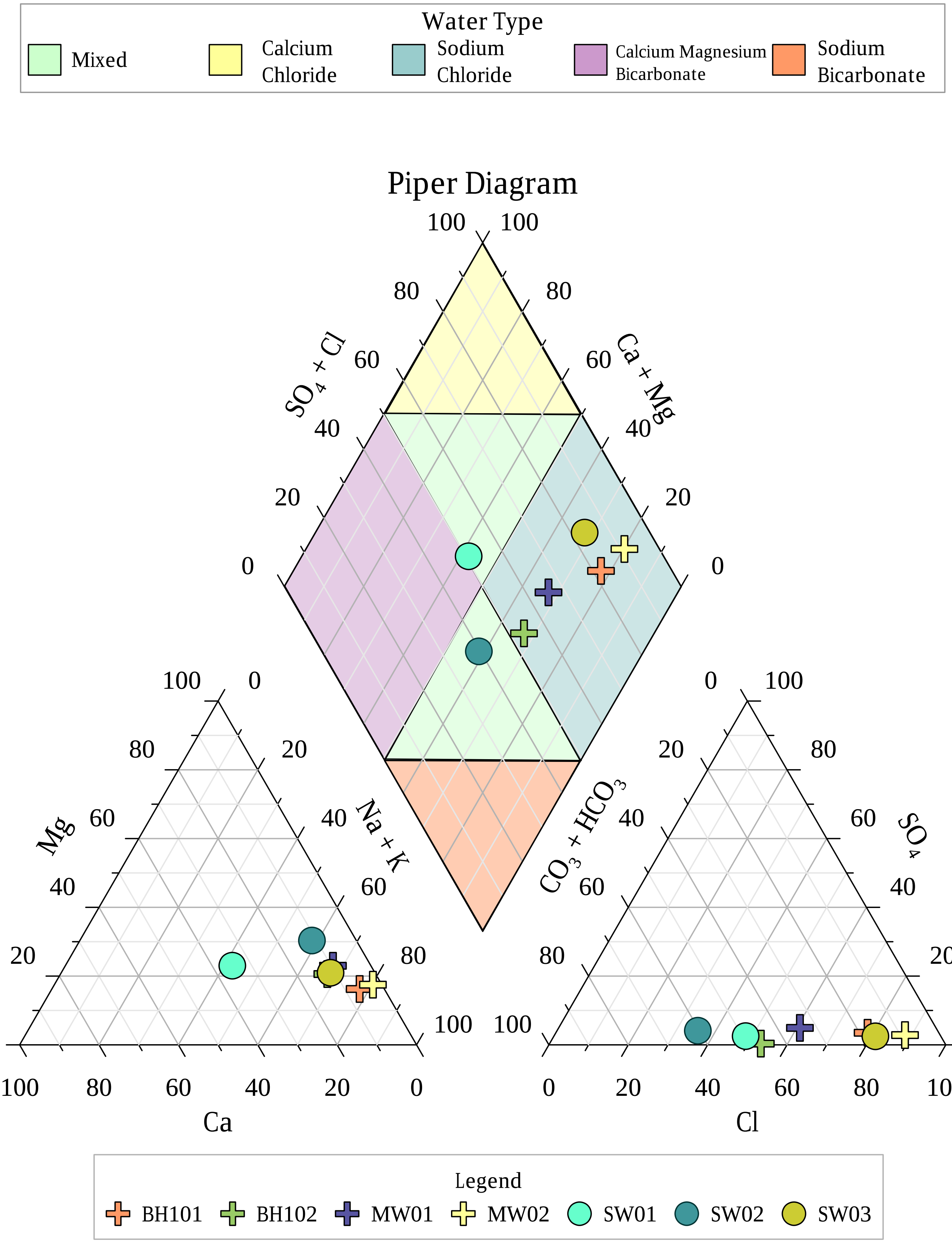
Lab Report Number			1287948	1287948		1287948	ES2534602	
Field ID			SW03	QC20251104_01		SW03	QC20251104_01	
Matrix Type			Water	Water		Water	Water	
Date			04 Nov 2025	04 Nov 2025	RPD	04 Nov 2025	04 Nov 2025	RPD
	Unit	EQL						
Metals & Metalloids								
Aluminium (filtered)	mg/L	0.01	<0.05	<0.05	0	<0.05	0.01	0
Arsenic (filtered)	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Barium (filtered)	mg/L	0.001	0.08	0.10	22	0.08	0.101	23
Boron (filtered)	mg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Cadmium (filtered)	mg/L	0.0001	<0.0002	<0.0002	0	<0.0002	<0.0001	0
Chromium (III+VI) (filtered)	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Copper (filtered)	mg/L	0.001	0.002	<0.001	67	0.002	<0.001	67
Iron (filtered)	mg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Lead (filtered)	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Manganese (filtered)	mg/L	0.001	0.35	0.43	21	0.35	0.440	23
Mercury (filtered)	mg/L	0.0001	<0.0001	<0.0001	0	<0.0001	<0.0001	0
Nickel (filtered)	mg/L	0.001	0.004	<0.001	120	0.004	<0.001	120
Selenium (filtered)	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.010	0
Zinc (filtered)	mg/L	0.005	<0.005	<0.005	0	<0.005	<0.005	0
TPH								
Oil and Grease	mg/L	5	<10	<10	0	<10	<5	0
TPHs (NEPC 1999)								
C6-C9 Fraction	mg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
C10-C14 Fraction	mg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
C15-C28 Fraction	mg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
C29-C36 Fraction	mg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0
C10-C36 Fraction (Sum of Total)	mg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0
TRHs (NEPC 2013)								
C6-C10	mg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
C10-C16	mg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
C16-C34	mg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
C34-C40	mg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
C10-C40 (Sum of total)	mg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
F1 (C6-C10 minus BTEX)	mg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
F2 (C10-C16 less Naphthalene)	mg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
BTEXN								
Benzene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Toluene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.002	0
Ethylbenzene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.002	0
Xylene (o)	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.002	0
Xylene (m & p)	mg/L	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Xylene Total	mg/L	0.002	<0.003	<0.003	0	<0.003	<0.002	0
Total BTEX	mg/L	0.001	-	-	-	-	<0.001	-
Naphthalene_VOC	mg/L	0.005	<0.01	<0.01	0	<0.01	<0.005	0
PAH								
Acenaphthene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Acenaphthylene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Anthracene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Benz(a)anthracene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Benzo(a)pyrene	mg/L	0.0005	<0.001	<0.001	0	<0.001	<0.0005	0
Benzo(a)pyrene TEQ calc (Zero)	mg/L	0.0005	-	-	-	-	<0.0005	-
Benzo(b+j)fluoranthene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Benzo(g,h,i)perylene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Benzo(k)fluoranthene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Chrysene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Dibenz(a,h)anthracene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Fluoranthene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Fluorene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Indeno(1,2,3-c,d)pyrene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Naphthalene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Phenanthrene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
Pyrene	mg/L	0.001	<0.001	<0.001	0	<0.001	<0.0010	0
PAHs (Sum of total)	mg/L	0.0005	<0.001	<0.001	0	<0.001	<0.0005	0
Non-Metallic Inorganics								
Phosphorus reactive (as P)	MG/KG	0.01	<0.05	<0.05	0	<0.05	-	-
Phosphorus reactive (as P) (filtered)	MG/KG	0.01	-	-	-	-	<0.01	-
Ammonia as N	mg/L	0.01	0.02	<0.01	67	0.02	0.01	67
Fluoride	mg/L	0.1	0.2	0.2	0	0.2	0.2	0
Nitrate (as N)	mg/L	0.01	<0.02	<0.02	0	<0.02	0.01	0
Nitrite (as N)	mg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0
Nitrite + Nitrate as N	mg/L	0.01	<0.05	<0.05	0	<0.05	0.01	0
Major Cations								
Calcium	mg/L	0.5	22	21	5	22	-	-
Calcium (filtered)	mg/L	0.5	-	-	-	-	22	-
Potassium	mg/L	0.5	5.2	5.1	2	5.2	-	-
Potassium (filtered)	mg/L	0.5	-	-	-	-	5	-
Magnesium	mg/L	0.5	25	25	0	25	-	-
Magnesium (filtered)	mg/L	0.5	-	-	-	-	26	-
Sodium	mg/L	0.5	150	130	14	150	-	-
Sodium (filtered)	mg/L	0.5	-	-	-	-	132	-
Major Anions								
Alkalinity (Carbonate as CaCO3)	mg/L	1	<20	<20	0	<20	<1	0
Alkalinity (Hydroxide) as CaCO3	mg/L	1	<20	<20	0	<20	<1	0
Alkalinity (total) as CaCO3	mg/L	1	84	81	4	84	93	10
Sulphate as SO4 - Turbidimetric (filtered)	mg/L	1	-	-	-	-	14	-
Alkalinity (Bicarbonate as CaCO3)	mg/L	1	84	81	4	84	93	10
Chloride	mg/L	1	240	240	0	240	257	7
Sulphate	mg/L	2	10	9.9	1	10	-	-
Ionic Balance								
Ionic Balance	%	0.01	-	-	-	-	1.58	-
pH (Lab)	pH Units	0.01	7.7	7.6	1	7.7	7.67	0
Cations Total	meq/L	0.01	-	-	-	-	9.11	-
Anions Total	meq/L	0.01	-	-	-	-	9.40	-
Other								
TDS	mg/L	10	550	550	0	550	486	12
TSS	mg/L	5	8.2	20	84	8.2	18	75

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 30 (1 - 10 x EQL); 30 (10 - 30 x EQL); 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**

Attachment I Piper Plot of Groundwater and Surface Water


Water Type
🟩 Mixed
🟨 Calcium Chloride
🟦 Sodium Chloride
🟪 Calcium Magnesium Bicarbonate
🟧 Sodium Bicarbonate
Piper Diagram
SO$_4$ + Cl
Ca + Mg
Mg
Na + K
CO$_3$ + HCO$_3$
SO$_4$
Ca
Cl
0
20
40
60
80
100
Legend
BH101
BH102
MW01
MW02
SW01
SW02
SW03

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A	Electronic	Plan Project Management	19/11/2025
0	Electronic	Plan Project Management	26/11/2025

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Jason Carr	John De Martin	John De Martin	-	19/11/2025
0	Jason Carr	John De Martin	John De Martin	-	26/11/2025

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