BORAL

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September 2026

# Annual Review

## Marulan South Limestone Mine Continued Operations Project
## Boral Cement Limited



## Document Control

Prepared by: Sharon Makin
Boral Marulan South Limestone Mine

| STATUS | DATE | DISTRIBUTION |
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| Draft | 9th October 2026 | Anne-Elisabeth Champon<br>(Boral Marulan South Limestone Mine Manager)<br>Greg Johnson (Senior Environment Business Partner)<br>Sharon Makin (Environment Business Partner) |
| Final | 15th October 2026 | Anne-Elisabeth Champon<br>(Boral Marula South Limestone Mine Manager)<br>Greg Johnson (Senior Environment Business Partner)<br>Sharon Makin (Environment Business Partner) |

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## ANNUAL REVIEW INFORMATION

**Annual Review Authorisation**

| | |
|---|---|
| Name of Operation | Marulan South Limestone Mine |
| Name of Operator | Boral Limited |
| Development Consent No. | SSD 7009 |
| Name of holder of development consents | Boral Cement Limited |
| Mining Lease | ML1857 |
| Name of Holder of Mining Lease | Boral Cement Limited |
| Water Licence | WAL25207, WAL25373, WAL25352, WAL24697, WAL41976 |
| Name of Holder of Water Licence | Boral Cement Limited |
| RMP | Currently under review |
| Annual Review start date | 01 Jul 2025 |
| Annual Review end date | 30 Jun 2026 |

I, Sharon Makin, certify that this audit report is a true and accurate record of the compliance status of the Marulan South Limestone Mine for the period 1 Jul 2025 to 30 June 2026 and that I am authorised to make this statement on behalf of Boral Cement Limited.

*Note.*

a. *The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual $250,000.*

b. *The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/ information/ documents – maximum penalty 2 years imprisonment of $22,000, or both).*

| | |
|---|---|
| Name of authorised reporting officer | Sharon Makin |
| Title of authorising reporting officer | Environmental Business Partner NSW/ACT |
| Signature of authorised reporting officer |  |
| Date | 15th October 2026 |

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# 1. STATEMENT OF COMPLIANCE

This Annual Review (AR) summarises compliance with State Significant Development Approval (SSD) 7009 which was granted by the NSW Department of Planning, Industry and Environment on 19 August 2021. Mining operations commenced under this consent on 1st January 2023. The following Mining Authorisations, Rehabilitation Management Plan and EPL are also applicable to the Marulan South Limestone Mine Continued Operations Project:

- ML1716 (relinquished 17/7/2023);
- CML16 (relinquished 3/12/2024);
- ML1857 (granted 14/7/2023);
- Marulan South Limestone Mine Rehabilitation Management Plan (RMP) 2023-2026;
- EPBC 2015/7521 and
- Environment Protection Licence 944.

This report has been prepared in accordance with the *Post-approval requirements for State significant mining developments Annual Review Guideline* (2015) (the Guideline).

The Statement of Compliance for the 2025 /2026 Reporting Period is contained in Table 1.1.

The Non compliances identified during the reporting period are detailed in Table1.2. Each non-compliance has been risked ranked as per the DPE Annual Review Guidelines Compliance Status key outlined in Table 1.3.

**Table 1.1 – Compliance Summary 2025/2026**

| | |
|---|---|
| SSD 7009 | non-compliances, see Table 1.2 and Section 11 |
| ML1857 | Conditions satisfied |
| RMP 2023-2026 | Conditions satisfied |
| EPBC 2015/7521 | non-compliances, see Table 1.2 and Section 11 |
| EPL 944 | non-compliances, see Table 1.2 refer Section 11 |

Table 1.2 – Non-Compliance

| Approval | Condition | Condition Description | Compliance Status | Comment | Where addressed |
|---|---|---|---|---|---|
| SSD 7009 | A19 | Within 12 months of the date of commencement of development under this consent, or other timeframe agreed by the Planning Secretary, the Applicant must surrender the existing development consents. dated 21 February 1972, 16 October 1974, 13 February 1995 and 22 May 1997, April 2008, 20 June 2006 and 1 March 2012 as detailed in Section 3.3.4 of the EIS, and any existing or continuing use rights for the site, in accordance with the EP&A Regulation. | Non-compliant | Delays have been experienced in surrendering consents associated with Crown Lands.<br>Extension to surrender remaining 6 consents granted by DPHI to the 30th Dec 2026. | Section 11 |
| SSD 7009 | B56 | The Applicant must implement the Biodiversity Management Plan as approved by the Planning Secretary | Non-compliant | It was identified that Boral had failed to undertake the rapid visual assessment of the closed catchment dam area, in accordance with the BMP. | Section 11 |
| SSD 7009 | B88 | Unless otherwise agreed by Council, the Applicant must not dispatch more than 75 laden trucks per day or 5 laden trucks per hour from the site, until Marula South Road is upgraded | Non-compliant | On the 22nd April 2026, 76 truck movements were recorded. | Section 11 |
| EPBC 2015/7521 | Part A C3<br>Part B 9 & 10 | 3. The approval holder must comply with the State development consent conditions A2, A5, B51, B52, B53, B54, B55, B56, B76, B78, B79, B80, B81 and B82.<br>9. The approval holder must notify the Department in writing of any: incident or non-compliance with the conditions. The notification must be given as soon as practicable, and no later than 2 business days after becoming aware of the incident or non-compliance.<br>10. The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance | Non-compliant | A non-compliance was identified with B56 as outlined as above hence triggering a non-compliance with Part A Condition 3 of the EPBC approval. This was advised to Boral in February 2026.<br>Two non-compliances were identified against Part B, Conditions 9 and 10, which require notification and reporting of non-compliances associated with the EPBC approval. During preparation of the EPBC Annual Compliance Report, Boral identified this oversight and recognised that the non-compliance against Part A Condition 3 should also have been reported to DCCEEW. Formal notification has been issued to DCCEEW as of the 1st May 2026. | Section 11 |
| EPL 994 | L3.2 | Point 1 in a 24 hour period the 100 percentile concentration limit for PM10 is 50 micrograms per cubic | Non-compliant | PM10 and PM2.5 samples taken at various times resulted in exceedances of the daily criteria. | Section 11 |

| Approval | Condition | Condition Description | Compliance Status | Comment | Where addressed |
|---|---|---|---|---|---|
| &<br><br>SSD 7009 | | meter, and 25 micrograms per cubic meter for PM2.5.<br><br>The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Table 3 at any residence on privately owned land.<br>(note Table 3 criteria is the same as the EPL) | | 8/1/26 PM2.5 result was 34.85 ug/m3 in 24hrs.<br>27/1/26 PM2.5 result was 38.99 ug/m3 in 24hrs.<br>27/1/26 PM10 result was 56.08 ug/m3 in 24hrs.<br>29/1/26 PM2.5 result was 34.88 ug/m3 in 24hrs.<br>29/1/26 PM10 result was 100.72 ug/m3 in 24hrs.<br>11/4/26 PM2.5 result was 51.85ug/m3 in 24hrs<br>17/4/26 PM2.5 result was 38.1 ug/m3 in 24hrs<br>The other samples over the year were below the criteria.<br>The monitor locations are not representative of the boundary and once interpolated to the boundary, the results are within the criteria. | |

Table 1.3 Compliance Status Key

| Risk Level | Code | Description |
|---|---|---|
| High | Non-compliant | Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence. |
| Medium | Non-compliant | Non-compliance with:<br>• potential for serious environmental consequences, but is unlikely to occur; or<br>• potential for moderate environmental consequences but is likely to occur. |
| Low | Non-compliant | Non-compliance with:<br>• potential for moderate environmental consequences, but is unlikely to occur; or<br>• potential for low environmental consequences but is likely to occur. |
| Administrative non-compliance | Non-compliant | Only to be applied where the non-compliance does not result in any risk of environmental harm (eg submitting a report to government later than required under approval conditions). |

Pre-commencement conditions associated with SSD 7009 were satisfied in the 2022 reporting period allowing commencement of the new approval on 1st January 2023. This Annual Review has therefore been prepared in accordance with Clause D11 of SSD 7009.

# 2. INTRODUCTION

## 2.1. Project Description

Boral's Marulan South Limestone Mine has been operational since the 1860s, consisting of a limestone mine and processing plant (Appendix 1 Figure 1). It is located directly to the north of Bungonia Gorge and approximately 35km east of Goulburn NSW, with lands covering 650 hectares of a significant limestone and granodiorite deposit (Appendix 1 Figure 2). Resources over a total of 616.5 hectares of land are to be extracted under SSD 7009 (Appendix 1 Figure 3).

The mine produces a range of limestone products for the cement and steel industry as well as the construction, agricultural and industrial markets across the state. Limestone is an essential ingredient in cement and steel manufacture while a component is further processed on site to produce Calcium Oxide and Hydrated Lime for various applications such as water purification, mining, asphalt production and soil stabilisation. Crushed Limestone is transported by rail direct to the Boral Cement Works at Berrima, or to BlueScope Steel at Port Kembla. Limestone supplied to the Peppertree Quarry forms a key part of manufactured sand for concrete and Limestone and fine limestone are also widely used in the agricultural industry for neutralising soils and for animal feed. Lime products are distributed typically by road tanker to destinations throughout NSW or by container to Queensland and Victoria. A component of the mine production including clay shale and aggregates is transported directly by truck where rail facilities are not available. Marulan South Limestone Mine operates 24 hours per day, 7 days per week and employs approximately 105 full-time personnel.

Boral received approval for the Marulan South Limestone Mine Continued Operations State Significant Development Application (SSDA) on the 19th August 2021 which came into force on 1st January 2023 with the completion of various pre-conditions including the approval of various management plans for the operation. The approval provides a modern planning consent consistent with current legislative requirements which covers a 30 year mine plan representing 120 Mt of limestone at an extraction rate of 4 Mtpa. Shale will also be extracted at a rate of up to 200,000 tpa. The new mine plan seeks to incorporate rehabilitation and final landform initiatives with overburden emplacements.

The continued operations of the mine will provide an uninterrupted supply of construction materials to local and regional industries and state projects with an optimal use of regionally significant resources. The mining project is expected to provide economic benefits to the local community through the purchase of goods, local expenditure, and continued employment of almost 200 people, both directly and indirectly associated with the mining operations.

This Annual Review has been prepared in accordance with Condition D11 of SSD 7009 and covers the operation over the 2025-2026 period. This review has been structured in accordance with the Department of Planning and Environment guidelines for the preparation of Annual Reviews.

## 2.2. Key Personnel

Details of the management personnel at Marulan South Limestone are provided in Table 2.1 below. Additional specialist advice is provided as required by a range of environmental consultants.

**Table 2.1 –Mine Contacts**

| Role | Name | Contact |
|---|---|---|
| Marulan South Limestone Mine Site manager | Anne-Elisabeth Champon | Ph: 0417 019 358<br>Email: anneelisabeth.champon@boral.com.au |
| Environmental and Stakeholder Advisor | Michelle Grossbach | Ph: (02) 4820 3007<br>Email: michelle.grossbach@boral.com.au |

# 3. APPROVALS

This chapter describes the approval platform for the Marulan South Limestone Mine along with other mining and statutory approvals relevant to the ongoing operation.

## 3.1 Planning Consent

The Marulan South Limestone Mine operates under SSD 7009 which overrides the previous five development consents issued by Goulburn Mulwaree Council. The current approval was the subject of an Environmental Impact Statement and State Significant Development Application covering all existing and future operations for a 30-year period until 31 August 2051. The approval allows for the extraction of up to 4 million tonnes per annum (tpa) of limestone, extraction of up to 200,000 tpa of clay shale and the processing of the lime products (hydrated lime and quick lime) limestone aggregates and sand.

The mine footprint focuses on an expansion of the pit westwards to mine the Middle Limestone, eastwards and deeper to mine into the main Limestone. As the Middle Limestone lies approximately 70-150 m west of the Main Limestone, the 30-year mine plan avoids mining where practical, the interburden between these two limestone units thereby creating a smaller second, north-south oriented west pit with a ridge remaining between. The north pit will also be expanded southwards, encompassing part of the south pit, leaving the remainder of the south pit for overburden emplacement and a visual barrier. The approval allows for accessing approximately 120 Mt of limestone down to a depth of 335m.

## 3.2 EPBC Approval

On 31 July 2015, the proposed expansion of mining operations was referred to the then Department of Agriculture, Water and Environment (DAWE) under the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act).

On 10 September 2015, the Minister for Environment determined the expansion was a controlled action and advised that it would be assessed by the NSW Department of Planning, Industry and Environment (DPIE) as part of the State Significant Development (SSD) process under the Environmental Planning and Assessment Act 1979 in accordance with the terms of the Bilateral Agreement with NSW.

The Variation of Proposal to Take an Action – Marulan South Limestone Mine Extension Project, Marulan South NSW (EPBC 2015/7521) was approved and took effect from 1 October 2024.

## 3.3 Mining Lease 1857

ML1857 was granted on 14th July 2023 for a term of 21 years and covers an area of 688.5 hectares. This ML1857 covers the new mining and associated ancillary activity areas as covered by SSD7009 for the Continued Operations Project that were not already covered by CML16.

### 3.3.1 Rehabilitation Management Plan

A Rehabilitation Management Plan (RMP) was prepared for the mine under the new regulatory framework established by the Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021. The RMP came into effect on the 14th July 2023 and was revised in July 2026 following a Targeted Assessment on Landform Establishment by the Resource Regulator.

## 3.4 Environmental Protection Licence (EPL) 944

Boral Cement Limited holds EPL 944 for the “Marulan South Limestone Mine and Lime Plant”. The EPL allows for between 100,000 and 250,000 tpa of cement or lime production and between 2 and 5 million tpa of minerals production by mining. Commencement of development under of the SSD7009 consent triggered a revision and

variation of the EPL in order to align new consent conditions placed on the operation with those in the EPL. This update occurred in March 2023.

A copy of the Project Approval is available on request or can be accessed under the “statutory approvals- peppertree quarry” tab through the following Boral website:

Boral Cement Marulan South Limestone Mine | Boral

A copy of the EPL (944) is available on request or can be accessed through the following EPA website:

https://www.epa.nsw.gov.au/Licensing-and-Regulation/Public-registers

## 3.5 Other Licences

In addition to SSD7009, the mining leases and EPA licence, the following activities and items are licenced:

**Table 3.1 - Site Licences**

| Description | Licence No | Licence Authority | Renewal |
|---|---|---|---|
| Explosive Licence to Import | 11-100005-004 | Safe Work NSW | Held by Orica |
| Acknowledgement of Notification of Dangerous Goods on Premises | 35/008099 | Safe Work NSW | N/A |
| Revised Apparatus Licence | 1203917<br>1958988 & 1958989<br>9922223 | A.C.M.A. | 21/07/2026<br>23/01/2026<br>22/02/2026 |
| Radiation Management Licence | 5061123 | NSW EPA | 21/08/2026 |
| Refrigerant Trading Authorisation Certificate | AU 04450 | ARC | 10/03/2027 |
| Certificate of Plant Item Registration | MC 6-82896/05/0 | Safe Work NSW | 16/10/2025 |
| Water Access Licences<br><br>Works Approval<br>Licences Reference Number | WAL24697<br>WAL25207<br>WAL25352<br>WAL25373<br>WAL41976<br>10AL116141 (WP16 & 17)<br>10AL102350<br>10AL102376<br>10WA122922<br>10WA124508 (WB07) | NSW Department of Primary Industries Office of Water | Continuing<br><br>3 Dec 2028 |
| Water Supply Works – two bores | 10CA123795 (WB08) | NRAR | 08 Apr 2030 |
| Monitoring Bore Licences | 10BL605442<br>10BL605443<br>10BL605444<br>10BL605445<br>10BL605449 (MW3S & MW3D)<br>10BL605450<br>10BL605944 (MW9)<br>10BL605945 (MW8) | NSW Department of Primary Industries Office of Water | Licence 10AL116141D Perpetuity |
| Surface Water Licence<br>(1 x Overshot Dam & 2 Pumps) | 10WA102352 pump to overshot dam (Shoalhaven River water source) | NSW Department of Primary Industries Office of Water | 30/06/2034 |

| Description | Licence No | Licence Authority | Renewal |
|---|---|---|---|
| | 10AL102350 - WAL 25352 Stock and domestic (1ML Barbers Ck MGMT Zone)<br>10AL102351 - WAL25207 unregulated river (76ML Barbers Ck MGMT Zone) | | |
| Surface Water Licence<br>(1 x 38mm Centrifugal Pump) | 10WA102377<br>10AL102376 WAL 25373 | NSW Department of Primary Industries Office of Water | 25/04/2026 |
| Local Land Services ACT 2013 - Rate Notice | Ref: 110324316 | NSW Government Office of Local Land Services | 1/5/2026 |

# 4. MINE OPERATIONS

This chapter summarises the production and processing operations during the 2024-25 reporting period. Historic production levels are also provided for completeness.

## 4.1 Operations in the last 12 months

Standard operations continued over the last 12 months.

Limestone and overburden are mined using standard drilling and blasting methods. Front-end loaders and excavator are the primary loading tools with a fleet of rigid dump trucks hauling to the primary crusher, stockpile areas and overburden emplacements.

Limestone quality is monitored using drill hole data and online analysers in the plant.

Limestone extraction has continued from the main limestone in North Pit and Centre Ridge as well as from the middle limestone on the Western Batters.

Overburden has been removed from the Eastern and Western Batters with in-pit overburden emplacement continuing in South Pit and the construction of the Western Overburden Emplacement.

The Trommel commissioned in the previous reporting period has continued to operate.

No exploration activities were undertaken.

No construction works occurred on site during the reporting period; however planning continues on the realignment works associated with Marulan South Road and the required drainage associated with the Overburden emplacements.

Kiln operations have continued with no changes to processes.

## 4.2 Operations in the next 12 months

Over the next 12 months, operations will continue within the designated areas of the pit and ongoing construction of the Western Overburden Emplacement.

Work will commence on the Northern Overburden emplacement with associated drainage being installed.

Planning will continue for the future mine plan and will include possible relocation of the crusher and rail extension and design of the overburden emplacements.

Work should commence on the first stage of the Marulan South Road upgrade as well as commencement of the relocation of power lines associated with the Northern Overburden Emplacement.

No exploration activities are planned.

Kiln operations will continue with no proposed changes.

## 4.3 Production, Sales and transport for the last 12 months

### 4.3.1 Production, Sales

Table 4.1 provides a summary of production during the reporting period. Production is described as annual tonnages of Limestone, clay/shale and overburden.

Table 4.1 - Mine Production

| Material | Limestone (Tonnes) | Clay/shale (Tonnes) | Overburden (tonnes) |
|---|---|---|---|
| 2025/2026 | 2 501 728 | 61 695 | 2 981 645 |

Overburden removal of 2.9 million tonnes occurred during the 2025/2026 period. Total production of limestone and clay/shale was within the approved limit of 4 million and 200 000 tonnes per annum respectively.

During the 2025/2026 reporting period the lime manufacturing plant produced the following tonnages of Quicklime, Hydrated Lime and Waste Lime. (Table 4.2).

Table 4.2 – Lime Production

| Material | Quicklime (Tonnes) | Hydrated Lime (Tonnes) | Waste Lime (tonnes) |
|---|---|---|---|
| 2025/25026 | 63 074 | 52 010 | |

Lime production varies according to market demand and the current reporting period production levels are in line with recent years. There are no individual limits on Lime production however these are used in combination with total production and transport of products from the site.

### 4.3.2 Traffic and Transportation

The approved transportation limits compared to the actual tonnages is provided in Table 4.3.

Table 4.3 Transportation Compliance

| Condition | Details | Transported Tonnage FY2026 |
|---|---|---|
| A9 | A maximum of 1 million tonnes of manufactured sand may be transported to Peppertree Quarry in any financial year | 402 780 |
| A10 | A maximum of 150,000 tonnes of quarry products may be transported from Peppertree Quarry to the shared road sales stockpiling area in any financial year | 95,280 |
| A11 | A maximum of 720,000 tonnes of limestone, clay/shale and quarry products (combined) may be transported from the site by road in any financial year | 210,743 |

Boral is currently permitted to despatch laden trucks from “the site” under SSD-7009 (including the shared road sales stockpile area that also benefits Peppertree) within the following parameters:

*On school days, no more than 15 laden trucks per hour between:*
*5:30am and 7:30am and*
*8:30am and 4:00pm, and*
*No more than 5 laden trucks per hour:*
*On school days between 7:30am and 8:30am, and*
*Between 4:00pm on any day preceding a school day and 5:30am the following school day, and*
*On days that are not school days and do not precede a school day:*
*No more than 15 laden trucks per hour between 5:30am and 4:00pm,*
*No more than 5 laden trucks per hour between 4:00pm on any day and 5:30am the following day, and*
*No more than 75 laden trucks in total on any day*

As shown in Table 4.3, total product transported by road complies with limits provided by Conditions A9 to A11.

Additional limits are provided on 24-hour intervals by Conditions A12 and A13. Condition A12 provides for a maximum of 133 laden trucks to be dispatched from the site in any 24-hour period while Condition A13 provides for a maximum of six laden trains leaving the site in any 24-hour period.

However, Condition B88 restricts road movements to 75 trucks per day until Marulan South Road has been realigned and reconstructed. Details of 24-hour movements are provided in Table 4.4 along with monthly movements to show typical variations over the reporting period.

Table 4.4 – Monthly Truck Movements (Total and Maximum per 24hrs)

| | TRUCK | |
|---|---|---|
| | Monthly Movements | Maximum movements/24h |
| Jul-25 | 854 | 48 |
| Aug-25 | 938 | 69 |
| Sep-25 | 928 | 51 |
| Oct-25 | 1091 | 68 |
| Nov-25 | 1128 | 65 |
| Dec-25 | 858 | 74 |
| Jan-26 | 830 | 64 |
| Feb-26 | 1278 | 73 |
| Mar-26 | 1142 | 74 |
| Apr-26 | 1093 | 76 |
| May-26 | 1083 | 69 |
| Jun-26 | 1000 | 75 |

As required by section 7.11 of the EP&A Act, financial contributions are paid to Council to put toward the cost of maintenance of Marulan South Road due to its use for haulage of mining and quarry products. The contributions are calculated in accordance with the Goulburn Mulwaree Section 94 Development Contributions Plan 2009. As agreed with Council, contributions for haulage of mining and quarry products under the Continued Operation Project will be calculated and paid in accordance with this plan from 1/1/2024. Contributions prior to this were calculated based on the methodology for the previous DA and paid quarterly. In the reporting period (FY26) a total of $195 255.64 was paid in Council contributions.

On the 22dn April 2026 there was 1 truck movement above the daily limit contrary to Condition B88 of the consent. The incident was reported to DPHI with no actions required other than to keep records and report in the AEMR.

Discussions are ongoing with both the Limestone and Peppertree sites as well as Logistics to ensure truck movements are managed to the conditions.

## 4.4 Production, Sales and transport for the next 12 months

The anticipated production for 2027, is similar to the FY26 tonnes. However, actual realised tonnage will be dependent on market demand.

During the 2027 reporting period product dispatch will continue by Road and Rail as permitted.

## 4.5 Reserve and Resource Status and estimated mine life

The Marulan South limestone resource is significant, with current estimates in the order of 640 million tonnes. SSD7009 has secured 120 million tonnes which will be extracted over a 30-year period. Current studies undertaken as part of the SSD demonstrated that the limestone resource is extensive and can support at least a 30-year mine plan at an extraction rate of 4 Mtpa. The resource will not be exhausted at this time and depending on market conditions at the time, further approvals may be sought to continue extraction.

## 5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

This document represents the Annual Review prepared under Condition D11 of SSD7009 Consent which will be submitted to the Department of Planning, Housing and Infrastructure and Council.

The 2024/2025 Annual Review was accepted by the DPHI on the 29th October 2025.

Two actions were requested from the AR as follows:

- Review and revise the strategies, plans, and programs required under the consent and submit for Planning Secretary's approval, in accordance with Schedule 2, Condition D7 of the consent.; and
- In accordance with Schedule 2, Condition D17 of the consent, make a copy of the Annual Review available on the company website, including any other documents as required under Condition D17 and also ensure that these documents are up to date.

Review of the management plans was undertaken as required and the Annual Review made available on the company website.

Table 5.1 lists specific actions from the 2024/25 AR that were required to have been undertaken during the FY26 reporting period.

**Table 5.1: Actions Required from 2024/25 AR**

| Proposed Activities for 2025 | Requested by | Status | Where discussed |
|---|---|---|---|
| Review and/or prepare management plans - SSD approval requirements following approval of AEMR | DPHI Condition | Management plans reviewed, in place and approved. | Section 6.1 |
| Implementation of Management plans | Operator | As above | Section 6.1 |
| Active protection of nominated aboriginal sites | Operator | Areas regularly assessed | Section 6.10 |
| Preclearance surveys to be undertaken as required | Operator | Surveys have been undertaken as required | Section 6.11 |
| Update site water balance | Operator | Water Balance was reviewed by EMM | Section 7 |
| Undertake Rehabilitation activities | Operator | Rehabilitation activities undertaken in line with the Forward Plan | Section 8 |
| Continue mining operations | Operator | Mining continued | Section 4 |

## 6. ENVIRONMENTAL PERFORMANCE

The Limestone Mine has a comprehensive management and monitoring program that collects information and data for the assessment of environmental impacts, regulatory compliance, and performance against continual improvement objectives. Management and Monitoring is undertaken in accordance with the respective activity specific Management Plans, which define the framework for measuring environmental performance and compliance with statutory requirements.

Table 6.1 provides an overall summary of the environmental performance of the quarry across a number of parameters, with further details provided in the following sections.

**Table 6.1 Summary of Environmental Performance**

| Aspect | performance during the reporting period | Trend / Key management implications | Implemented / proposed management actions |
|---|---|---|---|
| **Deposition gauges** | Mine contribution complies with criteria at the neighboring residence | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to monitor and assess performance. |
| **PM10 HVAS** | Mine Contribution complies with criteria at the neighboring residence | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to monitor and assess performance.<br>Investigate and move the air quality monitoring points to the Boral owned boundary |
| **PM 2.5 HVAS** | Mine Contribution complies with criteria at the neighboring residence | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting at the boundary | Continue to monitor and assess performance<br>Investigate and move the air quality monitoring points to the Boral owned boundary. |
| **TSP HVAS** | Mine Contribution complies with criteria at the neighboring residence | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to monitor and assess performance.<br>Investigate and move the air quality monitoring points to the Boral owned boundary |
| **Noise** | Mine Contribution complies with criteria at the sensitive receivers | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to monitor on a quarterly basis.<br>Real time noise monitoring implemented to allow for management of potential noise impacts |
| **Blast - vibration** | Complies with criteria at the nominated receivers | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to operate as per NBMP and Blast Management procedures |
| **Blast – over pressure** | Complies with criteria at the nominated receivers | Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting | Continue to operate as per NBMP and Blast Management procedures |

| Aspect | performance during the reporting period | Trend / Key management implications | Implemented / proposed management actions |
|---|---|---|---|
| **Waste** | Waste management segregation system installed. | Waste minimization, recycling and tracking in Place | Continue to Implement waste management plan including review of recycling options and reduction at Waste to Landfill |
| **Dangerous goods & Hazardous materials** | Complies with relevant requirements with systems in place | Database in place | Continue to maintain systems |
| **Bush fire management** | Complies with relevant requirements with systems in place | Bush Fire management Plan in place and reviewed by the RFS | Continue to maintain systems and review bush fire management plan as required. |
| **Heritage conservation** | Complies with AHMP requirements with unidentified finds and the completion of salvage works | Management in place with regular review for Aboriginal and European heritage. | Continue to inspect on a regular basis "protected" heritage both Aboriginal an European. |
| **Biodiversity and rehabilitation** | Complies with BRMP and RMP | Rehabilitation plan in place and continues to be progressed. Some erosion control needed at identified locations. | Implement recommendations of the Rapid Visual Assessment and Ecological review. Implement Forward Plan commitments |

## 6.1 Boral Integrated Management System

The Limestone Mine operates in accordance with the Boral integrated Health Safety, Environment and Quality Management System (HSEQ MS) which establishes a strategic platform for Regulatory compliance and continual improvement in environmental management. This system is documented in the Marulan South Limestone Mine Environmental Management Strategy..

Under SSD7009, the following management plans have been prepared and approved by DPHI:

- Noise Management Plan.
- Blast Management Pan.
- Air Quality and Greenhouse Gas Management Plan.
- Water Management Plan.
- Aboriginal and Cultural Heritage Management Plan.
- Historic Heritage Management Plan.
- Traffic Management Plan.
- Biodiversity Management Plan.
- Environment Management Strategy.

These Management plans are reviewed and / or prepared in line with conditions of consent as well as aligned with the Boral HSEQ requirements.

The performance of the operation against the requirements of these plans, including any specific monitoring data or inspections required, are discussed in the following sections. In addition to these management plans, the operation also operates under a Water Management Plan which is discussed in Chapter 7 and a Rehabilitation

Strategy and Management Plan which are discussed in Chapter 8. DPHI were advised following the submission of the 24/25 AR that no material changes were required to most of the plans with the exception of the Water Management plan.

## 6.2 Meteorological Monitoring

Condition B34 of the development consent and condition M5 of EPL 944 requires monitoring of meteorological conditions at the site. The weather station was installed on 7/12/22 to provide continuous meteorological monitoring data for the operation.

Information from the weather station is supplied in real time graphical form to the Mine along with a monthly data report.

In addition, a forecasting system via Weatherzone is in place to provide alerts to relevant site personnel on predicted significant weather events such as high winds and extreme rainfall events, so that appropriate actions and controls can be proactively implemented.

## 6.3 Air Quality

An Air Quality and Greenhouse Gas Management Plan (AQMP) was prepared for the site as required by the development consent which was approved by the then DPE in September 2022. The management plan was reviewed in October 2025 and no changes were made. The AQMP documents control measures and management initiatives, with the main objectives being to minimise the dust exposure to all persons working on site as well as to reduce the offsite dust impacts, remain in compliance with stack emission limits and mitigate dust nuisance. The AQMP provides a program detailing the assessment criteria, monitoring locations and procedures, reporting protocol and compliance checking procedures for air quality management at the Mine for the Continued Operations project.

A number of PM2.5 and PM10 exceedances as outlined in Section 1 were reported to DPHI. It has been determined that the High Volume Air Samplers are not located at the Boundary of the Boral premises as required by the Approval and EPL and in line with the Air Quality Management Plan. The relocation of the monitors has been discussed with the EPA and a revision of the plan submitted to DPHI for approval to allow the monitors to be moved.

As the monitors are not located at the boundary, a review of the monitoring data is undertaken by a consultant and interpolated to the boundary.

### 6.3.1 Assessment Criteria

Marulan South Limestone Mine operates an air quality monitoring program as required by EPL Licence 944 and the AQMP. This program includes monitoring of ambient dust levels with deposited dust and particulates, as well as emissions of specific metals and both nitrogen and sulphur oxides from the kiln and hydrator stacks as detailed in Table 6.5. The NSW EPA air quality impact assessment criteria for dust emissions which are applicable to the Continued Operations Project are presented in Table 6.3 below.

**Table 6.3 – NSW EPA Air Quality Impact Assessment Criteria (dust)**

| Pollutant | Averaging Period | Impact | Criterion |
|---|---|---|---|
| TSP | Annual | Total | [a, c] 90 µg/cm$^3$ |
| $PM_{10}$ | Annual<br>24 hour | Total<br>Total | [a, c] 25 µg/cm$^3$<br>[b] 50 µg/cm$^3$ |
| $PM_{2.5}$ | Annual<br>24 hour | Total<br>Total | [a, c] 8 µg/cm$^3$<br>[b] 25 µg/cm$^3$ |
| Deposited Dust | Annual | Incremental<br>Total | 2g/m$^2$/month<br>4g/m$^2$/month |

***Notes:***

a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
b Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Planning Secretary.

The criterion allows for consideration of extraordinary events such as fire incidents and dust storms, which may cause exceedances beyond the actual dust contribution of activities associated with the Mine. To account for such events, the ash content of the monthly deposition gauge samples is also analysed to identify organic matter, which would not be typically representative of the Mine activities

The NSW EPA air quality impact assessment criteria for $NO_2$ and $SO_2$ emissions which are applicable to the Continued Operations Project are presented in Table 6.4.

**Table 6.4 - NSW EPA Air Quality Impact Assessment Criteria ($NO_2$ and $SO_2$)**

| Pollutant | Averaging Period | Criterion |
|---|---|---|
| $NO_2$ | 1 hour<br>Annual | 246 µg/cm$^3$<br>62 µg/cm$^3$ |
| $SO_2$ | 10 minutes<br>1 hour<br>24 hour<br>Annual | 712 µg/cm$^3$<br>570 µg/cm$^3$<br>228 µg/cm$^3$<br>60 µg/cm$^3$ |

### 6.3.2 Kiln and Hydration Stack Monitoring

In accordance with EPA Licence 944 Condition L2, the actual load of an assessable pollutant discharged from the mine during the reporting period must not exceed the load limit specified for the assessable pollutant in table 6.5 below. Emissions of these pollutants are monitored annually, and the actual load of each pollutant is calculated in accordance with the relevant load calculation protocol provided by the EPA and reported in the EPA Annual Return. The current load limits are detailed in Table 6.5.

**Table 6.5 - Assessable Pollutant**

| Assessable Pollutant - Air (Kg) | Coarse Particulates | Fine Particulates | Lead | Mercury | Nitrogen Oxides | Sulphur Oxides |
|---|---|---|---|---|---|---|
| Load Limit | 8,050 | 5,050 | 6.00 | 2.00 | 91,680 | 170 |
| Load 22/23 | 7,395 | 3,638 | 0.769 | 1.462 | 73,089 | 30.806 |
| Load 23/24 | 10,598 | 3,858 | 0.361 | 0.391 | 69,220 | 4.95 |
| Load 24/25 | 9066 | 5984 | 0.343 | 0.371 | 68,573 | 1147.401 |
| Load 25/26 | 10471 | 2490 | 1.41 | 0.141 | 29264 | 397.81 |

Kiln stack and hydrator stack monitoring results from the previous and the current reporting periods are presented in Table 6.6. All stack monitoring results were below the 100th percentile for both existing concentration limits and for Group 5 emission standards. The latest Annual Stack Monitoring was undertaken in October 2024.

Table 6.6 - Kiln Stack and Hydrator Stack Results

| Pollutant | Kiln Stack (11) | | Hydrator Stack (12) |
|---|---|---|---|
| Units: mg/m$^3$ | Nitrogen Oxides | Solid Particles | Solid Particles |
| Sampling Method: | TM-11 | TM-15 | TM-15 |
| Existing 100$^{th}$ percentile concentration limit | 2,500 | 250.0 | 250.0 |
| Group 5 100$^{th}$ percentile concentration limit | 2,000 | 100 | 100 |
| Result 2022/2023 | 300 | 43 | <2 |
| Result 2023/2024 | 300 | 64 | 1.5 |
| Result 2024/2025 | 350 | 65 | 1.6 |
| Result 2025/2026 | 130 | 44 | 2 |

Notes: Monitored results on a Dry Basis, corrected to 101.325kPa and 0$^0$C

### 6.3.3 Dust Deposition

Ambient dust levels are monitored at three depositional dust gauges. The dust gauges are referred to as,

- 'Freddy's Hill' (EPL Point 18) located to the northwest of the mine,
- 'Store Paddock Hill' located to the northeast of the mine (EPL Point 16) and
- the Sub Station (EPL Point 17), which was monitored from January 2023 as required by the EPL variation.

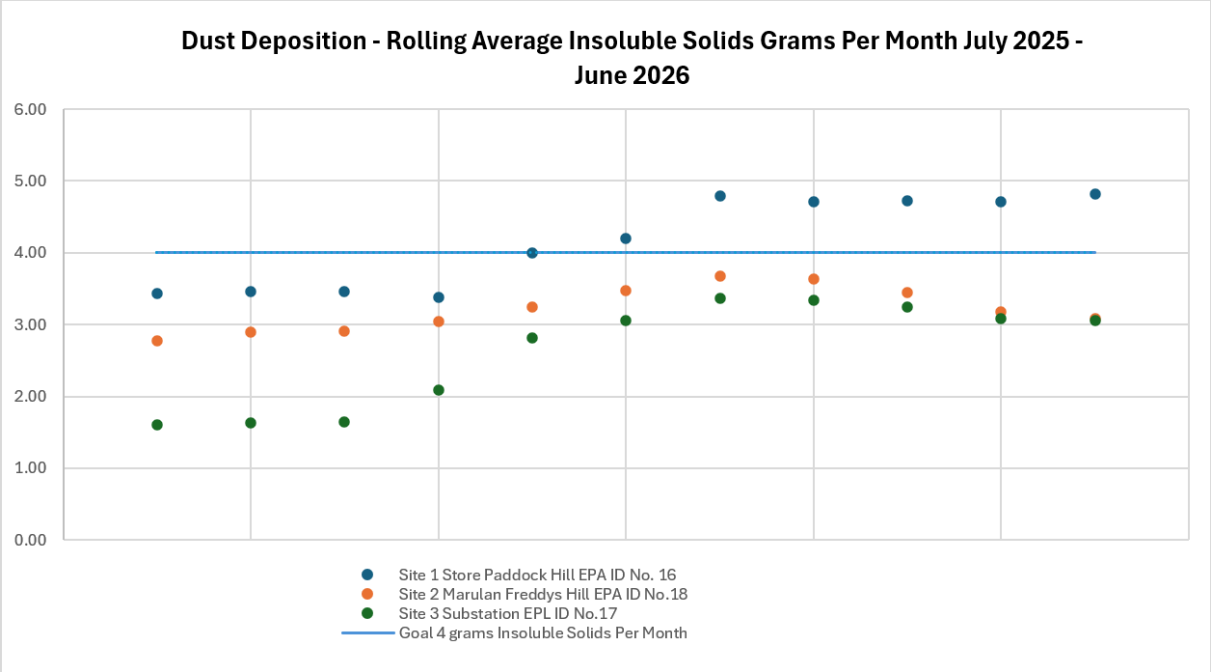
The dust deposition gauges are monitored by mine personnel with samples being delivered to NATA-accredited Boral Laboratories for dust analyses.

#### 6.3.3.1 Dust Deposition Performance review (2025/2026)

Results for dust deposition monitoring for the deposited dust monitoring sites are shown in Table 6.7 and Graph 6.3 below.

Table 6.7 – Deposited Dust (g/m$^2$/month Insoluble Solids)

| Site | Stores Paddock Hill (Point 16) | Sub Station (Point 17) | Freddy's Hill (Point 18) |
|---|---|---|---|
| Jul-2025 | 4.00 | 2.85 | 4.00 |
| Aug-2025 | 2.37 | 0.76 | 2.37 |
| Sep-2025 | 4.08 | 1.08 | 1.86 |
| Oct-2025 | 5.36 | 5.96 | 2.76 |
| Nov-2025 | 10.45 | 12.01 | 4.82 |
| Dec-2025 | 6.64 | 3.88 | 5.20 |
| Jan-2026 | 7.65 | 3.87 | 3.21 |
| Feb-2026 | 2.11 | 1.63 | 1.05 |
| Mar-2026 | 3.10 | 0.81 | 1.45 |
| Apr-2026 | 2.46 | 0.78 | 0.22 |
| May-2026 | 2.23 | 0.76 | 1.68 |
| Jun-2026 | No result | No result | No result |
| **Annual average** | 4.81 | 3.06 | 3.08 |




Graph 6.3 - Rolling Average Dust Deposition at EPL Points 16, 17 and 18

The annual average for the Store Paddock Hill Site 16 was 4.81 g/m$^2$/month (Table 6.7). Graph 6.3 shows that the annual rolling average stayed within the EPA Amenity Goal of 4 g/m$^2$/month from July 2025 until December 2026, with levels raising in the hotter and drier months of the reporting period. Whilst this gauge is located on Boral-owned land the data is useful in determining the relative sources of dust which contribute to the levels experienced at the nearest non-company owned residences further from the mine. The annual average during the 2025/26 reporting period was higher than that recorded in 2024/25, with an average of 3.39 g/m$^2$/month.

The deposited dust results from the Substation (Point 17) for the majority of the reporting period remained below the EPA amenity criteria guidelines, fluctuating from 0.76 g/m$^2$/month to 3.88 g/m$^2$/month with an annual average of 13.06 g/m$^2$/month during the reporting period (Graph 6.3, Table 6.7). Two results exceeded the guidelines in October (5.96g/m2/month) )and November (12.01g/m2/m).This year's annual average was higher than last reporting period with an average of 1.49 g/m$^2$/month.

The annual average insoluble solids at Freddy's Hill Site 18 was 3.08 g/m$^2$/month (Table 6.7) which is higher than the average last year of 2.67 g/m$^2$/month. The maximum was 5.2 g/m$^2$/month in December 2025, overall the rolling average was kept within the EPA Amenity Goal of 4 g/m$^2$/month. As with Point 16, the gauge is on Boral owned land. The distance to the nearest non-Boral owned residence is approximately 1.2km further to the northwest from this monitoring location.

### 6.3.3.2 Dust Deposition Long term trend Analysis

Freddy's Hill and the Substation monitoring sites are located proximal to residential receivers C1, B3, B4 and B5. The predictions based on the EIS modelling of cumulative impacts for Stage 1 of the Project can be compared to the above results. The results for Freddy's Hill and the Substation are in line with the EIS predictions, which modelled annual average deposited dust results ranging from 3.0-3.4 g/m$^2$/month at the receivers in close proximity. The Store Paddock Hill is located to the North-East of the site, and there are no nearby receivers.

In June 2026, samples were not able to be tested at the laboratory due to testing issues.

#### 6.3.3.3 Dust Deposition Summary and Opportunities for Improvement

As the dust gauges are situated on Boral owned land and not at the Boundary, consideration should be given to the relocation of the monitoring sites to the boundary.

### 6.3.4 Particulate Matter (PM2.5, PM10 and TSP High Volume Samplers (HVAS))

The three HVASs are on Boral owned land, situated together for the measurement of particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), less than 10 microns in diameter ($PM_{10}$) and Total Suspended Particulates (TSP.) They are programmed to operate on a continuous 24-hour period, on six in seven-day cycle. The HVAS sampler flows are subject to bi-monthly calibration and other parameters are calibrated on an annual basis.

A PM2.5 HVAS, which measures particulate matter less than 2.5 microns in diameter was brought online in March 2021. This monitor is in the same location of the existing PM10 and TSP HVASs.

The development consent provides the air quality criteria for the site as per Table 6.8.

**Table 6.8- Air Quality Criteria**

| Pollutant | Averaging period | Criterion |
|---|---|---|
| Particulate matter < 10 µm (PM10) | Annual<br>24 hour | 25 µg/m3<br>50 µg/m3 |
| Particulate matter < 2.5 µm (PM2.5) | Annual<br>24 hour | 8 µg/m3<br>25 µg/m3 |
| Total suspended particulate (TSP) matter | Annual | 90 µg/m3 |

It has been identified that the HVAS are not located at the boundary of the Marulan South limestone Mine and adjoining Peppertree Quarry who manage the HVASs. Therefore data obtained from these samplers needs to be interpolated to determine compliance at the nearest receiver.

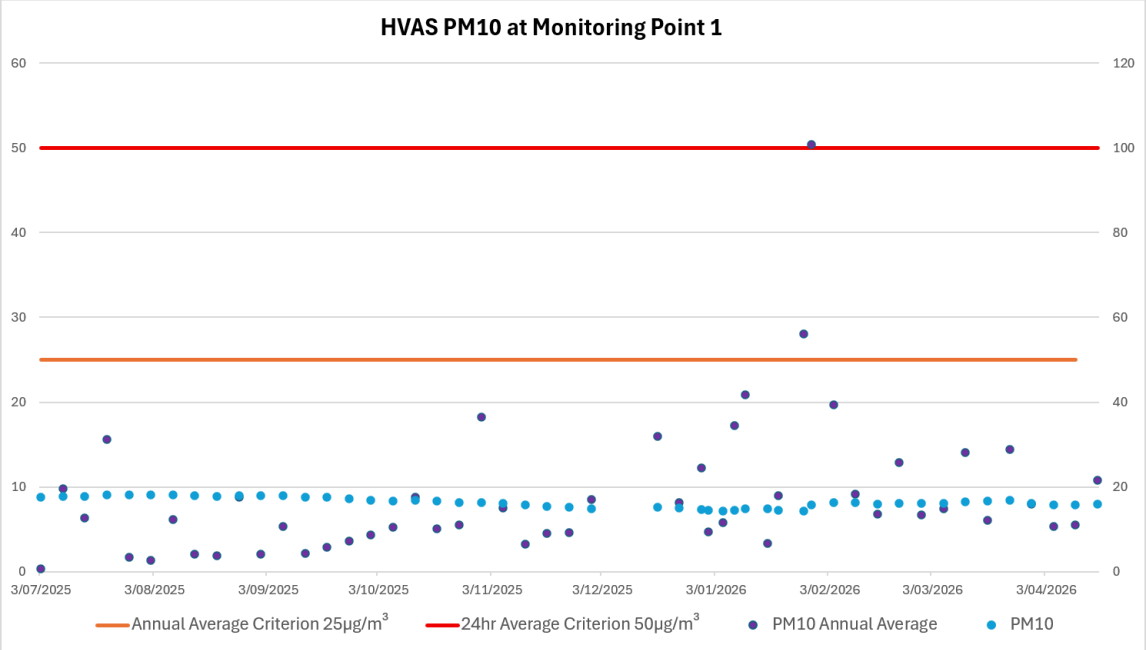
Regular reports are prepared by Todoroski Air Sciences with a review of the results that are then interpolated to the receivers.

The potential relocation of the HVASs to the boundary was reviewed in the 2025 reporting period, using existing data to analyse concentration changes with a broader dataset. The proposed new locations were discussed and approved by the EPA. These locations were updated in the Peppertree Quarry AQMP. The revised plan was issued to DPHI and is pending approval. Once this is approved, Marulan south limestone will revise their AQMP and seek the relocation of the HVASs.

#### 6.3.4.1 Particulate Matter Performance review (2025/2026)

##### 6.3.4.1.1 PM10

The $PM_{10}$ high volume air sampler (HVAS) is referred to and located at the 'Nearest Resident' and identified as Monitoring Point 1 in the EPL. The monitoring results for the reporting period are shown in Graph 6.4. The EIS cumulative impacts model predicted a $PM_{10}$ annual average of 27.5 µg/m³ at the Boral owned receiver B4 that is located at the HVAS site which is above the criteria of 25 µg/m³. The actual annual average for the reporting period was much lower than the prediction, recorded at 16.13 µg/m³ and well under the criteria. The minimum and maximum results for the 2025/2026 were 0.62 µg/m³ and 100.72 µg/m³ respectively. The $PM_{10}$ results are slightly higher than the previous reporting period which had an annual average of 14.57 µg/m.

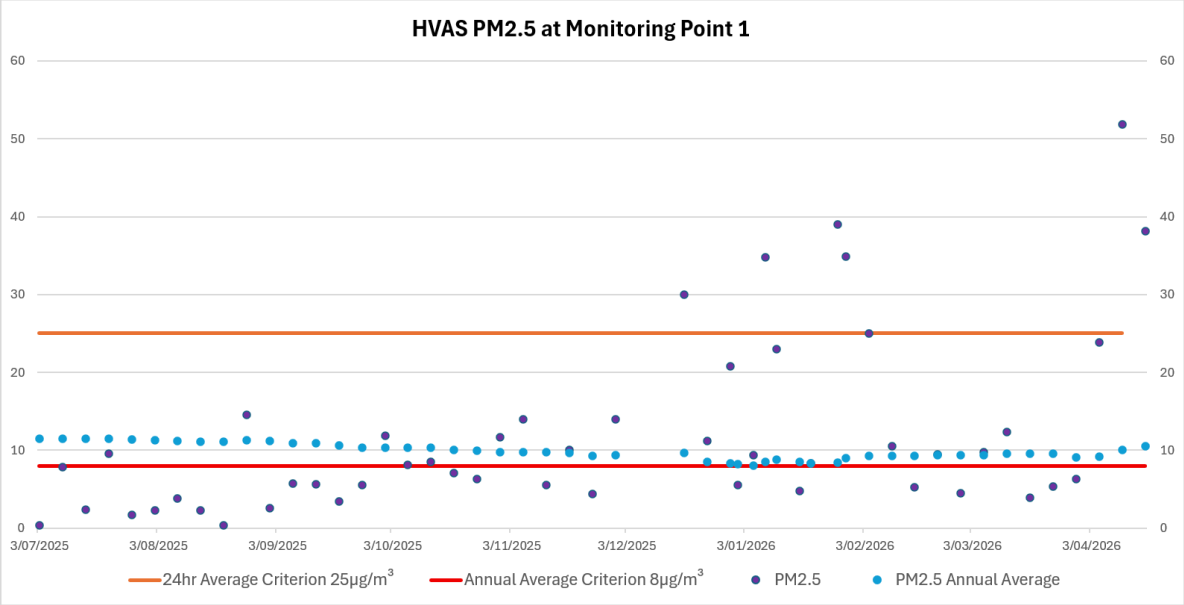



Graph 6.4 - $PM_{10}$ Monitoring Point 1 HVAS

#### 6.6.4.1.2 PM2.5

The $PM_{2.5}$ concentrations were monitored by the high-volume air sampler (HVAS) in conjunction with Peppertree Quarry from January 2023 as required by SSD7009 for the Continued Operations Project. The monitoring results for the reporting period and the previous period are shown in Graph 6.5. The maximum 24-hour average and annual average PM2.5 concentrations was 51.85, lower for this reporting period than the one prior. The 24-hour average PM2.5 exceeded the 24 –hour average assessment criteria on a number of occasions. A report generated from Todoroski Air Sciences interpolates the data to the boundary and in most cases the results are

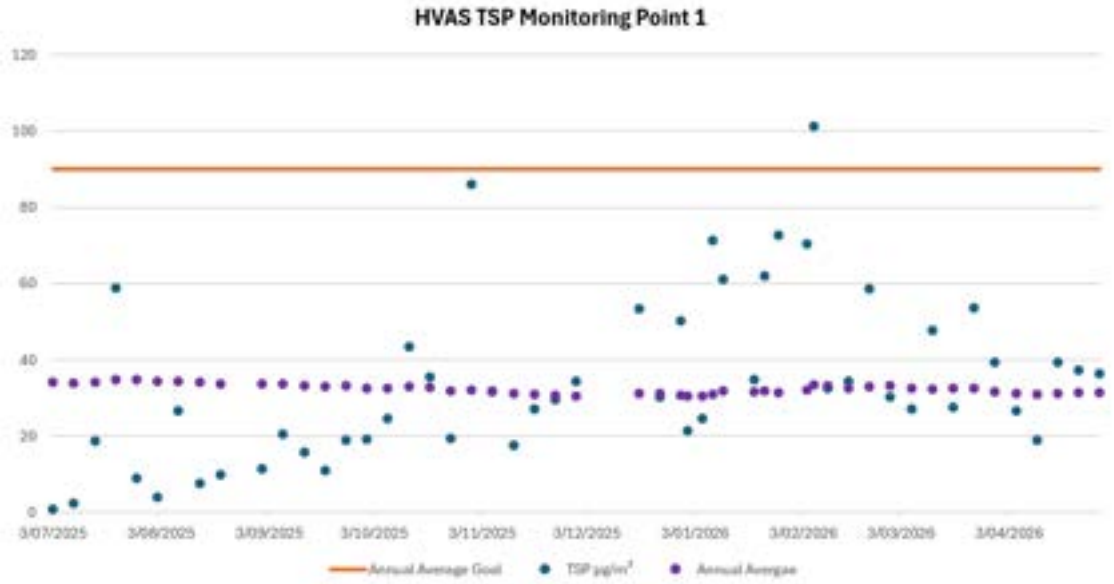
The annual average was 10.68 µg/m³, which is above the annual criterion of 8 µg/m³. Since the HVAS is located in Boral owned land, this is not classed as a non-compliance for the site as the criteria needs to be met at the boundary. These results were higher than the previous reporting period which had an annual average of 11.54 µg/m³. The EIS Stage 1 cumulative impacts model predicted an annual average $PM_{2.5}$ concentration of 6.59 µg/m³ at B4, which is lower than the 2025/2026 annual average.




Graph 6.5 - $PM_{2.5}$ Monitoring Point 1 HVAS

#### 6.3.4.1.3 TSP

TSP was also monitored by the site's HVAS from January 2023. Results for the reporting period and the previous period are shown below in Graph 6.6. The annual average was 31.84 µg/m³ with minimum and maximum results of 0.72 µg/m³ and 101.18 µg/m³ respectively and is below the annual criterion of 90 µg/m³. The TSP during the reporting period was lower than the previous years annual average of 34.22 µg/m³. The Stage 1 predicted cumulative annual average in the EIS for TSP at B4 was 60.4 µg/m³ which is higher than the recorded average for the reporting period.




Graph 6.6 - TSP Monitoring Point 1 HVAS

#### 6.3.4.2 Particulate Matter Long term trend Analysis

The TSP monitoring results are consistently below the average annual criteria of 90 µg/m$^3$. These results indicate that TSP dust levels are well below the long-term impact assessment criteria, which has been consistent over the years, and consistent with the EA predicted annual averages.

During the 2022/23, 2023/24 and 2024/25 reporting periods, the most discernible trend is that the highest TSP was recorded in the month of March and February respectively. The 2025/26 reporting period had its highest reading in February. As observed with the particulate matter, the general trend is the lowest readings for TSP are during July and August.

The $PM_{10}$ results have all been under the 24-hour average criteria (50 µg/m$^3$) with the exception of a number of specific events over the years. However, when interpolated to the boundary, all results were determined to be below the relevant criteria.

These results indicate that PM10 dust levels are generally below the long-term impact assessment criteria, which has been consistent over the years, and consistent with the EA predicted annual averages.

The trends visible below show that the $PM_{10}$ readings over the last two years have been lower during the cooler months of July, August and September.

The measured PM2.5 results have continued to be above the 24-hour average criteria. When interpolated to the boundary, results remained below the criteria. Independent Consultant assessments are undertaken for results above the criteria to understand the cause of the increased levels, which are usually found not to be due to Mine operations.

The maximum result for the last two reporting periods were both recorded during the month of October, and December however for this reporting period it was in May.

#### 6.3.4.3 Particulate Matter Summary and Opportunities for Improvement

As the HVAS are situated on Boral owned land and not at the Boundary, monthly interpolation of the data will continue to assess compliance with the relevant criteria.

Pending approval of the Peppertree AQMP incorporating new dust monitoring locations, HVASs will be relocated to the boundary with results better reflecting operational impacts at neighbouring sensitive receivers.

### 6.4 Operational Noise

In March 2022, the Noise Management Plan was approved and was reviewed in November 2023, 2024 and 2025 with no material changes required. This Management Plan details the noise criteria defined by Section B1 of the Continued Operations Project development consent, as provided in Table 6.11. The Noise Management Plan established a hierarchical approach to ensure that operations comply with the relevant conditions of the consent:

- Mine operations will be managed to meet the criteria presented in Table 6.11 and EPL noise criteria, through operational practices and the implementation of reasonable and feasible noise controls.
- Where noise levels exceed noise criteria or verified noise complaints are received, ensure all noise controls are in place or determine the need to reduce operations and point of source noise.
- Liaise with the local community regarding scheduled works which are predicted to have increased noise impacts.

Attended noise monitoring was undertaken quarterly during the reporting period by Muller Acoustic Consulting Pty Ltd. Attended noise monitoring was conducted at five noise monitoring locations for 15-minute periods for three attended events during day, evening, and night periods. Where possible, throughout each measurement the operator quantified the contribution of each significant noise source. Extraneous noise sources such as wind gusts, insects, birds, livestock, dog barking, aircraft and residential noise were audible throughout the attended

measurements. To supplement quarterly attended noise monitoring, a continuous unattended noise monitoring station has been established between the western overburden emplacement and the nearest potentially affected receiver location identified as R9.

**Table 6.11– Operational Noise Criteria**

| Receivers | Project Noise Trigger Level (dBA) | | |
|---|---|---|---|
| | Day | Evening | Night |
| R9 | 40 | 36 | 36 |
| All other residents | 40 | 35 | 35 |

*Note: Daytime 7:00am-7:00pm; Evening 7:00pm-10:00pm; Night 10:00pm-7:00am*

### 6.4.1 Operational Noise Performance review (2025/2026)

The site noise level contribution was below the operational noise criteria in Table 6.11 during monitoring events in July and October 2025, January and April 2026 at all receptor locations during all three time periods.

The mine was generally just audible at R8 and R9 throughout day, evening and night measurements. The mine was audible at R6 during day and night measurements only, and during day measurements only at R12. The mine was inaudible during all measurements conducted at location R17. Mine related noise included general processing noise, heavy vehicle movements, machinery operations and reverse alarms audible at R8 and R9. At R6 the mine related noise included site hum and machinery operation, while only heavy vehicle movements were audible at R12.

Furthermore, Low Frequency Noise was assessed as per the requirements of the Consent. Assessment of Low frequency noise was undertaken every quarter as part of the regular monitoring conducted at all receivers.

Tonal, low frequency, impulsive and intermittent noise characteristics were not found to present in the quarry noise emission results.

### 6.4.2 Operational Noise Long term trend Analysis

Noise levels for daytime, evening and night resulting from the continuation of mining operations for each stage of the 30 year mine life were predicted in the EIS. Noise levels from two worst-case operating scenarios comply with the noise trigger levels at all stages over all time periods. The predicted noise levels at Receiver 9 (R9) are shown in Table 6.12 below.

**Table 6.12 Predicted Noise Levels at R9 ($L_{Aeq,\ 15min}$ dBA)**

| Scenario | Stage | Daytime | Evening | Night | Complies |
|---|---|---|---|---|---|
| Overburden Removal, Overburden Emplacement, Limestone Removal ('4+2') | 1 Start | 30 | 31 | 31 | Yes |
| | 1 End | 27 | 28 | 28 | Yes |
| | 2 | 32 | 31 | 31 | Yes |
| | 3 | 29 | 30 | 30 | Yes |
| | 4 | 26 | 27 | 27 | Yes |
| Overburden Removal and Emplacement ('6') | 1 Start | 33 | 34 | 34 | Yes |
| | 1 End | 36 | 36 | 36 | Yes |
| | 2 | 34 | 35 | 35 | Yes |
| | 3 | 32 | 33 | 33 | Yes |
| | 4 | 26 | 27 | 27 | Yes |

Noise levels recorded from the mine were in line with the Scenario '4+2' predicted noise levels and below the Scenario '6' predictions outlined in Table 6.11 above. The contributions at all monitoring locations satisfied the consent conditions at their respective assessed receivers.

Current mitigation measures will continue to be followed to avoid the likelihood of exceedances in the future. This entails a quarterly noise monitoring program based on attended noise monitoring

### 6.4.3 Operational Noise Summary and Opportunities for Improvement

No improvements noted at this stage but noise management will continue to be conducted as per the Noise Management Plan.

## 6.5 Vibration and Air blasting

A Blast Management Plan was prepared in March 2022 under Condition B23 of the Continued Operations Project development consent and revised in December 2023. In accordance with Condition L5 of EPL 944, mining operations are required to employ practices to limit the effects from blasting as follows:

**Ground Vibration**

- Peak particle velocity not to exceed 10mm/sec
- Peak particle velocity not to exceed 5mm/sec in more than 5% of the total number of blasts over a financial year

**Blast Overpressure**

- Blast overpressure noise level not to exceed 120dB(lin) for any blast
- Blast overpressure noise level not to exceed 115dB(linear) in more than 5% of the total number of blasts over financial year

The above criteria also aligns with the operational blast emissions criteria (Continued Operations Project Development Consent Condition B11). As per the BMP, individual blast design records shall be maintained to assist in the design and optimisation of future events, planning and control of blasting emissions and to provide a traceable system of documentation in case of accident or complaint.

Predictions were made in the EIS based on a review of the last three years of blasting data. Table 6.9 below shows calculated overpressure and vibration levels at the B5 receiver due to blasting from the mine. The B5 receiver is located to the north-west of the operation at "Turkey Farm", 950m from the closest blast. The predictions below are assuming a Maximum Instantaneous Change (MIC) from the blast of 1,760 (8x220) kg.

**Table 6.9 Predicted Overpressure and Vibration Levels for Blasting Stage 1 and 2 at B5**

| Stage | Measurement | Result |
|---|---|---|
| 1 (Approximately 5 years; commencing 2019) | Peak Overpressure dB(Lin) | 117 |
| | PPV mm/sec | 2.34 |
| 2 (Approximately 7-8 years following Stage 1) | Peak Overpressure dB(Lin) | 113 |
| | PPV mm/sec | 1.34 |

The predicted blast vibration and overpressure levels are below the building damage criteria of 10mm/s and 133 dB(Lin) respectively and was also below the human annoyance and discomfort criteria of 2mm/s and 115 dB(Lin) at all dwellings of sensitive receivers.

### 6.5.1 Vibration and Air blasting Performance review (2025/2026)

Table 6.10 details the Airblast Overpressure and the Ground Vibration level monitoring results for the total 86 blasts undertaken at Marulan South during the reporting period. These blasts were monitored at the Boral owned residence on Marulan South Road to the northwest of the mine and at the Sub Station since January 2023 (located west to northwest of the pit on Marulan South Road). There were no exceedances of the overpressure or vibration criteria at Marulan South Road during the 2025/26 reporting period. On average blasting overpressure and vibration results at both Marulan South Road and the Substation were below the predictions. All blasting was undertaken within the approved time between 9:00am to 5:00pm Monday to Friday.

**Table 6.10- Blast Monitoring Results**

| Date | Time | Substation | | 643 Marulan South Rd | |
|---|---|---|---|---|---|
| | | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) |
| 9-July-25 | 1:07pm | 103.1 | 0.15 | No Trigger | No Trigger |
| 10-July25 | 3:08pm | 110.2 | 0.28 | No Trigger | No Trigger |
| 14-July-25 | 2:01pm | 101.9 | 0.06 | No Trigger | No Trigger |
| 16-July-25 | 3:38pm | 97.4 | 0.1 | No Trigger | No Trigger |
| 17-July-25 | 4:20pm | 103.5 | 0.2 | 108.3 | 0.4 |
| 23-July-25 | 3:41pm | 101 | 0.15 | No Trigger | No Trigger |
| 24-July-25 | 3:09pm | 106.2 | 0.07 | No Trigger | No Trigger |
| 31-July-25 | 1:40pm | 103.6 | 0.15 | No Trigger | No Trigger |
| 4-Aug-25 | 2:01pm | 106.7 | 0.14 | No Trigger | No Trigger |
| 7-Aug-25 | 3:38pm | 81.9 | 0.18 | No Trigger | No Trigger |
| 13-Aug-25 | 2:10pm | 93.9 | 0.18 | No Trigger | No Trigger |
| 18-Aug-25 | 2:38pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 21-Aug-25 | 3:41pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 27-Aug-25 | 2:05pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 28-Aug-25 | 2:11pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 1-Sep-25 | 1:09pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 4-Sep-25 | 3:02pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 8-Sep-25 | 2:59pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 15-Sep-25 | 2:14pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 17-Sep-25 | 2:10pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 18-Sep-25 | 2:12pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 24-Sep-25 | 2:18pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 25-Sep-25 | 2:15pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 29-Sep-25 | 2:09pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 2-Oct-25 | 2:21pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 3-Oct-25 | 2:21pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 8-Oct-25 | 2:02pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 13-Oct-25 | 2:24pm | No Trigger | No Trigger | No Trigger | No Trigger |

| Date | Time | Substation | | 643 Marulan South Rd | |
|---|---|---|---|---|---|
| | | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) |
| 16-Oct-25 | 2:10pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 20-Oct-25 | 2:44pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 23-Oct-25 | 2:02pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 29-Oct-25 | 2:05pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 5-Nov-25 | 4:07pm | 96.4 | 0.36 | 94.2 | 0.29 |
| 6-Nov-25 | 2:11pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 10-Nov-25 | 12:35pm | No Trigger | No Trigger | No Trigger | No Trigger |
| 13-Nov-25 | 2:11pm | 88.7 | 0.31 | No trigger | No trigger |
| 19-Nov-25 | 2:41pm | 98.1 | 0.21 | No trigger | No trigger |
| 20-Nov-25 | 1:59pm | No trigger | No trigger | No trigger | No trigger |
| 26-Nov-25 | 3:04pm | No trigger | No trigger | No trigger | No trigger |
| 27-Nov-25 | 1:01pm | No trigger | No trigger | No trigger | No trigger |
| 1-Dec-25 | 3:16pm | 88.2 | 0.28 | No trigger | No trigger |
| 4-Dec-25 | 2:34pm | No trigger | No trigger | No trigger | No trigger |
| 8-Dec-25 | 3:38pm | No trigger | No trigger | No trigger | No trigger |
| 10-Dec-25 | 12:36pm | No trigger | No trigger | No trigger | No trigger |
| 15-Dec-25 | 2:10pm | No trigger | No trigger | No trigger | No trigger |
| 18-Dec-25 | 2:04pm | No trigger | No trigger | No trigger | No trigger |
| 22-Dec-25 | 2:30pm | No trigger | No trigger | 100.2 | 0.22 |
| 7-Jan-26 | 2:27pm | 99.7 | 0.24 | 103.7 | 0.23 |
| 8-Jan-26 | 2:04pm | No trigger | No trigger | No trigger | No trigger |
| 14-Jan-26 | 2:13pm | No trigger | No trigger | No trigger | No trigger |
| 15-Jan-26 | 11:58pm | 93.9 | 0.26 | No trigger | No trigger |
| 19-Jan-26 | 2:39pm | No trigger | No trigger | No trigger | No trigger |
| 22-Jan-26 | 2:04pm | 95.7 | 0.2 | No trigger | No trigger |
| 28-Jan-26 | 2.23pm | No trigger | No trigger | No trigger | No trigger |
| 29-Jan-26 | 2:04pm | No trigger | No trigger | No trigger | No trigger |
| 4-Feb-26 | 2:54pm | No trigger | No trigger | No trigger | No trigger |
| 9-Feb-26 | 1.36pm | No trigger | No trigger | No trigger | No trigger |
| 12-Feb-26 | 1:31pm | No trigger | No trigger | No trigger | No trigger |
| 16-Feb-26 | 3.35pm | No trigger | No trigger | No trigger | No trigger |
| 19-Feb-26 | 3:46pm | No trigger | No trigger | No trigger | No trigger |
| 23-Feb-26 | 2:50pm | No trigger | No trigger | No trigger | No trigger |
| 2-Mar-26 | 2:48pm | 102 | 0.2 | 106.3 | 0.22 |
| 4-Mar-26 | 2:05pm | No trigger | No trigger | No trigger | No trigger |
| 9-Mar-26 | 3:45pm | No trigger | No trigger | No trigger | No trigger |
| 12-Mar-26 | 2:16pm | No trigger | No trigger | No trigger | No trigger |

| Date | Time | Substation | | 643 Marulan South Rd | |
|---|---|---|---|---|---|
| | | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) | Overpressure dB (Lin Peak) | Ground Vibration (mm/s) |
| 16-Mar-26 | 2:37pm | No trigger | No trigger | No trigger | No trigger |
| 19-Mar-26 | 2:16pm | No trigger | No trigger | No trigger | No trigger |
| 23-Mar-26 | 2:40pm | No trigger | No trigger | No trigger | No trigger |
| 26-Mar-26 | 2:36pm | No trigger | No trigger | No trigger | No trigger |
| 30-Mar-26 | 3:28pm | No trigger | No trigger | No trigger | No trigger |
| 2-Apr-26 | 4:04pm | No trigger | No trigger | No trigger | No trigger |
| 9-Apr-26 | 2:00pm | No trigger | No trigger | No trigger | No trigger |
| 13-Apr-26 | 2:00pm | No trigger | No trigger | 104.1 | 0.3 |
| 15-Apr-26 | 12:11pm | No trigger | No trigger | No trigger | No trigger |
| 30-Apr-26 | 2:08pm | No trigger | No trigger | No trigger | No trigger |
| 6-May-26 | 2:53pm | No trigger | No trigger | No trigger | No trigger |
| 11-May-26 | 3:31pm | No trigger | No trigger | No trigger | No trigger |
| 14-May-26 | 2:08pm | No trigger | No trigger | 111.5 | 0.26 |
| 18-May-26 | 3:01pm | No trigger | No trigger | No trigger | No trigger |
| 25-May-26 | 2:03pm | No trigger | No trigger | No trigger | No trigger |
| 1-Jun-26 | 3:39pm | No trigger | No trigger | No trigger | No trigger |
| 4-Jun-26 | 1:48pm | No trigger | No trigger | No trigger | No trigger |
| 15-Jun-26 | 2:06pm | No trigger | No trigger | No trigger | No trigger |
| 18-Jun-26 | 2:02pm | No trigger | No trigger | No trigger | No trigger |
| 22-Jun-26 | 3:34pm | No trigger | No trigger | 96 | 0.23 |
| 25-Jun-26 | 3:36pm | No trigger | No trigger | 99 | 0.29 |

### 6.5.2 Vibration and Air blasting Long term trend Analysis.

For both Vibration and Over pressure, the results for this reporting period are consistent with previous years. Additionally, trend analysis depicts that throughout the operational period, airblast overpressure and ground vibration has remained consistent.

All blasts were found to be compliant with Airblast Overpressure and Ground Vibration blasting criteria (as per Table 6.9) and predicted in the EA.

### 6.5.3 Vibration and Air blasting Summary and Opportunities for Improvement

No improvements noted at this stage but blasting will continue to be conducted as per the Blast Management Plan and Borals Blast management procedures.

## 6.6 Waste Management

Boral is committed to continuing the minimisation of waste from its operations, in accordance with the waste hierarchy and minimizing the amount of waste sent to landfill. All liquid and solid wastes are classified and sorted so they can be appropriately reused and recycled.

Waste generated by the Mine operations is collected and segregated to allow the proper storage and end use of the waste material to be managed.

Waste is classified in accordance with the NSW EPA Waste Classification Guidelines thereby advising on the appropriate management and / or disposal.

Domestic and light industrial waste continues to be deposited in large dumpsters which are collected weekly by a licensed waste removal contractor.

All runoff from the workshop is channelled through an oil and grease separator. Recovered grease and oil material is collected and stored for removal by a licensed recycling contractor. Similarly, grease drums and oil filters are stored until collected and disposed of for recycling by a licensed contractor.

Reject lime continues to be placed in the designated area of the Middle Gully waste emplacement and investigations continue for reuse of this material to minimise on-site disposal.

A Waste Management Plan is in place, which outlines the management methods in place for each waste, with contracts in place with licensed contractors where appropriate, refer Table 6.11.

**Table 6.11 Waste Management Methods**

| Waste | Waste Classification | Management Method |
|---|---|---|
| Oil absorbent pads | Solid general waste | Once used, bagged and placed in bin for landfill providing no liquid oil present. |
| Food scraps | Solid general waste | Bagged and placed in bin for landfill |
| Oil filters | Solid general waste once oil has been drained | Drained of oil, placed in bin for recycling |
| Oily rags / waste | Solid general waste | Oily rags are bagged and placed in bin for landfill |
| Conveyor belt | Solid general waste | Complete belts are collected and stockpiled for reuse. Contract is in place with companies who repair the belts to remove the damaged belts.<br>Scrap belting is placed in a designated bin for recycling. |
| Oil drums | Solid general waste | Drained on site, stockpiled in designated area, and crushed for recycling |
| Empty IBC Containers | Solid general waste | Stockpiled in designated area and returned to supplier |
| Steel | Solid general waste | Offcuts and parts are placed in designated steel skip bins for recycling |
| Waste oil | liquid waste | Collected and stored onsite in purpose designed oil tank adjacent to the workshop. This tank is emptied on a regular basis with the oil taken for recycling by a licensed regulated waste transporter |
| Tyres | solid general waste | There is very little storage of tyres on site. Tyres are replaced by designated contractors who take the damaged tyre for recycling or disposal. |
| Timber pallets | Solid general waste | Pallets and timber waste are placed in designated timber skip bins for recycling.<br>Pallets in good condition will be returned to the supplier where possible |

| Waste | Waste Classification | Management Method |
|---|---|---|
| Batteries | Solid general waste | Collected and recycled through regional facilities |
| General rubbish | General | General solid waste |
| Overburden | Virgin excavated natural material (VENM) | Emplaced within approved designated emplacements on site |

## 6.7 Hazardous Material Management

The Mine has a Safety Data System (SDS) in place utilising the ChemAlert Program. A Hazardous and Dangerous Goods Register is in place, which identifies each chemical stored onsite. The register is electronically filed with a physical copy kept within the Site Office.

In accordance with Project Approval Condition B74 (Part B), all dangerous goods and chemicals are handled and transported in accordance with AS1940 and AS1596 and the Dangerous Goods Code.

There are multiple hazardous chemical facilities at the mine with two diesel, two LPG, one compressed gas, and one distillate depot which are maintained in accordance with the Work Safe NSW Acknowledgement of Notification of Dangerous Goods on Premises Licence 35/008099. Explosives used for blasting are supplied by the contractor as necessary and not stored on site.

As required, all enclosures to fuel facilities are bunded to meet AS 1940 Storage and Handling of Flammable and Combustible Liquids, 2017 and hazardous materials and chemicals facilities are inspected at least annually by an external accredited inspector.

## 6.8 Hydrocarbon Contamination

Hydrocarbons used on site include fuels (diesel and petrol), oils and greases. A designated area (HME Go line) is in place for parking and refuelling of equipment. A 95,000L double lined diesel tank is in place as well as being fully bunded where any potential spills can be adequately contained and managed in accordance with emergency response procedures and classified and disposed of in accordance with relevant waste legislation.

The potential for hydrocarbon contamination resulting from leakages and spills continues to be minimised by the implementation of documented hydrocarbon spill procedures and the use of biological oil spill kits located across site operational areas. These spill kits are maintained and serviced by approved contractor services every 2 months.

Oils are stored within three bunded bulk storage tanks with a maximum of 10,000L each tank used for hydraulic oil, engine oil, and torque fluids. These three tanks feed into smaller containers in a bunded area of the machine shop where small quantities of greases are required for maintenance of plant and equipment. Storage, handling, containment and disposal of workshop hydrocarbons is managed in accordance with AS 1940:2004. A self-contained oil and water separator controls the runoff of the workshop floor which is monitored, maintained and cleaned when required. Two self-bunded containers were purchased and installed on site this reporting period, one at the store and one at the machine shop to contain and store hydrocarbons.

Review of procedures, equipment and training for hydrocarbon management and spill response is an ongoing commitment. Testing of the management system and responses is undertaken generally every 12 months.

## 6.9 Bushfire

Bushfire response and management is an ongoing site program both from a safety and environmental aspect. The Marulan South Operations Bushfire Management Plan seeks to maintain and monitor bushfire prone

areas and equipment; minimise the risk of bushfires spreading from the project site; and establish responses and controls to fires.

An annual bushfire risk assessment is undertaken at the commencement of each bushfire season in October. The bushfire management plan addresses associated risks and lays out requirements for very high-risk days relating to things such as hot work, vehicles driving on vegetation etc. Boral is aware of the risks of bushfire and has implemented the following safeguards:

1. Firefighting equipment is always on hand during hot work activities;
2. Safe Work Method Statements are required for all activities on site, and the risks of bushfire are considered;
3. Fire extinguishers are installed in mobile machinery;
4. Cleared asset protection zones have been created around all buildings and infrastructure;
5. Water storages on site are available for use in firefighting as necessary; and
6. One of the two water carts on site must remain full at all times to be available on site for emergencies.

The Bushfire Management Plan was reviewed in February 2020 following the Morton Bushfires. Specific measures for evacuation were updated to include refuge in the pit as a secondary option to evacuation via Marulan South Road as it was demonstrated that the fire threat could be more widespread than previously mitigated against. Three levels of threat were identified based on RFS categorisation and associated response measures incorporated into the management plan.

During the reporting period, bushfire risk has been low, however improved foliage growth following favourable conditions and with reduced rainfall expected in future months, could increase in bushfire risks in the next period.

The Bushfire Management Plan was last reviewed in November 2025 with no changes.

## 6.10 Aboriginal Heritage

The Aboriginal Cultural Heritage Management Plan (ACHMP) was approved in March 2022 in accordance with Condition B60 of the Continued Operations Project development consent. The management plan was reviewed in October 2025 following the submission of the pervious AR, and no changes were made.

Salvage works were undertaken and completed in the previous reporting period with Management Plan updates submitted to DPHI. Approval is pending.

Planning has commenced to undertake a Return to Country of the previously salvaged artefacts.

## 6.11 Biodiversity

A Biodiversity Management Plan (BMP) was prepared in accordance with condition B54 of the Continued Operations Project development consent which was approved in April 2022 and reviewed in December 2024 and again in 2025. The BMP covers vegetation clearing, management of remnant vegetation, pest and weed management, establishes biodiversity performance indicators and rehabilitation completion criteria as well as ongoing biodiversity monitoring initiatives. The specific objectives of the BMP are to:

- comply with requirements including the development consent;
- meet the obligations and commitments identified in the EIS;
- ensure compliance with relevant environmental legislation;
- outline management actions and controls to protect and enhance biodiversity values;
- ensure appropriate and representative monitoring is conducted for verification that the BMP is effectively implemented and meeting its objectives; and

- ensure appropriate contingencies and resources for mitigating adverse impacts to native vegetation areas.

The BMP has designed the following vegetation clearing protocol which is implemented prior to and during the clearing of vegetation on site:

- ground dwelling fauna will be identified and relocated prior to clearing;
- suitably qualified personnel will be engaged to supervise felling of hollow bearing trees;
- displaced fauna will be caught and relocated to pre-designated areas by qualified wildlife handlers; and
- the NSW Wildlife Information and rescue Service will be requested to handle and care for wildlife encountered during operations.

### 6.11.1 Clearing of Vegetation

A total of 8 preclearance survey reports were prepared and land cleared using the above protocol in the reporting period under guidance and supervision of an ecologist. Refer table 6.12 The disturbance areas are identified in Appendix 1, Figure 4.

**Table 6.12 Preclearance Survey reports**

| Report Date | Area | Findings |
|---|---|---|
| 13/8/2025 | White Clay | 1 Habitat tree identified, no species spotted during nocturnal survey<br>Ecologist supervision required during clearing |
| 21/8/2025 | Area 3 | 2 Habitat tree & wombat burrow identified, no species spotted during nocturnal survey. Ecologist supervision required during clearing |
| 21/8/2025 | Bush Dump | 4 Habitat trees identified, no species spotted during nocturnal survey. Ecologist supervision required during clearing |
| 20/2/2026 | White Clay | 3 Habitat trees & 2 wombat burrows identified, no species spotted during nocturnal survey. Adult Kookaburra seen feeding nestlings in November survey. Fledging had left at the time of the second survey. Ecologist supervision required during clearing. Advised no clearing during Spring |
| 20/2/2026 | Western Overburden | 4 Habitat trees identified, no species spotted during nocturnal survey. Ecologist supervision required during clearing |
| 13/3/2026 | White Clay | Refer 20/2/2026. Resurvey of the site as outside of the 21 days clearance |
| 13/3/2026 | Western Overburden | Refer 20/2/2026. Resurvey of the site as outside of the 21 days clearance |
| 28/5/2026 | White Clay | Resurvey of the site as outside of the 21 days clearance |

Most of the disturbance was in a northerly direction associated with the Western Overburden Emplacement (WOE) with a much smaller area being disturbed to the west of the South pit site. The area identified at the WOE has been disturbed with vegetation clearance and emplacement of overburden being commenced. Work in the south pit continues in line with Land being prepared for rehabilitation.

A record of all surveys and clearing are kept by the mine in progress reports produced by the ecologist.

### 6.11.2 Biodiversity Offsets

A Biodiversity Development Assessment Report was prepared By Niche to support the EIS for SSDA7009. This identified a number of ecosystems and species that would be impacted by the project and generated the number of credits of each that would be required to offset these impacts. Boral has offset the impacts using two properties, which are established as Stewardship Sites under the BAM to provide in-perpetuity protection and management of biodiversity values. Short-, medium- and long-term measures have been developed as part of the Biodiversity Stewardship Agreements (BSAs) to manage the offset areas. The majority of the required credits have been retired through the Boral owned Stewardship Site Coolumburra' which satisfies all the ecosystem credit requirements (except for Box Gum Woodland) and the majority of the species credit requirements for the Project.

The site is now under active management with detailed specific management measures and monitoring requirements which have commenced. Year 3 of annual reporting to BCT was submitted in March 2026.

Boral has negotiated security of credits to satisfy the full State and Commonwealth offset liabilities for Box Gum Woodland via a privately owned existing Biodiversity Stewardship Agreement. The residual species credit requirement have been met by payment into the Biodiversity Conservation Fund and through the purchase of credits from other approved third parties.

## 6.12 Combustion Risk and Management

The storage of coal used as a supplementary fuel for the calcination of limestone in the lime kilns is the only activity previously identified on site with the potential for spontaneous combustion. The primary use of natural gas as kiln fuel has reduced the potential risk of spontaneous combustion.

The risk of spontaneous combustion is minimized by CO monitoring, alarming and a triggered, stored $CO_2$ discharge system sized to extinguish combustion. This system is serviced by Wormald, a division of Tyco Australia Pty Ltd. These services are carried on a planned preventative maintenance schedule held within BCL's MAXIMO maintenance management system.

## 6.13 Geotechnical Stability

Open pit and waste emplacement slope stability is an aspect of limestone mining activities with the potential for both safety and environmental impacts particularly as the depth of mining increases. The use of improved blasting techniques, the development of procedures for managing slope stability issues and training instruction for site inspection continue to be implemented.

A Geotechnical investigation was undertaken in July 2025 by Pell Sullivan Meynink (PSM) for the preparation of the annual geotechnical report for the Marulan Limestone Mine. The assessment predominantly focused on inspection of pit exposures and proposed progression of the mine, inspection of the Barbers Creek Emplacement following evidence of failure in November 2022, and sediment and water storage stability.

A number of recommendations were made to assess long term planning in the pit, limitations in areas of mining following large rain events and the management of water levels in storage dams. The management of Barbers Creek is an ongoing matter and further studies are underway.

## 6.14 Public safety

A security plan has been fully operational since 2006 and was upgraded with the new access requirements between Peppertree and the mine. This plan is reviewed annually.

Features of the security plan and system include the following:

- A 3 metre-tall automated sliding security gate at the exit of the Sand Plant Road.
- A 3-metre-tall sliding gate located at the Main office, connected to chain mesh fencing for appropriate scrutiny of all site visitors.

- A pedestrian gate near the visitor's car park for office access to ensure visitor sign in.
- Two swing gates located on the Lime Kiln Road prior to the main weighbridge and associated chain mesh fencing.
- Chain mesh fencing of the mine site perimeter and around the main entry areas to limit points of entry and exit to the control points (gates).
- Signage for both the new and existing mine perimeter fencing.

All visitors report to the "off lease" Site Administration and Training Main Office to sign in prior to gaining entry to Mining Lease 1857.

Review and upgrade of the Site's Induction system for visitors, contractors and employees is an on-going commitment as part of the Site Safety Management System.

# 7. WATER MANAGEMENT

An updated site Water Management Plan (WMP) was completed in August 2022 and reviewed as per the Consent in 2025, following the submission of the AR. It was identified that material changes were required and a revised plan issued to DPHI for approval.

## 7.1 Erosion and Sediment Management

Current methods of erosion control including the use of clean water diversions to limit run off over disturbed areas, contour banks on the exposed batters of waste emplacements, rock and concrete lined drainage structures, sediment ponds and the re-establishment of vegetation continue to be effective means of reducing erosion on exposed areas. Periodic inspections on drainage are performed to ensure water runs to either the North pit or South pit voids.

The erosion and sediment control system is managed through control plans which have been progressively updated to meet changes as the project develops. The WMP continues this process in order to meet the obligations and commitments identified in the SSD approval. The existing surface water management system provides measures to divert runoff from the overburden emplacements to sediment basins designed in accordance with current guidelines. Rehabilitated landforms are designed to shed water without causing excessive erosion and downstream pollution. During rehabilitation, topsoil is prioritised for the high-risk erosion areas on the overburden emplacement slopes, and alternative media for vegetation growth is used on lower slopes and flat areas.

Maintenance of dams and drainage lines continued where possible following high rainfall events which occurred during the reporting period.

### 7.1.1 Sewerage Waste Management

No changes to sewerage waste management have occurred during the reporting period. The Marulan South Limestone Mine continues to operate five sewerage treatment facilities:

- Main envirocycle unit that receives effluent from main offices, laboratory, bathrooms, store and conference room. This aerated water treatment system was refitted with new pumps and upgraded during the reporting period to maintain compliance with Council requirements.
- Two Lime plant envirocycle units servicing the kiln control room, hydration, dispatch and workshop areas.
- Two Septic tanks, one located at the “machine shop”/primary crusher the other adjacent to the “Fettlers’ shed”.

Another septic system services the former “Club” facility, north of the main office and located “off-lease”.

To ensure no overflow occurs from the “machine shop”/primary crusher septic tank, this unit continues to be inspected and pumped out weekly by an accredited waste disposal contractor. The “Fettler’s shed” and “Club” units are adequately serviced by adsorption trenches.

The septic units listed above are inspected quarterly to ensure compliance with Council's regulations.

## 7.2 Surface Water Management

### 7.2.1 Pollution Control Strategies

The Marulan South Limestone Mine continues to operate under the Environment Protection Licence (EPL) No. 944 and is required to prevent pollution of waters. The existing water management system involving three major catchments, (northern, southern and western emplacement areas) and associated infrastructure continued to operate during the 2025/2026 reporting period. The performance measures for the pollution control system are as follows:

- Maintain separation between clean, dirty (i.e. sediment laden) and mine water management systems.
- Minimise the use of clean and potable water on the site.
- Maximise water recycling, reuse and sharing opportunities.
- Minimise the use of make-up water from external sources.
- Design, install, operate and maintain water management systems in a proper and efficient manner.
- Minimise risks to the receiving environment and downstream water users.

The surface water management system is an integrated network of pipelines, drains, dams and sediment basins that provide dual purposes of water supply for on-site use and erosion and sediment control functions for runoff generated from disturbed areas. The water management system continues to be progressively developed over the life of the mine.

### 7.2.2 Surface Water Monitoring and Reporting

The approved surface water monitoring program is detailed in the Water Management Plan for the Continued Operations project. Surface water monitoring is undertaken quarterly at sites upstream and downstream of the mine. These sites include the Shoalhaven River, Bungonia Creek and Barbers Creek refer Appendix 4. An additional sample is taken from the lower end of the Blowhole, prior to entry into Bungonia Creek. The Blowhole is a groundwater seep, or spring which is representative of groundwater situated below the elevation of South Pit. The surface water monitoring results are outlined below in this section, and a comprehensive description can be found in the Surface Water Assessment Report attached as Appendix 2.

Additionally, an automatic water sampler is located in the lower section of Main Gully which is triggered automatically when the water levels in the sediment control pond rise and a discharge occurs.

Overflow events and associated water results are detailed in Table 7.2. As part of the agreed management of the water level of the Closed Catchment Dam, water was pumped from this site and into the water management system of the Mine. This resulted in some water reporting to Main Gully resulting in a discharge of water. These discharges were sampled as required by the water Management plan. More details are available in the Surface Water Assessment report in Appendix 2.

**Table 7.1- Main Gully Overflow Water Quality Monitoring Results**

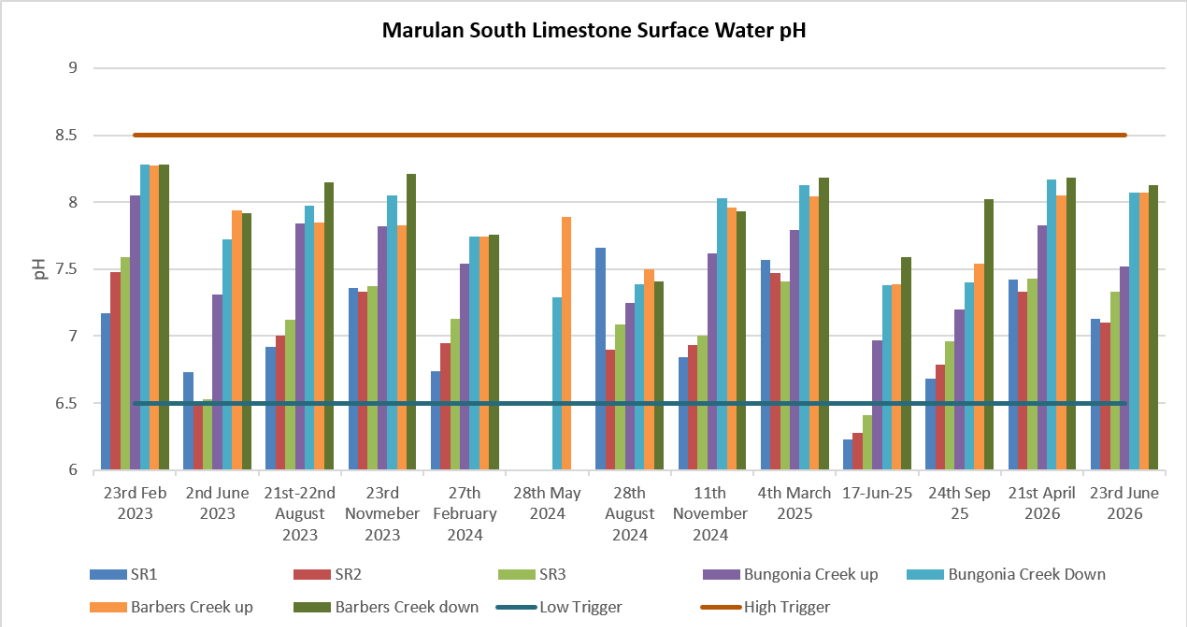
| Date | pH Units | Suspended Solids (mg/L) | Turbidity (NTU) | Oil and Grease (mg/L) |
|---|---|---|---|---|
| 2/07/2025 | 7.92 | 1650 | 3820 | <5 |
| 2/08/2025 | 8.03 | 1600 | 3110 | <5 |
| 18/08/2025 | 7.93 | 8 | 20.6 | <5 |
| 2/09/2025 | 8.34 | 2.5 | 3.6 | <5 |
| 3/09/2025 | 8.38 | 16 | 22 | <5 |
| 4/09/2025 | 8.34 | 40 | 71 | <5 |
| 5/09/2025 | 8.39 | 2.5 | 2.9 | <5 |
| 6/09/2025 | 8.38 | 8 | 14 | <5 |
| 7/09/2025 | 8.35 | 8 | 16.6 | <5 |
| 8/09/2025 | 8.37 | 12 | 11.7 | <5 |
| 9/09/2025 | 8.4 | 16 | 24.8 | <5 |
| 10/09/2025 | 8.35 | 2.5 | 7 | <5 |
| 10/02/2026 | Results missing | | | |

| Date | pH Units | Suspended Solids (mg/L) | Turbidity (NTU) | Oil and Grease (mg/L) |
|---|---|---|---|---|
| 3/03/2026 | 7.25 | 184000 | 329000 | <5 |
| 4/03/2026 | 7.63 | 96300 | 192000 | <5 |
| 5/03/2026 | 7.64 | 51200 | 96200 | <5 |
| 7/03/2026 | 7.83 | 9380 | 14800 | <5 |
| 29/03/2026 | 7.89 | 12 | 9.8 | <5 |
| 28/05/2026 | 8.14 | 2.5 | 2.3 | <5 |

Historically, results show that during storm events when discharge occurs, suspended solids can be elevated however pH and conductivity are comparable with Bungonia Creek. Figure 11 of Appendix 2 shows that suspended solids loading with Bungonia Creek were lower during the same period. Although the Main Gully discharge can have an influence on solids loading within Bungonia Creek, Figure 11 of Appendix 2, shows that the upstream sample site in Bungonia Creek also had a slightly higher suspended solids loading than the downstream site over the reporting period. Figure 27 of Appendix 2 shows that the Shoalhaven River was also elevated upstream of the confluence with Bungonia Creek indicating that there was widespread movement of sediment within the receiving waters over the period. However, over the reporting period, levels of sediment were less than those measured at the Main Gully discharge.

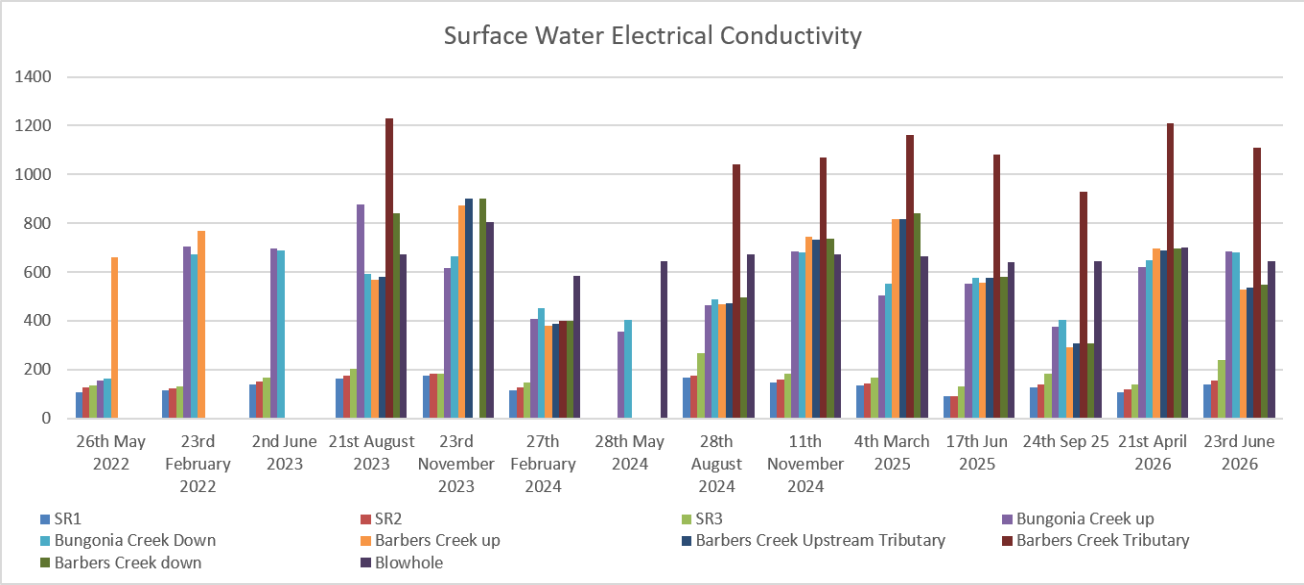
An extended ambient surface water quality monitoring program is also in place as envisaged in the EIS. Sampling was increased from biannual to quarterly at the beginning of 2023. This includes measurements taken from sites upstream and downstream of the mine on Bungonia Creek and Barbers Creek, at three sites along the Shoalhaven River (SR) and at the Main Gully Sample Point located downhill of the Spring (Blowhole).

Surface water trigger values have been outlined in the Water Management Plan and are noted in Graphs 7.1 - 7.6 below. The purpose of the trigger values is to provide indicators of whether the mine is having an influence on the receiving water quality and as an indicator when action may need to be undertaken. Graphs 7.1 - 7.6 present the water quality parameters over the last three reporting periods.




Graph 7.1 – Ambient Surface Water Quality – pH

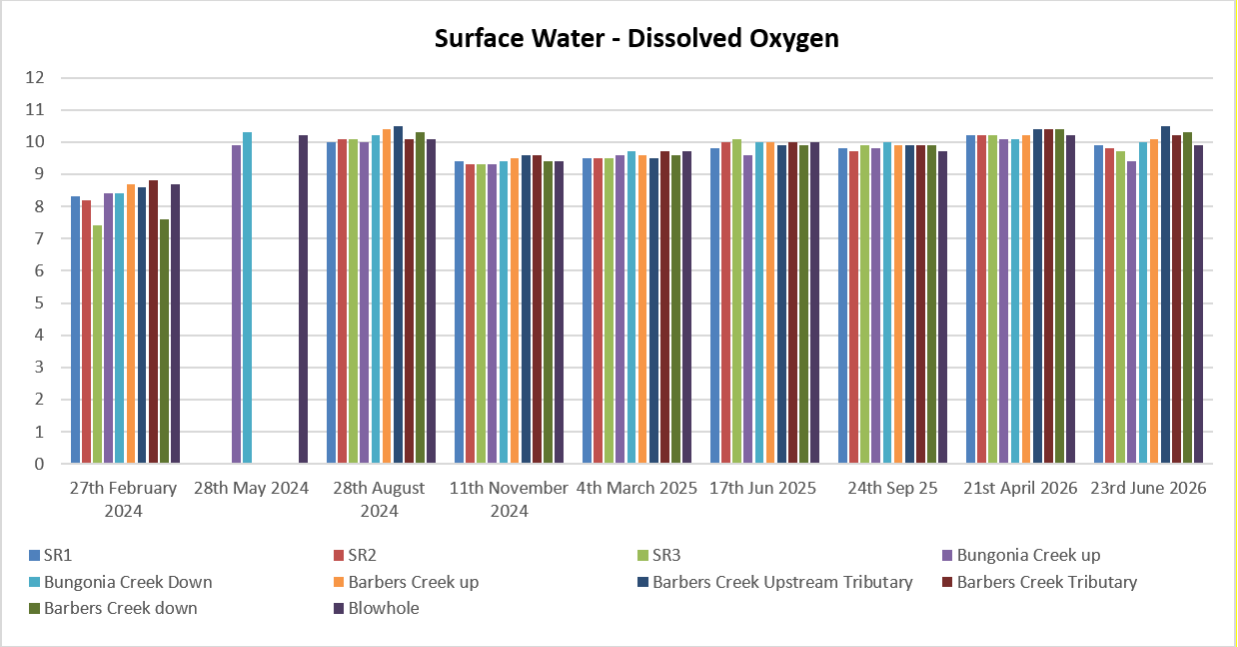
Graph 7.1 shows the pH values of seven sample sites over the past three reporting periods and historically. All results were within the specified pH range over the reporting period. SR1, SR2 and SR3 continued to have lower values than the other locations. SR1 is located in Bungonia Creek upstream of the mine, SR2 is located in Bungonia Creek downstream of the mine with SR3 located at the Shoalhaven River downstream of the confluence of Bungonia Creek, indicating that the wider area experiences a lower pH value overall. All other pH results for the seven sample sites in the last reporting period and since February 2023 are within the upper and lower trigger values. The pH is governed by geological influences, particularly the large limestone deposit. Given the limestone's marine origin, salt level is also largely controlled by geological influences.




**Graph 7.2 – Ambient Surface Water Quality – Electrical Conductivity**

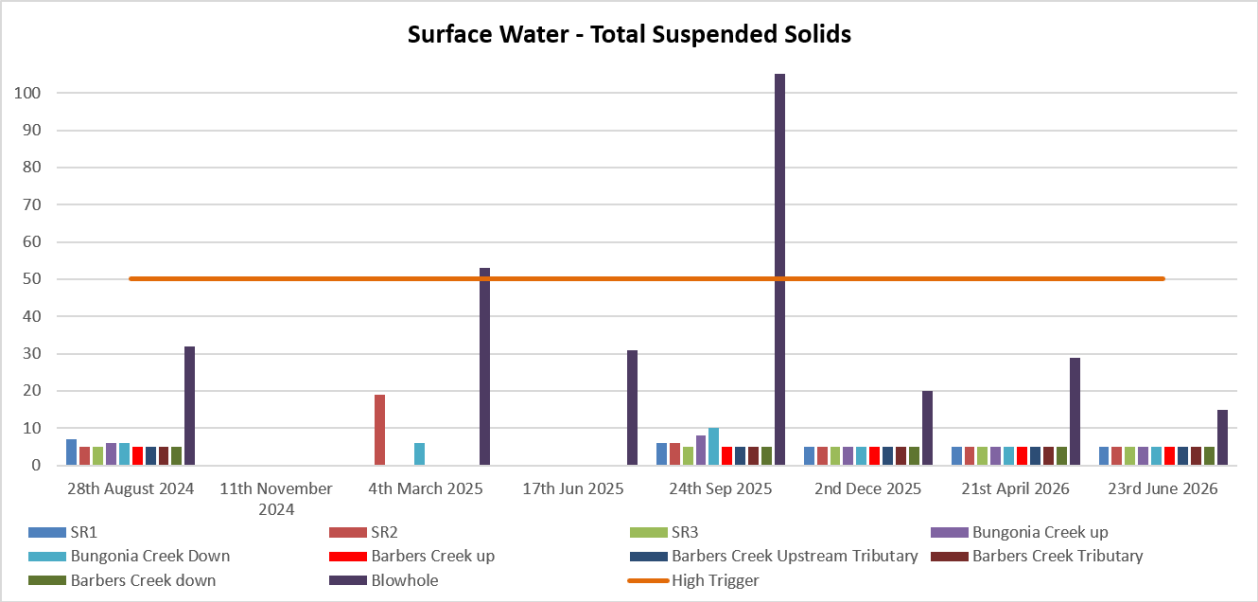
The electrical conductivity is significantly lower in the Shoalhaven River than all other sampling sites with a three-year average of 182 µS/cm (Graph 7.2). Bungonia and Barbers Creek downstream three-year averages of 569µS/cm and 634 µS/cm respectively lie significantly lower than the trigger value of 1600 µS/cm and show levels representative of the surrounding limestone aquifer. The three-year average conductivity values have increased since the previous reporting period in Barbers Creek and Bungonia Creek. This may be due to the lower rainfall experienced in recent years. The average electrical conductivity at the Blowhole recorded over a three-year period is 668 µS/cm and has remained relatively stable over time. Although the majority of levels of electrical conductivity have increased during the reporting period, the water quality remains in a healthy and stable state.

The variation in pH and conductivity, which is a measure of salt, is considered natural and caused by surrounding marine based geological strata. The physical and chemical properties of Shoalhaven River will naturally vary as it passes through different geological strata and land uses. The variations would occur in mineral content, nutrients, pH and dissolved solids.



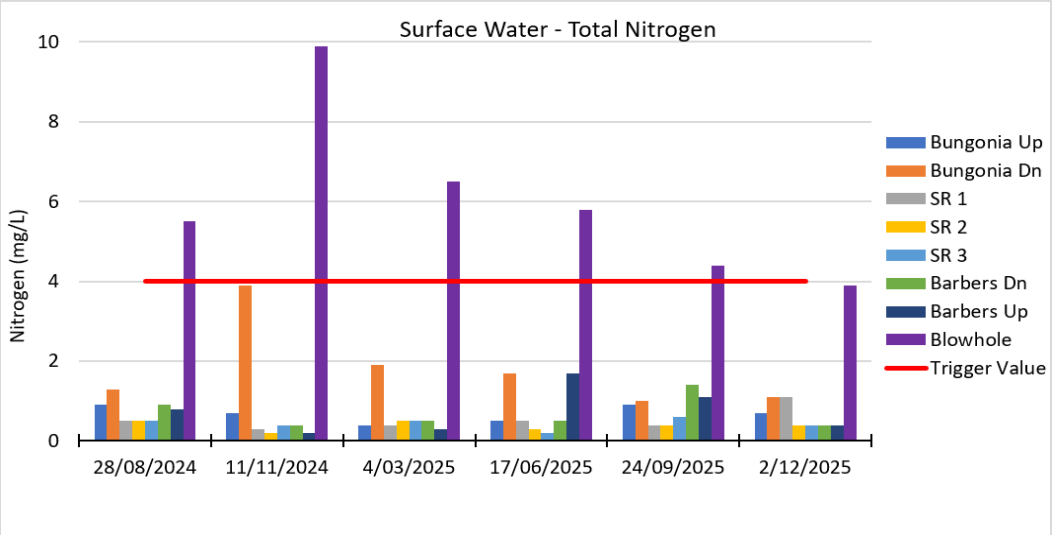

**Graph 7.3 – Ambient Surface Water Quality – Dissolved Oxygen**

The dissolved oxygen levels range from 9.4 mg/L to 10.4 mg/L with an average of 9.7 mg/L over a three-year period across all ambient surface water monitoring sites (Graph 7.3). Results show that the waterways have sufficient dissolved oxygen levels to support a healthy aquatic environment including fish populations.




**Graph 7.4 – Ambient Surface Water Quality – Total Suspended Particles**

All sites had Suspended solid concentrations below the trigger level during the reporting period, with the exception of the Blowhole which exceeded on one occasion. (Graph 7.4). This elevated level may have been associated with the discharge to Main Gully in the previous weeks.

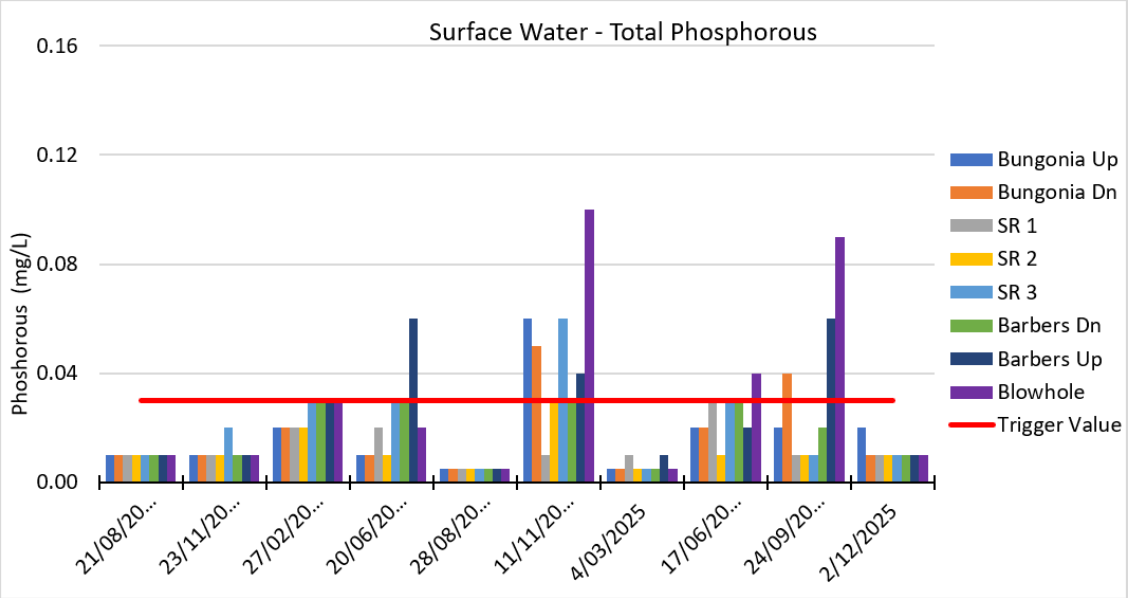



**Graph 7.5 – Ambient Surface Water Quality – Total Nitrogen**

Total Nitrogen levels were the highest at the Blowhole with a three-year average of 5.3 mg/L (Graph 7.5). Concentrations at Bungonia and Barbers Creeks downstream locations remained below the trigger level of 4 mg/L with respective averages of 1.6 mg/L and 0.69 mg/L. All other sample locations remained below the trigger level in the reporting period.

Total Nitrogen is the combined value of both Nitrite (NH2-) and Nitrate (NO3-) in the natural environment, Nitrite readily oxidises to Nitrate. Therefore, the nominated trigger value of 4mg/L of Nitrogen is conservative. ANZECC 2000 guidelines state that Nitrate concentrations less than 400mg/L in livestock drinking water should not be harmful to animal health. The Australian Drinking Water Guidelines (2011) stipulate 50mg/L of Nitrate as an appropriate long term health criterion in drinking water.

Nitrogen and Phosphorous occur naturally but are also caused by agricultural fertilisers. Although Nitrogen levels at the Blowhole are high, it does not pose a hazard to either humans or animals. However, the cause of the elevated Nitrogen is unknown. For natural systems to yield Nitrogen at the measured levels would indicate the presence of high levels of organic matter. As the volume of the Blowhole discharge is relatively small, there is only a minor increase in Nitrogen levels downstream.




**Graph 7.6 – Ambient Surface Water Quality – Total Phosphorous**

As shown in Graph 7.6, in the last reporting period phosphorous was above the trigger levels at two sites (Barbers Creek upstream and Bungonia downstream) in September 2025 as well as the Blowhole for most of the reporting period. The source of the phosphorus is unknown but is usually associated with runoff from soils in agricultural areas within the catchment. For the past two years the phosphorus levels have generally remained below the trigger level. The concentration of nutrients will continue to be monitored. The concentration levels are not likely to cause adverse algal growth within the receiving waters.

The WMP has also included a requirement to conduct quarterly stream and riparian vegetation health inspections of surface water monitoring sites. The inspections commenced in the 2023 reporting period and have involved photographing the channel and creek banks, description of the condition and noting any changes observed since the last inspection. The most recent inspection was conducted in June 2026 which concluded that there were no visual changes to the geomorphology or surrounding vegetation to the creeks and river which could be attributed to the mine. There has been some evidence of sediment movement over time which may have been derived from rehabilitated slopes, however the movement of sediment downstream is a natural process which is necessary to maintain a healthy river system.

The assessment confirmed that based on the observations, there have been no impacts to groundwater dependent ecosystems, the alluvial aquifers or the natural springs within the gorge. The complete Surface Water Assessment Report has been attached as Appendix 2.

### 7.2.3 Aquatic Biodiversity Monitoring

In accordance with the Biodiversity Management Plan, a baseline aquatic biodiversity monitoring was undertaken by Niche in November 2024 (Spring) where a total of 16 monitoring sites were included in the study across 5 stream networks, including three sites in Main Gully to assess the macroinvertebrate assemblages at Groundwater Dependant Ecosystem (GDE) survey sites which had not been previously monitored.

Results showed that the upstream control sites were comparable to the downstream sites. A total of 14 fish species were detected, 12 of them native. The two species with the highest detection rate were the were the Long-finned Eel (Anguilla reinhardtii) and the Australian Smelt (Retropinna semoni), which were both detected at 10 out of the 15 sites.

While spatial variability was detected it could be concluded that the macroinvertebrate assemblages and stream health indicators show that the taxa composition and biological health of the five streams are comparable at the control and treatment sites along the streams. The fish assemblage sampling did not detect the presence of threatened species in either the 2014/2015 or the 2024 sampling. Both surveys had comparable common species detection with similar common species detected across the sites. Overall, the results suggest that eDNA sampling is a superior method for the Program, with far more species being detected, with the approach allowing for a greater level of spatial representation across the waterways being surveyed.

No new surveys were conducted in the reporting period. The Biodiversity Management Plan outlined that ongoing and additional surveys will be conducted

*"After the first year of monitoring, additional aquatic monitoring will be undertaken if a surface water quality trigger threshold is exceeded on consecutive monitoring events*."

### 7.2.4 Surface water Summary and opportunities for Improvements

The Surface Water Monitoring and River Health report concluded:

*"The water quality results show that upstream and downstream water quality varies throughout the year but generally follow a correlated trend, that is, elevated elements downstream are caused by elevated levels upstream. The only variation to this occurs in Bungonia Creek where nutrients, particularly Nitrogen are higher downstream compared to the upstream site. This variation is caused by the groundwater discharge from the Blowhole site rather than the mine.*

*The higher nutrients from the Blowhole site are not causing a measurable change in the quality of the Shoalhaven River, however the origin of the water discharged from the Blowhole, which predates the mine, is unknown.*

*River health studies indicate that the receiving waters of Bungonia Creek are naturally actively eroding upstream of the mine site but become more depositional towards the confluence of the Shoalhaven River. There have been several significant changes to the bed and banks of Bungonia Creek towards the confluence with the Shoalhaven River over recent years, reflecting the impact of extreme storm events.*

*Barbers Creek is erosion controlled for its full length adjacent to the mine. This stretch is steep sided and prone to extreme velocities during storm events. There has been evidence of sediment movement, but the health of vegetation and the overall nature of the creek line has not changed over the past four years."*

It was recommended that the Water Management Plan be reviewed. A RFI is in place with the DPHI to undertake such a review in the next reporting period.

## 7.3 Groundwater Management

The quality and quantity of ground water may be impacted by sediments, dissolved salts, sewage effluent, hydrocarbons and chemicals generated or associated with surface water run-off from limestone mining and lime processing operations at the Marulan South Limestone Mine. Modelling and ongoing monitoring of the groundwater allows assessments of any possible impacts and management if necessary.

### 7.3.1 Monitoring and Reporting

There are three groundwater sources located on site, including a shallow unconsolidated aquifer within the weathered zone where groundwater exists between pores and deeper consolidated bedrock aquifer located between rock fractures.

A total of eight monitoring bores were installed in 2014 within and adjacent to the pit area to determine the baseline groundwater levels and quality for the SSD project groundwater assessment. Monitoring bores MW01 and MW02 were located in the north pit and south pit respectively and were removed as bench development progressed in 2017 and 2018. The six remaining bores are monitored for water quality twice-yearly. Screened formations of the bores include limestone, sandstone, weathered regolith and volcanics such as dacite, tuffs and andesite.

Table 7.2 – Ground water monitoring wells

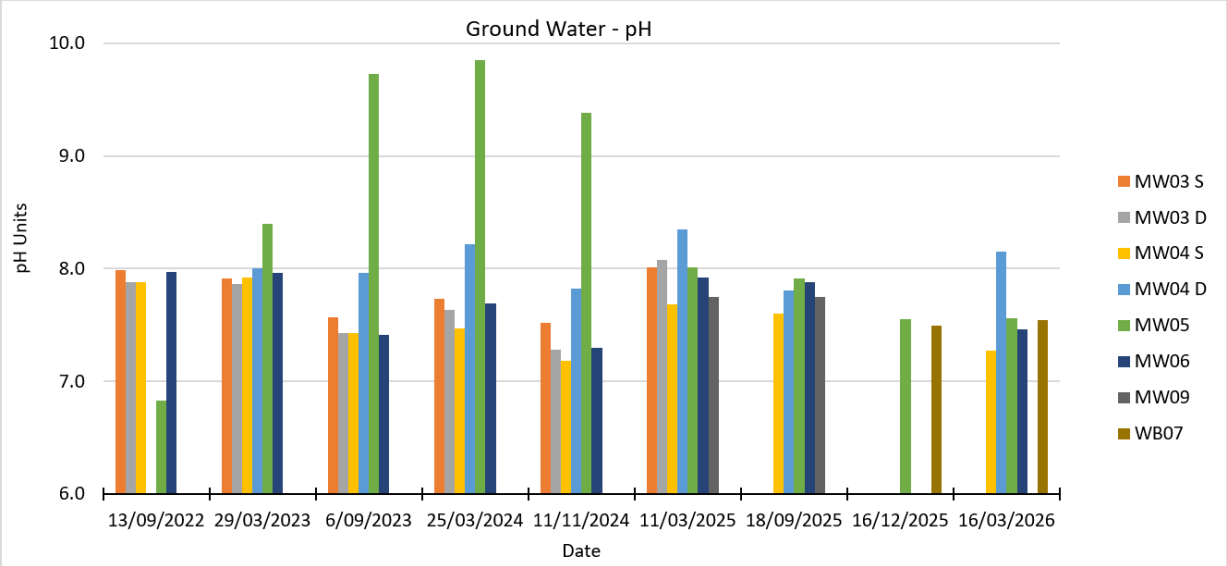
| Monitoring bore | Total monitoring bore depth (mbgl) | Screened Hydrostratigraphic unit | Continuous Datalogger Monitoring |
|---|---|---|---|
| MW04s | 40 | Weathered granite | Yes (6 hourly readings) |
| MW4d | 1124 | Fractured granite | Yes (6 hourly readings) |
| MW05 (EPL Point 13) | 98 | Weathered granite | Yes (6 hourly readings) |
| MW06 | 128 | Fractured granite | Yes (6 hourly readings) |
| MW08 | 94 | Limestone | No |
| MW09 | 101 | Weathered to fresh granodiorite | Yes (6 hourly readings) |

Monitoring Point 13 on EPL 944 requires monitoring of groundwater for oil and grease and suspended solids on a quarterly basis. Monitoring Point 13 is the groundwater bore MW05. Table 7.3 shows the results of monitoring as required by the EPL for the past two reporting periods whilst pH and conductivity are presented in Graphs 7.7 and 7.8 below.

Table 7.3 – EPL Monitoring Point 13

| Date | Oil and Grease (mg/L) | TSP (mg/L) |
|---|---|---|
| 25/11/2024 | <5 | 16 |
| 17/12/2024 | <5 | 102 |
| 11/3/2025 | <5 | 54 |
| 18/06/2025 | <5 | 41 |
| 18/09/2025 | <5 | 35 |
| 16/12/2025 | <5 | 54 |
| 16/03/2025 | <5 | 43 |
| 10/06/2026 | <5 | 69 |

All the results for the reporting period are below the detection limits for Oil and Grease. TSP ranges from 35 to 69 mg/L at the licenced monitoring point.

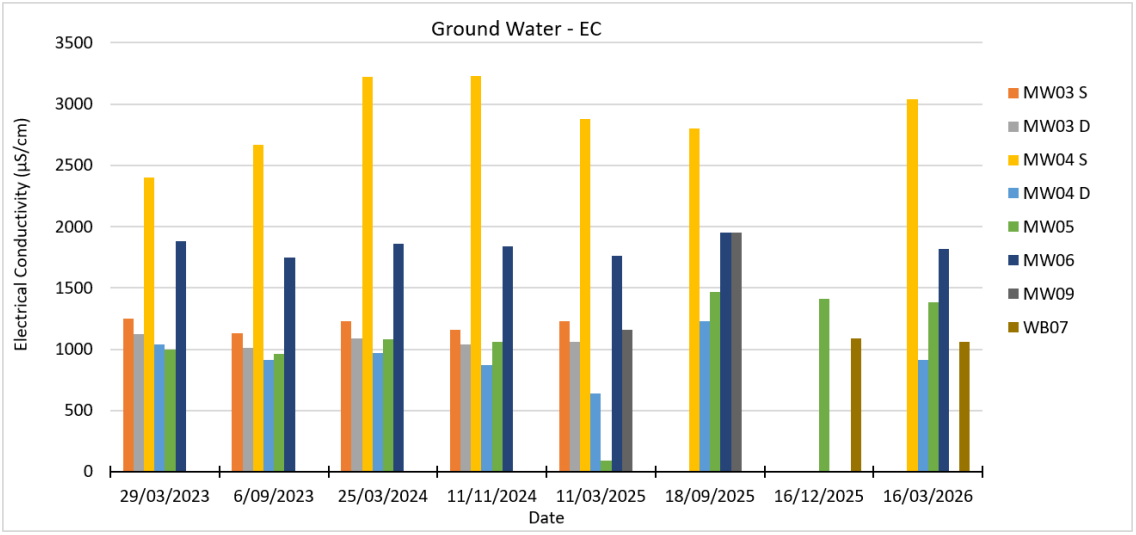



Graph 7.7 – Monitoring Bore Ground Water - pH

All bores excluding MW05 are neutral to slightly alkaline, within a 1 pH unit range (Graph 7.7). In the past, differences in pH levels have resulted from variability in host rock geology, although no such trends have been observed in the past two reporting periods. MW4D data began recording on the 29th March 2023, and MW09 on the 11th March 2025.

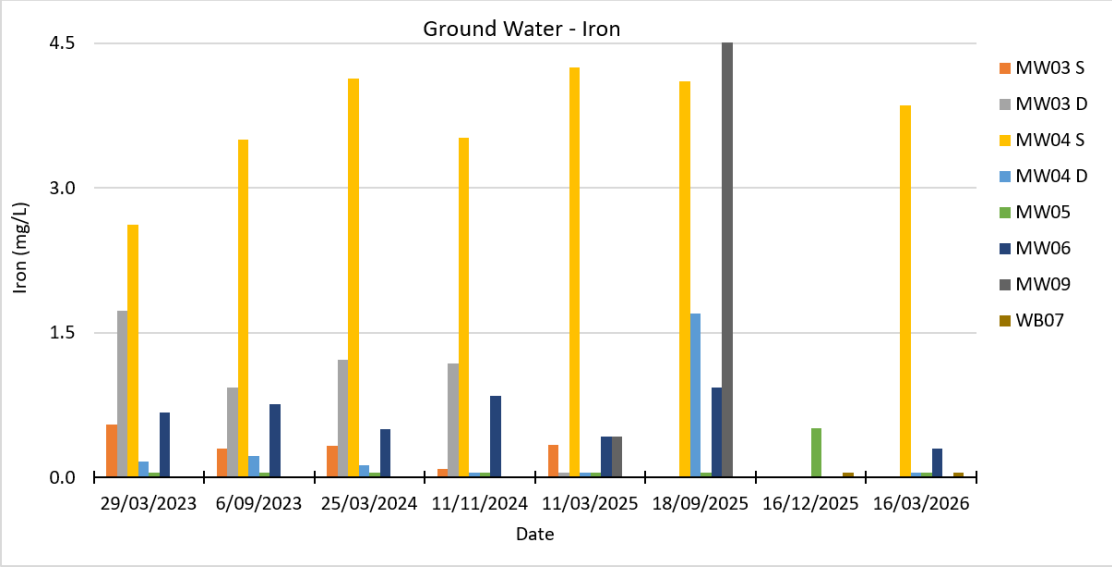
The pH of MW05 has been variable over the last three years and has continued to show a downward trend in this reporting period. The long term average from 2014 until the end of this reporting period is pH 9.4. During this reporting period the pH ranged from 7.55 to 7.91 pH units.

There is a positive correlation between pH and alkalinity, so as total alkalinity (ppm CaCO3) falls the natural buffering capacity of the water decreases as does its ability to neutralise acid, and pH decreases. The drop in pH was attributed to a decrease in water level which had reduced the aquifer's exposure to the baked limestone in the proximity of the bore, which in turn reduced its inherent carbonate concentration. Since March 2024, pH has continued to decrease and would be as a result of dropping levels and decreased rainfall.




Graph 7.8 – Monitoring Bore Ground Water - Electrical Conductivity

Graph 7.8 shows variability among monitoring bore conductivity levels over the past three reporting periods. Host geology significantly influences conductivity of the bores, with limestone bores such as MW05 with the lowest salinity ranging from 90 to 1080 µS/cm, and bores hosted in volcanics with conductivity levels as high as 2050 µS/cm at MW06 and 3230 µS/cm at MW04S which has been increasing over the past 18 months. This fresh to slightly brackish water is defined as 'marginal' for drinking water use, but suitable for stock water and aquatic ecosystems. During the reporting period, the 95th percentile trigger values for EC and dissolved iron (1738 µS/cm and 2.15mg/L respectively) for MW04S were exceeded for a third consecutive monitoring round in March 2024 triggering the TARP. Another round of monitoring undertaken in June indicated that concentrations had not decreased and as required by the TARP and an investigation into the cause of the higher concentrations were undertaken by a hydrogeologist. The report concluded that the exceedance is not related to the current Marulan South Limestone Mine operation as no changes to operation were made in the last two years. A review of historical data, groundwater flowpaths and downgradient receptors also confirms this conclusion.




**Graph 7.9- MW04S Dissolved Iron**

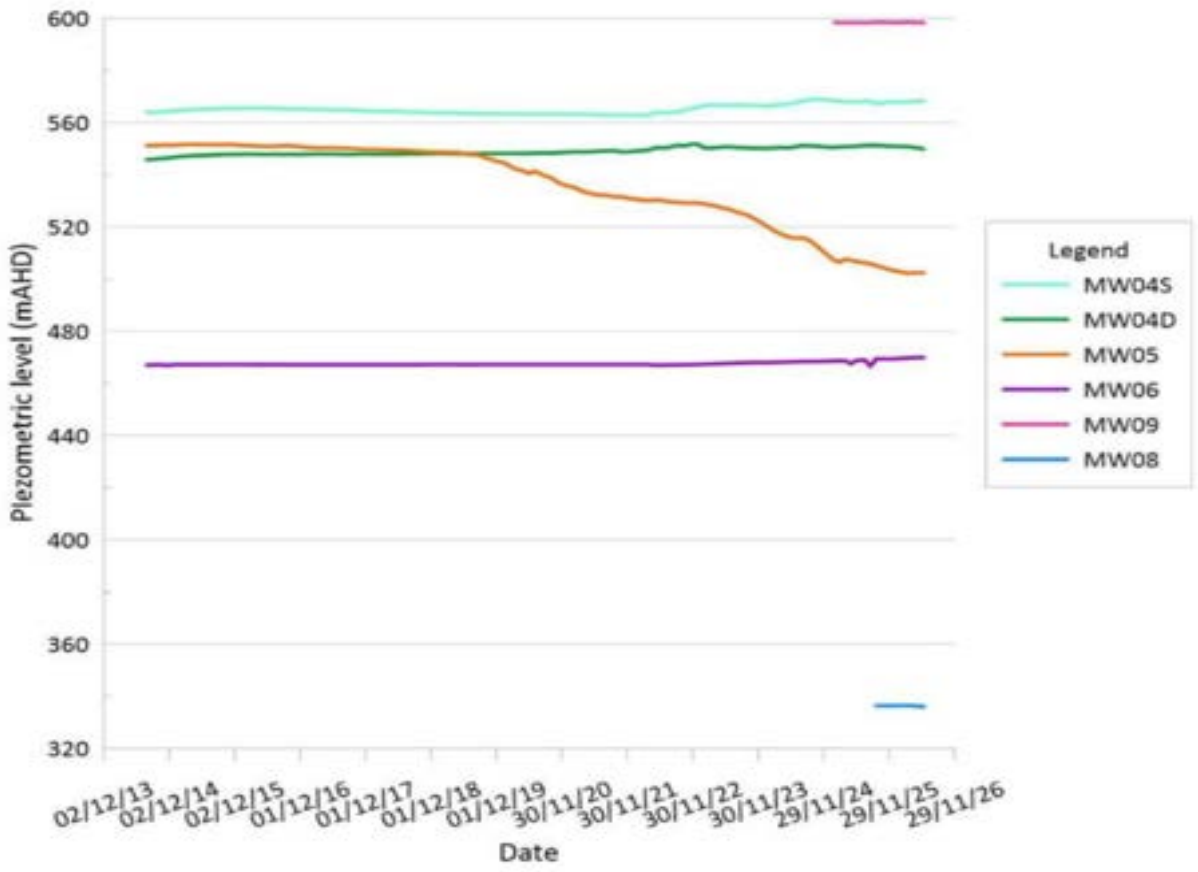
### 7.3.2 Groundwater Levels

Groundwater levels are recorded daily from monitoring bores using pressure transduced piezometers. The piezometers are downloaded quarterly in correspondence with water quality sampling and the recordings are cross checked with manual water level measurements.

Historical water levels of bores in the pit contrast strongly with those located outside pit. Bores located in the pit such as MW01 and MW02 (both of which are now discontinued) had rapid responses to rainfall and runoff that seeps directly through the limestone. As an alternative, the remainder of the bores outside of the pit do not show variation associated with rain events because such fluctuation is buffered by the regolith situated above the groundwater level. The standing water level in these bores has either been fairly static or increased slightly since 2014.

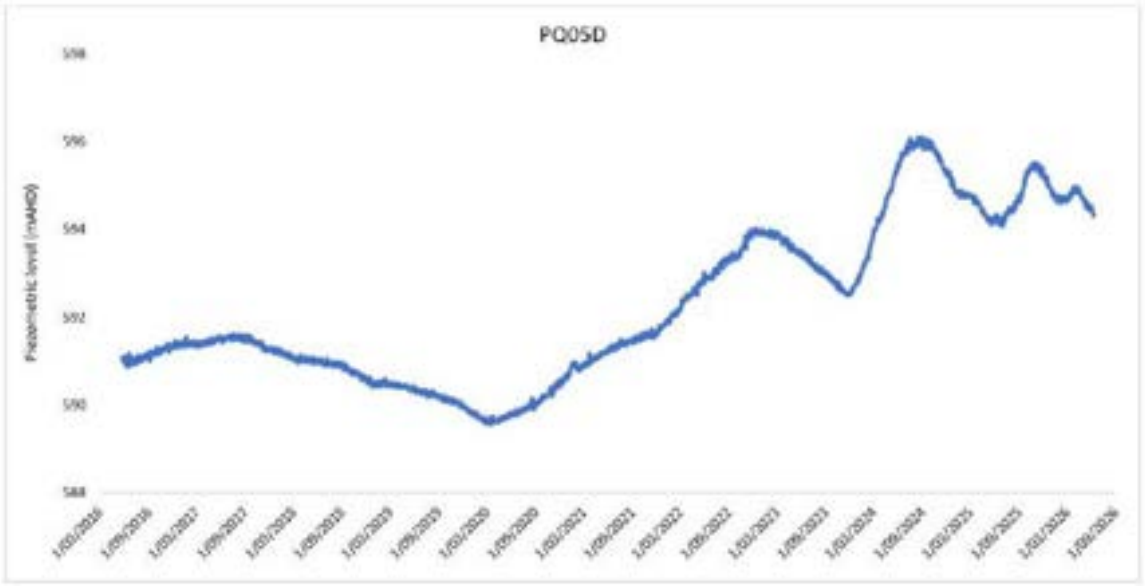
The standing water level in monitoring bore MW05 presents a gradual decline from March 2017 until May 2019, plateaued for 18 months from 2021-2022 and has accelerated again until present. It is becoming clear that MW05 has been impacted by the mine extraction. The decrease in standing water level observed at MW05 was expected based on groundwater modelling predictions of pit development. It is believed that the rapid decline was a result of the removal of the cross-cutting dolerite dyke in the North Pit which appeared to be 'damming' groundwater up-dip. Since the water level of this bore is artificially high (perched) it is also not reflective of the impact the quarry is having on regional groundwater levels. MW03 and MW04 are more accurate representations

of the surrounding granite groundwater systems which have not as yet been impacted by the limestone removal within the mine. Graph 7.10 below shows that bore levels as monitored since 2014.




**Graph 7.10 – Average Monthly Groundwater Levels from Monitoring Bores**

The WMP requires a comparison of groundwater levels with those recorded at the adjacent Peppertree Quarry. Graph 7.11 shows the hydrograph for bore PQ05D, a sentinel bore, which is located to the west of the hard rock quarry, north of the Mine. There is an increasing trend in standing water level evident similar to those of MW03S and MW04S resulting from prolonged wet periods. The hydrograph results for PQ05D demonstrates that this bore has some level of connectivity to surface recharge and is therefore a good indicator of regional groundwater movements.




Graph 7.11 – Peppertree Quarry PQ05D Hydrograph

The groundwater impact assessment conducted for the SSDA by AGE Consulting in 2019 does not predict any private bores will be impacted by drawdown greater than 1 metre during the 30-year SSD7009 consent period for the mine. The groundwater monitoring to date supports this conclusion.

### 7.3.3 Groundwater Model Review

The potential impact of the SSD7009 approved 30-year mining plan on groundwater was assessed by a numerical groundwater flow model which was prepared in accordance with the Aquifer Interference Policy. The assessment identified two risk areas. The first is the potential impacts on the quality and volume of groundwater flowing between the western mining area and the eastern Bungonia gorge system. The second is the potential risk to the water level at private bores located on the plateau to the west of the mine.

A model predicted that there will be only a minimal change in groundwater resources outside the limestone bodies following the mining project. The dolerite dyke running through the current north section of the northern pit is the only barrier identified to potentially prevent drainage in the future. The assessment also found that assuming no changes to the pit fractures, there will be a slight increase in recharge into the limestone from a larger overall mine pit area and increased flow into Bungonia Creek.

Condition of Consent B54(v) *"requires a program to periodically validate the groundwater model….including an independent review of the model every 3 years"*

In discussion with DPHI, it was clarified that the 3 year period would commence from the 1st January 2023 (date of commencement) with the first three year review due on the 1st January 2026.

AGE were commissioned to undertake the Validation of the model, where the focus was to determine whether modelled predictions matched site observations. It was identified that the model groundwater levels were good against observed groundwater levels at most sites. However, it was shown that the model was poor in a small number of areas. It was therefore recommended the model be updated and recalibrated with current operational site conditions and data.

As per the recommendation, Boral is updating the groundwater model and will have it available in the next reporting period. Further validation of the model will then occur at the end of the following 3 years after the update as per the Consent Condition.

### 7.3.4 Ground water Summary and Opportunities for Improvements

Assessment of groundwater monitoring data is undertaken six monthly after each round of water quality sampling. The assessment includes graphing the data to determine if trends are developing. Particular attention is given to MW05 bore which is a licensed monitoring point.

The assessment is undertaken in conjunction with the surface water monitoring and the River System Health assessment as described in the Groundwater Management Plan. A photographic record is kept for comparison and visual observations are compared to historical baselines observations and climatic conditions. Any ecological and environmental anomalies observed through ongoing ecological and environmental monitoring will be compared with the annual groundwater level data. Any significant variation or the appearance of adverse trends will trigger further investigation.

Routine groundwater monitoring at the mine seeks to identify any mine related impacts on the local aquifer systems. No specific groundwater monitoring is undertaken within the Bungonia Creek and Barbers Creek gorge due to the impracticality of installing groundwater monitoring infrastructure. The current quarterly monitoring program of groundwater levels coupled with six monthly water quality monitoring is sufficient to determine any potential trends in groundwater system changes as a result of the mine excavation. The groundwater monitoring program is also used to will identify any changes in stream and vegetation health which is an indicator of any impacts on Groundwater Dependent Ecosystems (GDEs) and general terrestrial and aquatic ecology.

Monitoring of the spring (also known as the Blowhole) is also covered in the Surface Water Management Plan. Spring flow is regarded as groundwater which becomes surface water in this case, and hence there is an overlap between surface water and groundwater monitoring. A photographic record of the Blowhole as well as quarterly water quality testing is documented. No changes to flow or water quality were recorded at the Blowhole in the reporting period, as discussed in the Surface Water Monitoring Report attached as Appendix D.

No alluvial aquifers are mapped along Barbers Creek, Bungonia Creek and the Main Gully southwest of the mine. The Shoalhaven River alluvial aquifers are situated outside the predicted zone of drawdown and not deemed necessary for groundwater monitoring.

The FY26 Annual groundwater review (refer Appendix 3) concluded

- Highest groundwater level is recorded in the west of the Mine, (MW04S and MW9) and lowest in the east (MW08 and MW06). This trend is as observed at the start of mining and is consistent with conceptual groundwater model. There is limited influence from extraction activities on groundwater.
- In MW05 bore which recorded depressurisation over the past 8 years piezometric level decrease appears to have slowed down and was 4 m during this monitoring period.
- MSLM does not have all bores installed in the same hydrostratigraphic unit, and same depth, however, the interpreted equipotential lines provide the regional groundwater flow direction. Interpreted groundwater flow is towards the east and southeast and unchanged from that reported in the GWMP (AGE, 2021).
- pH varied in all bores around neutral and within the historical range. The pH was only slightly below the 5th% in March 2026 for MW04S. In all other events and bores pH ranged within the trigger level;
- Groundwater is fresh to slightly brackish ranging from 550 to 3040 µS/cm. Overall recorded EC levels were slightly above last year but within the historical range.
- Spring flow and groundwater seepage monitored via Blowhole indicates that there had been no change in water chemistry over the past year. Similarly, baseflow chemistry monitored in Bungonia Creek indicates no change in water chemistry over the past period.
- No impact from the Quarry operations has been observed on the groundwater system, surface expression of groundwater and private bores.

- Water supply bores – no more than 2 m drawdown was observed at monitoring bores MW3D, MW4D, MW6, MW8 and MW9
- No regional or other Mine monitoring bores are impacted.

Monitoring and reporting will continue in the next reporting period with the Water Management Plan to be updated with revised Trigger levels.

### 7.3.5 Verification

A Trigger Action Response Plan is in place which forms the basis for ongoing assessment of potential groundwater impacts. The following key actions and responses will be undertaken if a trigger threshold is exceeded.

- The re-confirmed exceedances will prompt an investigation, conducted by suitably qualified personnel, to determine the reasons for the exceedance, which could include but not be due to the influence of climatic conditions, agriculture abstraction or mining activities.
- In the case exceedances are attributed to mining activities, changes in groundwater conditions, such as a decrease in water level or increase in salinity, will be compared to performance measures to evaluate the significance of any impacts on the groundwater system.
- Furthermore, the response and action to trigger exceedances in the TARP should determine if the trigger event resulted in an incident.

The results of the trigger investigations will be reported in each Annual Review. If it is clear each year that the groundwater baseline is changing in response to factors not related to mining such as climate or other land uses then the trigger thresholds will be recalculated. If this occurs the Ground Water Management Plan will be updated.

# 8 REHABILITATION

## 8.1 Rehabilitation Strategy

The Marulan South Limestone Mine has a progressive rehabilitation strategy which considers the continued 30 year SSDA mine operation. This Strategy was prepared for the site as required by the consent for the Continued Operations Project which was approved by DPHI on 16th September 2022.

The Strategy describes how Boral will build upon the rehabilitation objectives contained in CoC B76 to progressively achieve the mine site's rehabilitation outcomes.

This strategy applies to all land disturbed by the development. Land disturbed is characterized into a series

of mining domains or land management units with a discrete operational function for example, overburden emplacement, infrastructure or mine void etc. These domains are determined by the Resource Regulator.

To achieve the proposed Rehabilitation Strategy, a Rehabilitation Risk Assessment is undertaken and a Rehabilitation Management Plan prepared outlining the implementation of the works.

## 8.2 Rehabilitation Risk Assessment

The Rehabilitation Risk Assessment was prepared in March 2022 and has been reviewed in 2024, 2025 and 2026. In May 2026, a Targeted Assessment reviewing Landform Establishment was undertaken by the Resource Regulator. It was identified that the Risk Assessment required an update to ensure it meet the requirements of the relevant Guidelines. The Rehabilitation Risk assessment will be reviewed in the following reporting period and provided to the Resource Regulator. (refer Section 11).

## 8.3 Rehabilitation Objectives

The current rehabilitation strategy encompasses the following landform objectives across all rehabilitation domains.

As part of the Resource Regulator Targeted Assessment reviewing Landform Establishment conducted in May 2026, it was identified that the current Rehabilitation Objectives are no longer in line with the required guidelines. Boral have been requested to provide updated Rehabilitation Objectives to the Resource regulator for approval by the 30th November 2026.

## 8.4 Rehabilitation Management Plan

The Rehabilitation Management Plan was submitted to the Resources Regulator on the 29th December 2023, however following the Resource Regulator Targeted Assessment reviewing Landform Establishment in May 2026 it was identified that the current Rehabilitation Management Plan did not conform to the required Form and Way Guideline. Boral were therefore requested to review the Management plan and submit to the Resource Regulator for review by the 30th August 2026.

It was also recognised that the RMP will again be reviewed early in 2027 following the update of the Rehabilitation Objectives.

## 8.5 Rehabilitation of Disturbed Land

As part of the rehabilitation commitments to the Resource Regulator, an annual report is submitted outlining the works completed in FY26. A three-year Forward plan is also prepared detailing proposed works identified under the site mining domains stipulated by the Resource Regulator (refer section 8.7)

Appendix 1, Figure 4 shows the ground disturbance, and rehabilitation works as of June 30th 2026.

Table 8.1 details the disturbance and rehabilitation managed as per the active domains on the site and as shown on Figure 4.

Table 8.1 - FY26 disturbance and Rehabilitation progression

| Domain | Area in ha |
|---|---|
| Total Disturbance Footprint – surface Disturbance | 358.8 |
| Total active disturbance | 280.77 |
| Rehabilitation – land preparation | 10.85 |
| Ecosystem and land use establishment | 5.32 |
| Ecosystem and land use development | 61.87 |
| Rehabilitation completion | 0 |

The rehabilitation focus for FY26 was primarily on land preparation and management of weeds and pests within the Ecosystem and Land use development areas.
Land preparation areas were trimmed, battered and prepared for topsoil placement.
Management work was focused particularly on the management of Pampas grass. This weed has continued to be targeted in rehabilitation areas as well as throughout the pit and benches. -Spraying and confirmation of plant die-off has been undertaken via application of herbicides via drone and subsequent drone mapping of the results.

No planting was forecasted or undertaken for the FY26 year.

### 8.5.1 Seed Sources and Application

Seed spray trials conducted at the south-western end of the Western Overburden Emplacement during 2020 showed best results with Flexterra FGM with ryegrass and couch cover seed mix. This therefore has been selected from the trials and will be used to rehabilitate the remainder of the Western Overburden Emplacement area. To date, the seeding has taken well as a dense mat of clover is visible.

Limited topsoil spreading occurred during FY 26. Due to the location of ground disturbance, topsoil stockpiles were not easily accessible. Plans are in place for material to be spread in the FY27 reporting period.

### 8.5.2 Rehabilitation Activities

The site achieved a total of 10.85 hectares of land prepared for rehabilitation during the reporting period. Rehabilitation activities undertaken during the reporting period are detailed in the following sections.

During the reporting period, overburden continued to be emplaced in the WOE extension to Marulan South Road and the portion that has achieved final batter height is allocated as a topsoil storage area. Topsoil was stockpiled according to best practices and will be taken to the topsoil storage area where it will be spread on the next available rehabilitation batter.

### Southern Emplacement Rehabilitation Batters

During the reporting period a portion of the lower batter of the Southern Emplacement rehabilitation batters continued to be shaped and topsoiled, with groundcover established through the seedbank in the topsoil

### Bryce's Gully

The site-specific Bryce's Gully Rehabilitation Strategy was implemented in 2019. The general objectives for rehabilitation of the gully are to construct a geotechnically stable landform which does not present a greater safety hazard than the surrounding land; create land to be visually compatible with the surrounding natural landscape and to not negatively impact the visual amenity of the gully. The rehabilitation progression is monitored annually using EFA (See Section 8.6).

Works on the Gully are currently on hold.

### Barbers Creek

On March 30th, 2026, Global Soils undertook stabilization of the surface of the Barbers Creek slip area covering approximately 5.7ha with "Storm Guard" soil binding polymer containing a dryland seed blend and Mineral microbe fertilizer to encourage further vegetation growth.

### 8.5.3 Feral Animal Control

There continues to be habitat disturbance associated with feral animals including rabbits, brown hares, foxes, goats and more recently deer. During the reporting period feral animal control was undertaken via aerial culling by National Parks and Wildlife (NPWS) as well as a site arranged pest control professional. Game cameras and regular inspections inform the need and timing on the site pest management activities.

### 8.5.4 Weed Management

Three WoNS/state priority weeds, including 3 regional priority weeds, Blackberry, Serrated Tussock and Pampas Grass continued to be managed onsite in the reporting period.

We continued to use the services of an agricultural grade drone to spray the pampas grass on the benches of the pit. Blackberry Spraying was conducted at the end of the black berry season in April, and the rehabilitation areas were sprayed for pampas grass and seed heads cut off to prevent spread. Serrated tussock was treated in the FY26 reporting period around a number of areas across the site.

## 8.6 Rehabilitation Monitoring

### 8.6.1 Ecosystem Functionality Analysis

EFA monitoring is conducted annually in Spring with the 8th round of monitoring occurring in November 2025. This monitoring is conducted independently to Boral.

The EFA monitoring program is primarily designed to track rehabilitation progression, success over time and provide advice on further works to meet the designated completion criteria.
There are four transects established in rehabilitation areas, with one representative transect additional to this located in established bushland and creating a comparison reference point, R1 is located South-west of the Western Overburden Area (WOE).

Overall, the results show there has been an improvement in rehabilitation on the assessed sites, with the rehabilitation on most of the sites tracking toward the established objectives and criteria.

However, it was concluded ...

*"While the rehabilitation efforts are on the right track, further interventions are needed to accelerate ecosystem recovery, especially in the upper vegetation strata assemblage layers, which remain underdeveloped across many rehabilitated sites. These interventions may include planting additional native species, enhancing vertical vegetation structure, and continuing invasive species control to promote a more resilient and functional ecosystem. These actions can be implemented as natural gaps, such as those created by fallen Acacia, arise.*

In particular the following was advised …

*Site 2: ongoing of management of weeds. Allow acacia to die off with new emergent growth*
*Site 3: ongoing of management of weeds.*
*Site 4 : Adequate tree and shrub development are however in the early phase and will take some time to achieve sustainability. These foundations could be improved with brush matting and further native planting to aid establishment of the upper storeys. The success rate of tubestock planted in enclosures is currently 80% and have grown through the lids of the cages, which should now be removed.*

*Site 5: ongoing of management of weed"*

These findings and recommendations have been incorporated into the rehabilitation activities for the FY27 year.

### 8.6.2 Rapid Visual Assessment

The annual Rapid Visual Assessment was also undertaken in November 2025.

The RVA is a qualitative assessment method intended for rapid site-wide screening rather than detailed ecological analysis. It is effective for identifying visible disturbance and emerging threats.

Each RVA site is traversed on foot and assessed for the following: evidence of regeneration; presence of mine rubbish; evidence of grazing; presence of exotic weeds; presence of feral animal species; presence of domestic litter / rubbish; fire disturbance; presence of salvaged habitat and nest boxes; evidence of nearby maintenance activities; and surface stability and erosion.

The 2025 RVA identified that the key threats observed on site were related to extensive exotic plant cover, high threat and Priority weed infestations, the presence of mine rubbish and absent demarcation of the disturbance boundary footprint in key areas.

These findings will be addressed in the following reporting period and reviewed again in the RVA in November 2026.

## 8.7 Rehabilitation Summary, Forward plan and Opportunities for Improvements

As reported to the Resource Regulator, over the next three years the footprint of WOE will be consolidated with the emplacement of material in this area and the South pit.
A number of areas will remain within the Landform Establishment Rehabilitation phase with several moving into Growth Media Development. These areas will have topsoil spread directly onto the final landform at a depth of 300 mm with topsoil being sourced directly from new disturbance areas or from stockpiled material. These sites will be inspected regularly and regrowth assessed to determine if additional revegetation is needed.
Older sites already identified as Ecosystem phase and Land use Establishment will undergo infill planting where required with ongoing weed management across all areas.
Ongoing management of Barbers Creek Landslip will continue. Regular monitoring will continue with further application of polymer planned for FY 28/29, if required.

Ongoing monitoring of rehabilitation through the Rapid Visual Assessment, BAM and EFA assessments will be carried out to assess performance against the rehabilitation objectives. In the event that performance is not deemed satisfactory, remediation measures will be undertaken depending on the nature and extent of the problem.

# 9 COMMUNITY RELATIONS

The Marulan South Limestone Mine has been owned and operated previously by BCSC and now Boral Cement Limited since 1987 and continues to provide direct employment currently for approximately 95 local people who travel from the towns of Goulburn (35kms), Marulan (12kms), Berrima (60kms) and surrounding areas.

Services provided by Boral Cement include a contracted bus service for employees travelling from Goulburn. In addition, a helicopter landing station is maintained in support of emergency responses, which may occur on site or in the adjoining Bungonia National Park and State Conservation Area.

## 9.1 Environmental Complaints and Enquiries

The Quarry maintains an environmental complaint register that identifies actions required to resolve issues and concerns raised by the community. A 24-hour telephone complaints line is in place and advertised through the regular community newsletter and on the website. A list of the nature of any complaints is published to the Boral website on a regular basis. No complaints were received during the reporting period.

## 9.2 Community Liaison

Boral conducted a specific community liaison program as part of the SSD approval process in addition to its normal ongoing community engagement activities. The additional liaison provided information on community attitudes and concerns which assisted in the development of the ongoing mine operation strategic planning and environmental mitigation strategies.

The current engagement activities include:

- Regular community newsletters;
- Active participation in local events;
- Arranging site inspections and one on one consultation;
- Active engagement with key government and non-government organisations; and
- Maintenance of an environmental and community complaints register and actively managing and resolving community issues as they arise.

## 9.3 Community Consultative Committee

A Community Consultative Committee (CCC) has been established since 2011 in accordance with Condition A16 of Part A of the Project Approval. In 2021 DPE approved the joint CCC for the Marulan South operations, including both Marulan South Limestone and Peppertree Quarry, with the first meeting held in June 2022.

The CCC is comprised of:

- Two representatives from Peppertree Quarry including the Environment and Community Advisor;
- Two representatives from Marulan South Limestone Mine including the Environment and Community Advisor;
- One representative from Goulburn Mulwaree Council (Councillor); and
- Three Local Community Representatives

Independently chaired, the role of the CCC is to offer the Boral operations, input from the community perspective on matters of environmental performance and stakeholder relations. Meetings include the review of environmental data and any feedback provided to the site from local community members. Issues of concern can be raised with the site by the CCC representatives.

The timing of the meetings is determined by the CCC and generally undertaken at least 6 monthly. The CCC met two times during the FY26 year – October 2025, March 2026. Meetings occurred just outside the reporting period in both June 2025 and July 2026.

An Annual CCC report for 2065 has been prepared by the Chair (as per the Community Consultative Guidelines) and issued to the DPHI.

### 9.4 Community Involvement

Boral is engaged in local community events and has been involved in some of the most significant events since 2011. Boral is a proud major sponsor of the Tallong Apple Day Festival held annually in September and support a number of initiatives as follows...

- Tallong Apple Festival – Financial sponsorship and stall holder;
- Goulburn Mulwaree Council Community Bike ride
- Support for the printing of the Marulan Messenger local newsletter
- Printing of the Tallong newsletter
- Marulan Discretionary fund – Meeting and program support;
- Tallong Public School – Presentation Day and financial support in form of book voucher.
- Support of the Local Rural Fire Service

### 9.5 Access to Information

Boral has a number of websites for each corporate division. Marulan South Limestone has its own site at:

Boral Cement Marulan South Limestone Mine | Boral

The site contains all public information in relation to Statutory approvals and development activities.

## 10 INDEPENDENT AUDIT

In accordance with Condition D13, an Independent Environmental Audit (IEA) was required to be undertaken within one year of the SSD approval. The first IEA was conducted in March 2024 by EPS for the period from the 1 January 2023 to 31 December 2023.

A copy of the final audit report and a response to the recommendations was provided to the Department of Planning, Housing and Infrastructure as required.

The audit identified 2 non compliances and 8 Opportunities for Improvements.

All actions have been completed and /or being managed and were reported in the previous reporting period.

The next independent audit, as per Condition D13, will cover the period of the FY26 year.

# 11 REGULATORY REPORTING, INCIDENTS A& NON COMPLIANCES DURING THE REPORTING PERIOD

## 11.1 Incident Management and Response

In accordance with NSW EPA requirements, a Pollution Incident Response Management Plan (PIRMP) has been developed and implemented which details the:

- Risks and hazards associated with quarry operations, equipment and materials;
- Controls in place to reduce the risk in the occurrence of potential incidents;
- Inventory of pollutants and respective volumes stored on-site;
- Safety and incident response equipment;
- Communication strategy for the immediate notification of an incident to relevant government agencies and neighbours;
- Actions to be taken during or immediately after an incident; and
- Training and responsibilities of response staff.

The PIRMP was last reviewed and revised V16 in November 2025 and a copy can be accessed on the Boral website at:

https://www.boral.com.au/what-we-do/environmental-reporting

## 11.2 Summary of Regulatory Notifications

### SSD 7009 - DPHI

**A19: Surrender Consents dated 21 February 1972 to 16 October 1974**

Under SSD 7009 condition A19 "Within 12 months of the date of commencement of development under this consent, or other timeframe agreed by the Planning Secretary, the Applicant must surrender the existing development consents dated 21 February 1972, 16 October 1974, 13 February 1995 and 22 May 1997, April 2008, 20 June 2006 and 1 March 2012 as detailed in Section 3.3.4 of the EIS, and any existing or continuing use rights for the site, in accordance with the EP&A Regulation". Several of the consents have been surrendered, however delays have been experienced with those associated with Crown Lands. Discussions are continuing and DPHI have granted extension to the 30th Dec 2026.

**B88: Daily truck limit exceeded**

Under SSD 7009 section B88 a maximum of 75 laden trucks per day are allowed to leave site. One exceedance of the 75 truck per day limit was recorded on the 22nd April 2026, when 76 truck movements were recorded, 1 truck movement above the daily limit. The exceedance was reported to DPHI and the resulting action was to ensure all records were kept of truck movements from site. A review of the allocation of trucks was triggered and completed.

**B56: The Applicant must implement the Biodiversity Management Plan as approved by the Planning Secretary ongoing reporting to DPHI on the Closed catchment operations**

In February 2026, DPHI issued Boral with a Warning Letter for failing to comply with Schedule 2, Condition B56 of the consent by not implementing the approved Biodiversity Management Plan (BMP) namely the failure to undertake the rapid visual assessment of the closed catchment dam, in accordance with the BMP, in contravention of Section 4.2(1)(b) of the Act.

The Biodiversity Management Plan (BDMP) states that one Rapid Visual Assessment is required each spring in all remnant vegetation and rehabilitation areas. Since the date of the BDMP in October 2022 no RVA's have been made at the specific location of the Closed Catchment. This has now been rectified and will be addressed in subsequent RVAs.

In response to the management of the closed catchment Dam, two independent reports were undertaken – an Ecological and Water Assessment. DPHI requires a two monthly report on the status of the recommendations from those reports.

Two updates were provided to DPHI in the reporting period. The last report in the reporting period was the 13th June 2026.

Below are the actions as of June 2026 against the recommendations from the two reports.

**Table 11.1 RECOMMENDATIONS - ECOLOGICAL ASSESSMENT REPORT**

| | Measure | Description | Timing | Status |
|---|---|---|---|---|
| | **Short to medium term** | | | |
| 1 | Weed management | Update the Weed Management Plan to provide details of priority and high-threat weeds within the closed catchment and provide appropriate management strategies. Implement as recommended | By the end of 2025 | Complete. Weed management plan has been updated.<br>Strategies for management to be implemented.<br>Drone and Hand spraying are being undertaken as required |
| 2 | Consultation with<br>DCCEEW | Boral will consult with DCCEEW to determine a strategy for compensatory revegetation for the closed catchment. This will be informed by the updates to the Water Management Plan as proposed by EMM (2025). | Concurrently with consultation regarding the update to the Water Management Plan | Consultation with DCCEEW will be undertaken as part of the next planning step in seeking a modification for the long term management of the Closed Catchment. |
| 3 | Prepare Vegetation<br>Management Plans<br>(VMPs) | Prepare VMPs for:<br>• the management of vegetation within the closed catchment, including dieback areas; and<br>• management of an area of compensatory revegetation outside the worst-case inundation area (as determined during the update to, and approval of, the Water Management Plan | After endorsement of the proposed approach from NSW Planning. | VMPs will be prepared as required following the approved planning pathway. (Modification) |
| 4 | Annual review | The effectiveness of the management of vegetation under the VMPs will be reviewed annually. The outcomes of the review will be reported in the Annual Environmental Management Report (AEMR) | Annually as part of the AEMR process. | Noted. The annual review for FY26 published in September 2026 will report on the Closed Catchment. |

| | | | | |
|---|---|---|---|---|
| | **Long term** | | | |
| | Review strategy for compensatory revegetation. | Following completion of the Stage 2 WOE works, Boral will review the closed catchment water cycle to establish a preferred solution for closure planning that does not require active management (EMM 2025). A review of the strategy for compensatory revegetation will be undertaken at this time to ensure this reflects actual vegetation loss and revised inundation extents | five years after the completion of Stage 2 WOE works. | Not triggered for action |
| | closure planning | review progress towards completion criteria and update VMPs as appropriate to ensure criteria are attained | As part of mine closure planning | Not triggered for action |

**Table 11.2 RECOMMENDATIONS – INDEPENDENT WATER ASSESSMENT REPORT**

| | **Measure** | **Description** | **Timing** | **Status** |
|---|---|---|---|---|
| | **Medium term measures** | | | |
| 1 | Active management of Closed Dam water level (1a) | The Closed Dam water level will be actively managed via pumping to minimise the frequency and extent of Closed Dam inundation beyond the approved development boundary. Pump level triggers and capacities will be documented in the updated Water Management Plan | After approval of the updated Water Management Plan | Water levels continued to be managed through pumping of water and its use for dust suppression. |
| 2 | Closed Dam water level monitoring (1b) | A continuous water level meter will be installed and maintained in Closed Dam to monitor water levels | by the end of 2025 | A preferred option for continuous water level monitoring has been determined. Orders are to be placed with site installation arranged by Boral personnel. Installation is likely to take 3 months. |
| 3 | Consultation with DCCEEW (1c) | Boral will consult with DCCEEW to determine water licensing and approval requirements for the proposed management approach. | Consultation with DCCEEW will be undertaken as part of the Water Management Plan update | Consultation has been undertaken with DCCEEW as to the water licensing requirements. The advice was general in nature and as such Boral has now sought legal interpretation as to what is required.<br>Licensing requirements will be |

| | | | | |
|---|---|---|---|---|
| | | | | determined by June 2026.<br>Legal advice has been provided.<br>Water licensing provisions are to be arranged dependent on the water take required from the closed catchment. |
| 4 | Update Water Management Plan | Boral will update the Water Management Plan to incorporate Items 1 a), b) and c). The updated plan will include specifications for the pump-out system and a Trigger Action Response Plan (TARP) for the active management approach. | After endorsement of the proposed approach from NSW Planning | A drafted appendix to the Water Management plan has been prepared. EMM have been approached to provide a proposal for independent review of the updates. Once a review has been undertaken the WMP will be updated and provided to DPHI for approval. |
| | Annual review | Closed Dam water level monitoring data and the effectiveness of the management approach will be reviewed annually. The outcomes of the review will be reported in the Annual Environmental Management Report (AEMR) | annually as part of the AEMR process. | Noted. The annual review for FY26 published in September 2026 will report on the Closed Catchment |
| | **Long-term measures** | | | |
| | Water cycle review of Closed Dam | Following completion of the Stage 2 WOE works, Boral will review the Closed Dam water cycle to establish a preferred solution for closure planning that does not require active management. The review will be informed by Closed Dam water level monitoring and will consider a range of options including adjustments to the approved project boundary to account for the maximum predicted Closed Dam inundation extent. | Five years after the completion of Stage 2 WOE works | Not triggered for action |
| | Implementation of permanent solution | Boral will implement the preferred solution as part of closure works. | As part of mine closure planning and works | Not triggered for action |

## Environmental Protection License 944

**L3.2: Point 1 sample results are to remain within the set criteria of micrograms per cubic meter for a 24-hour period**

Point 1 in a 24-hour period the 100-percentile concentration limit is 25 micrograms per cubic meter and 50 micrograms per cubic for PM2.5 and PM10 respectively.

PM10 and PM2.5 samples taken at various times resulted in exceedances of the daily criteria.

8/1/26 PM2.5 result was 34.85 ug/m3 in 24hrs

8/1/26 PM2.5 result was 34.85 ug/m3 in 24hrs.

27/1/26 PM2.5 result was 38.99 ug/m3 in 24hrs.

27/1/26 PM10 result was 56.08 ug/m3 in 24hrs.

29/1/26 PM2.5 result was 34.88 ug/m3 in 24hrs.

29/1/26 PM10 result was 100.72 ug/m3 in 24hrs.

11/4/26 PM2.5 result was 51.85ug/m3 in 24hrs

17/4/26 PM2.5 result was 38.1 ug/m3 in 24hrs

The other samples over the year were below the criteria.

The monitor locations are not representative of the boundary (as required by the Consent and EPL) and once interpolated to the boundary, the results are within the criteria.

The EPA has agreed to the relocation of the High-Volume Air Samplers and DPHI approval is pending.

## EPBC

There have been three non-compliances with the Conditions of EPBC 2015/7521, Part A Condition 3 – B56, Part B Conditions 9 and 10.

A non-compliance has been identified against Part A, Condition 3 of the EPBC approval. This condition requires compliance with specified State Development Consent conditions, including Condition B56. As identified above DPHI issued a warning letter identifying a noncompliance with B56, therefore triggering a noncompliance with Part A , Condition 3.

Two non-compliances were identified against Part B, Conditions 9 and 10, which require notification and reporting of non-compliances associated with the EPBC approval.
During preparation of the EPBC Annual Compliance Report, Boral identified this oversight and recognised that the non-compliance against Part A Condition 3 should also have been reported to DCCEEW.

Formal notification has been issued to DCCEEW as of the 1st May 2026.

There were no non-compliances associated with biodiversity management, vegetation clearance, or rehabilitation activities within EPBC-controlled areas.

## Resource Regulator

On 13 May 2026, a Targeted Assessment on Landform Establishment was conducted at the Marulan South Limestone Mine by Resource Regulator Officers. The assessment focused on how the final approved landform is being established to achieve sustainable rehabilitation outcomes. The assessment reviewed the Rehabilitation Risk review, the Rehabilitation Management Plan, long-term stability management and erosion control.

Boral are required to undertake a number of actions as listed in Table 11.3 which are due in the next reporting period.

Table 11.3 Landform establishment targeted assessment actions

| Action # | Action | Due date |
|---|---|---|
| 1 | Review and update the Rehabilitation Risk Assessment to ensure it covers risks and uncertainty (or knowledge gaps) | 30 August 2026 |
| 2 | Undertake a review of final landform design and design acceptance criteria of the final pit design as well as the Southern (in-pit) dump design.<br>Develop the design acceptance criteria in accordance with the approved Rehabilitation Objective for landform stability for the mine | 30 August 2026 |
| 3 | Review and update the RMP in accordance with the 'form and way' for the Rehabilitation Management Plan for large mines | 30 August 2026 |
| 4 | Undertake revision of spatial data associated with the mines Final Land use and Rehabilitation Plan (FLRP) for waste lime material and Barbers Creek Slip | 30 August 2026 |
| 5 | Update the rehabilitation completion criteria in accordance with the Guideline: Rehabilitation objectives and rehabilitation completion criteria | 30 November 2026 |
| 6 | Review the timeframes for the remediation of the Barbers Creek emplacement landslip area, to determine if this area can be remediated in a shorter time period | 30 November 2026 |
| 7 | Review landform design practices and determine opportunities to use geomorphic design principles to optimise emplacement rehabilitation landform design (primarily emplacements | 30 November 2026 |
| 8 | Undertake collection of actual erosion field parameters (e.g. soil loss and movement) to facilitate erosion model refinement and development, and to validate the landform design performance over an extended period of time | 31 May 2027 |

## 12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The activities proposed to be undertaken during the FY2027 reporting period are presented in Table 12.1. The activities have been selected and prioritized based on:

- Internal and Independent Audit findings and recommendations;
- Operational requirements; and
- Continual improvement objectives in accordance with Boral's Environmental Policy and integrated HSEQ management System.

**Table 12.1 Proposed Activities in 2026 AR Period**

| Proposed Activities in FY2027 | Objectives |
|---|---|
| Undertake progressive Overburden stabilization and rehabilitation in line with the 3-year Forward plan and implement recommendations of the 2026 Rapid Visual Assessment and Ecological assessment | • Minimise erosion and sediment runoff<br>• Move towards achieving biodiversity management plan goals of establishing vegetation corridors |
| Review and/or prepare management plans as per approval requirements following approval of AEMR, modification approval and independent audit recommendations | • Document management protocols for quarry operations |
| Undertake annual Rehabilitation Rapid Visual Assessment (November 2026) | • Move towards achieving biodiversity management plan goals of establishing vegetation corridors |
| Undertake 2 yearly Ecological assessment (November 2026) | • Move towards achieving biodiversity management plan goals of establishing vegetation corridors |
| Implement Stakeholder Engagement plan for FY2027 | • Ongoing Community engagement |
| Undertake actions as required by the Resource Regulator in response to the Landform Establishment targeted Assessment | • Long term rehabilitation |
| Continue to report and progress actions for the management of the Closed catchment dam | • Surface water management<br>• Biodiversity management |
| Progress Relocation of air monitoring sampling locations to boundary locations | • Air quality management |
| Complete groundwater modelling review and update and submit to DPHI by December 2026 | • Ground water management |
| Review Water Management Plan in line with DPHI RFI | • Overall site water management |
| Manage Coolumburra Stewardship in line with management plan | • Biodiversity management |
| Arrange Return Aboriginal Artefacts to country with AHMC representatives | • Preservation of Aboriginal Cultural Heritage |

# APPENDIX 1

## FIGURES

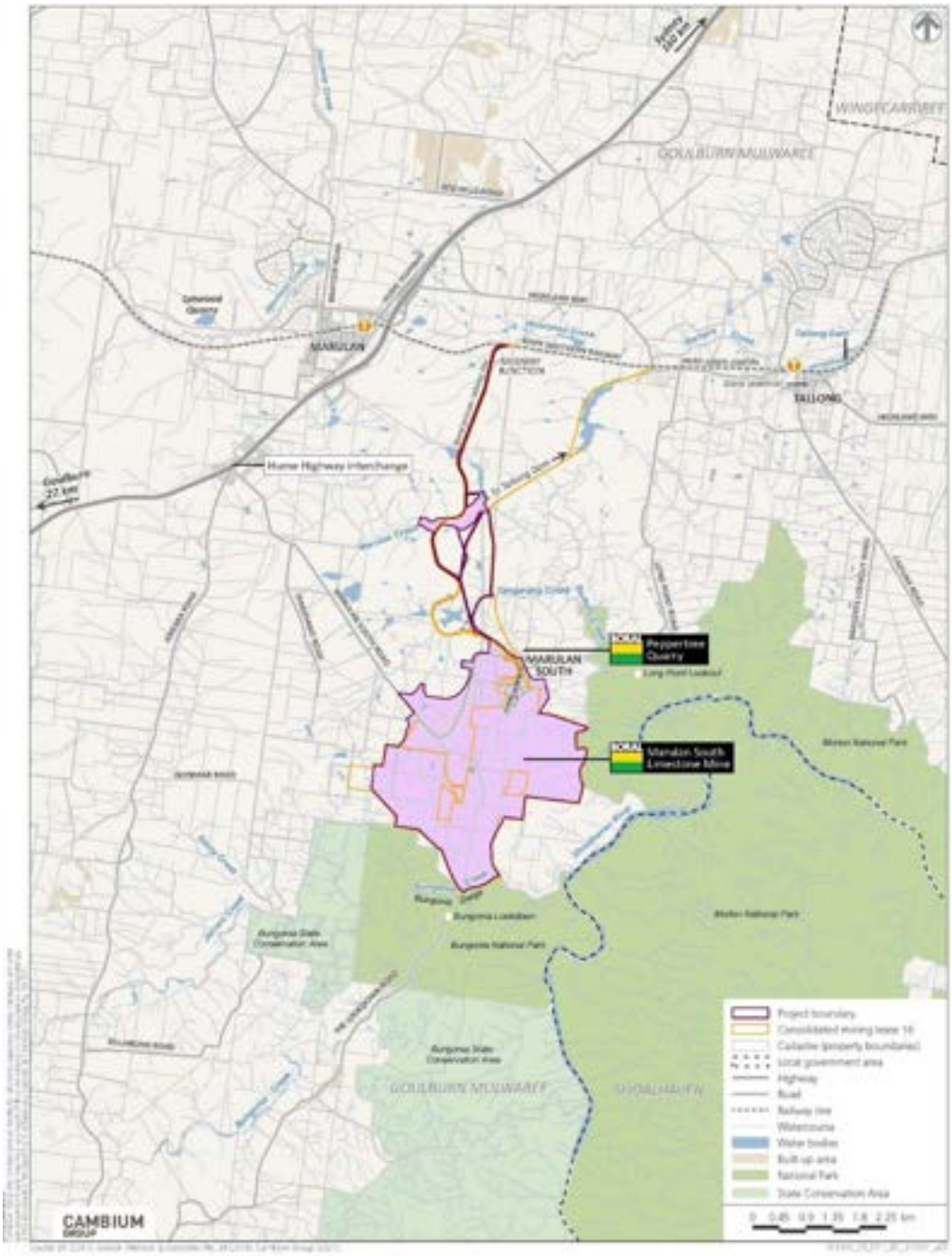



Figure 1 – Regional Location

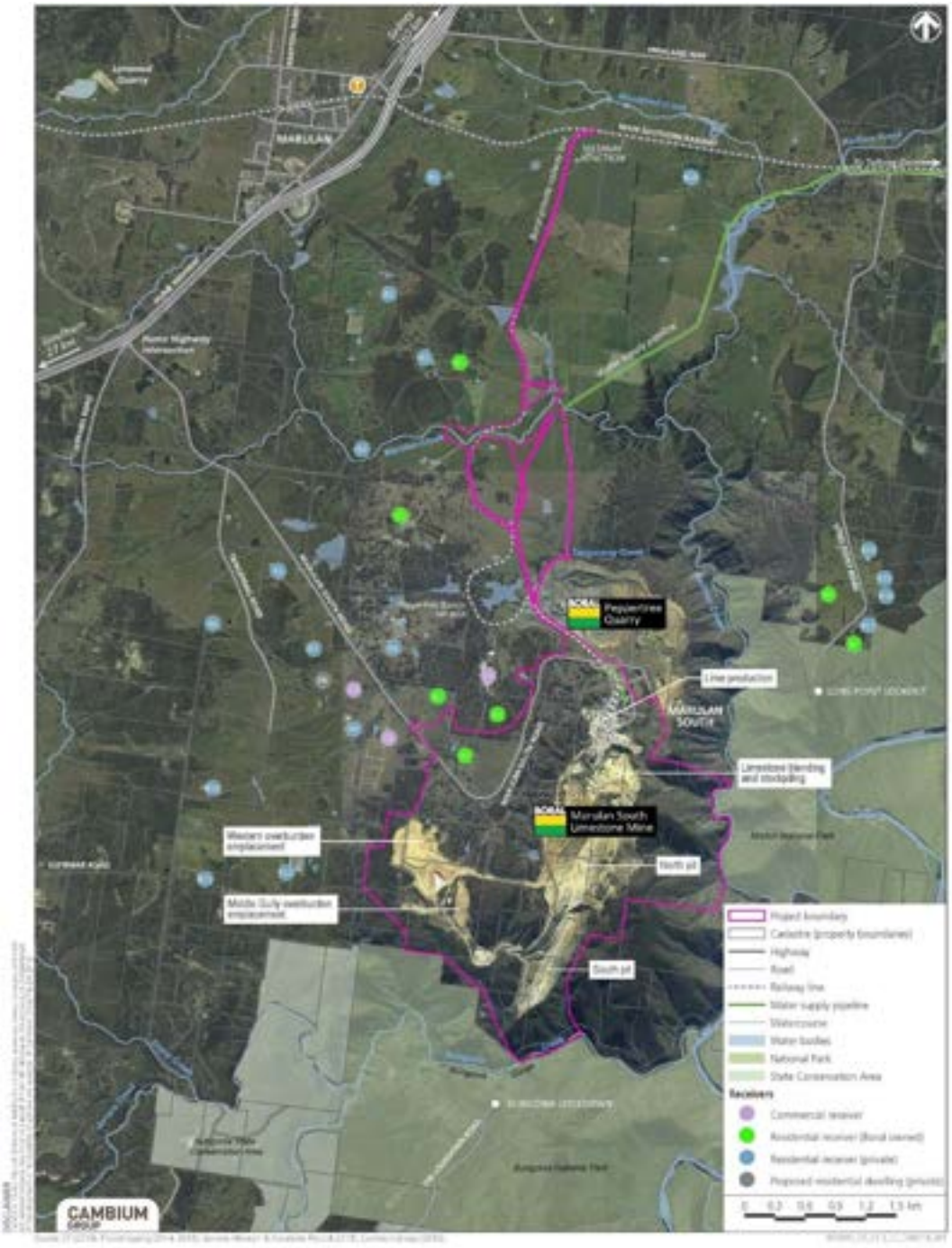



Figure 2 – Local Context

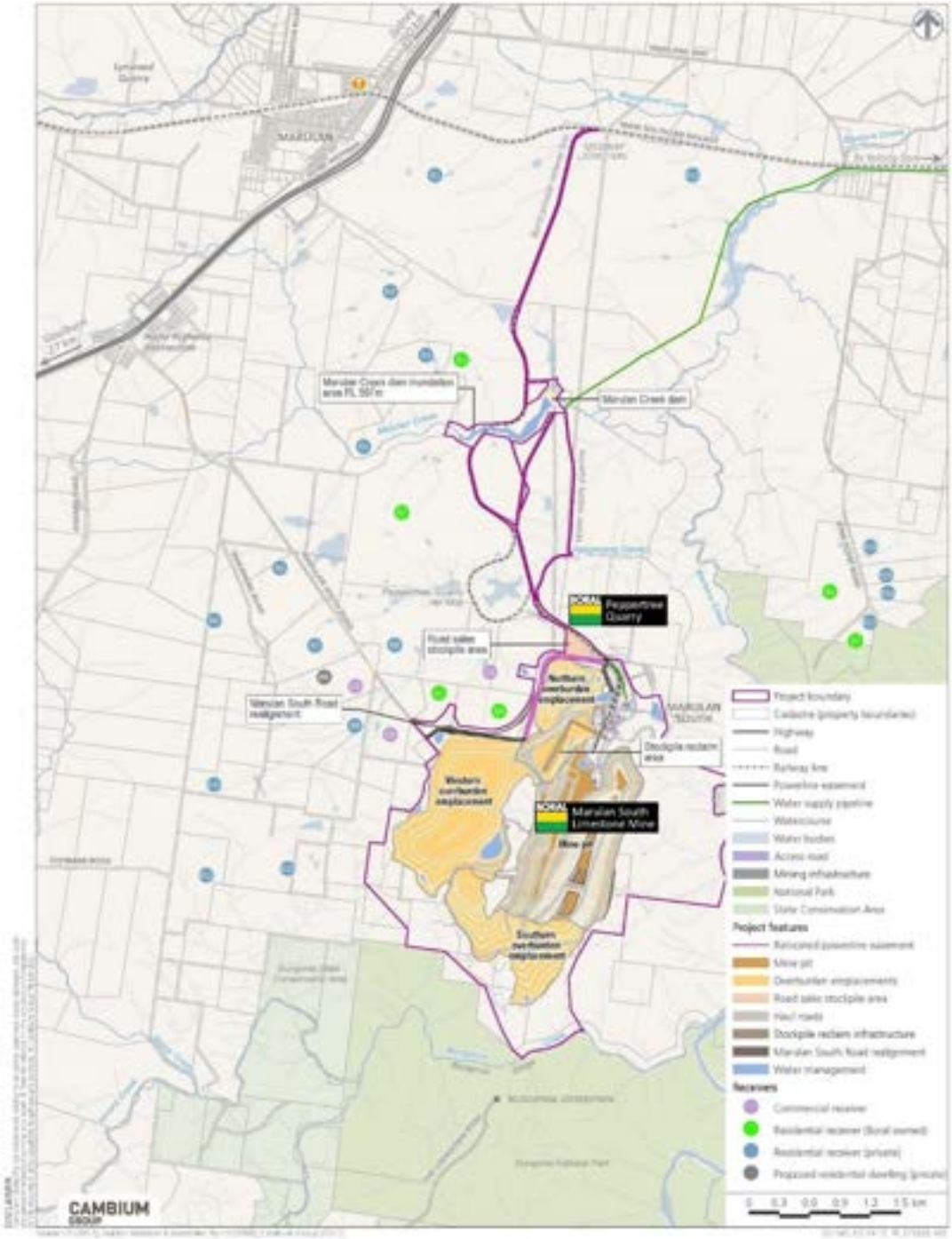


Figure 3 – Approved Project

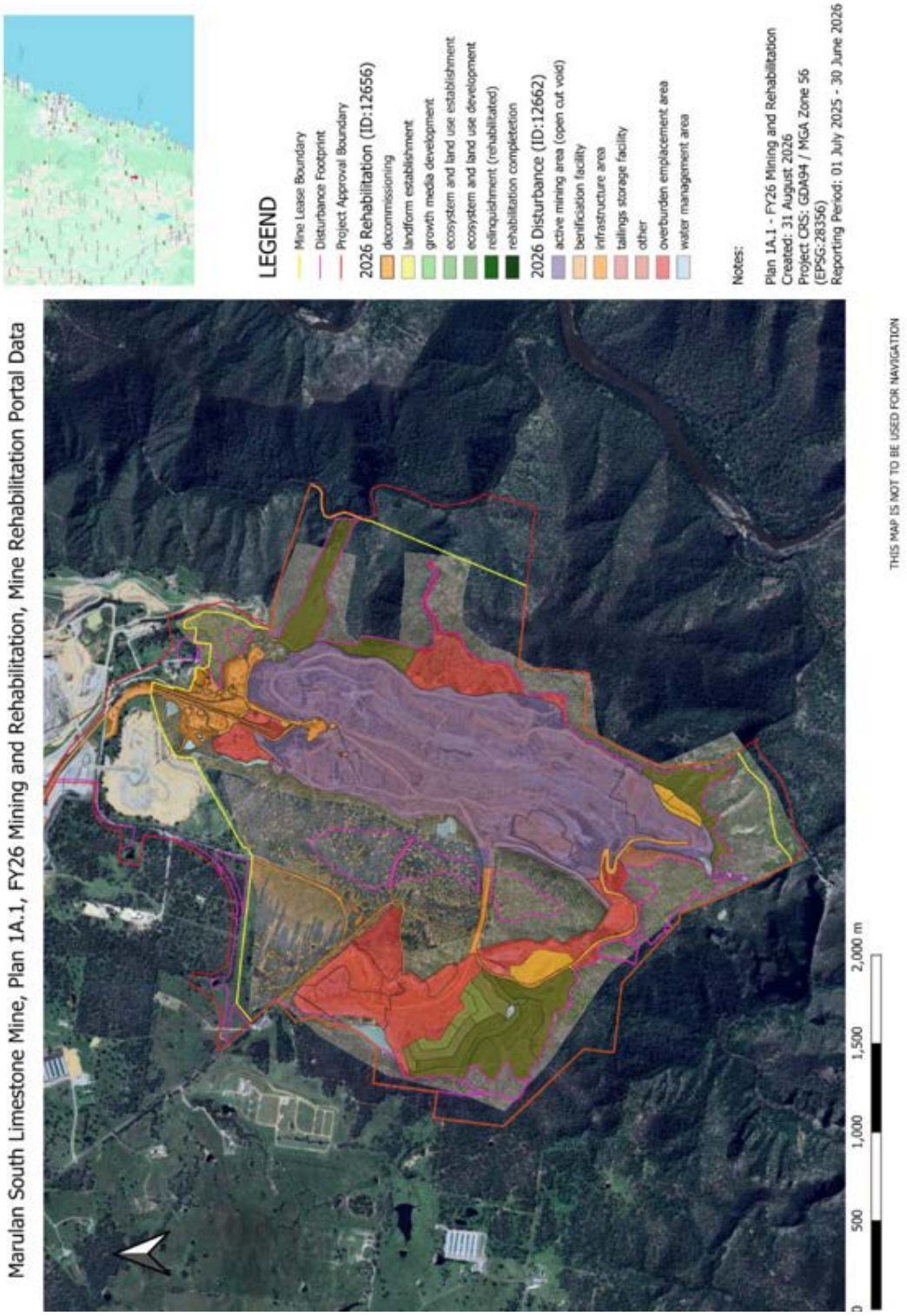


Figure 4 Disturbance areas FY26

# APPENDIX 2

## SURFACE WATER MONITORING AND RIVER HEALTH

# Marulan South Limestone Mine
# Surface Water Monitoring and River System Health
# June 2026



Prepared By:
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**Appendix A** - Site Photographs

# 1. Introduction

## 1.1 Background and Project Context

This report has been prepared by International Environmental Consultants Pty Limited (IEC) in response to conditions listed in Marulan South Limestone Mine State Significant Development approval SSD7009. Specific conditions include the Water Management Performance Measures listed in Table 4 Condition B43, Condition 45(e)(iii), Condition 45(e)(iv), Condition 45(e)(vi), and subsequent commitments made in the 2021 Water Management Plan.

The project involves ongoing limestone extraction within the Bungonia region of the Southern Tablelands, New South Wales. The site is located adjacent to sensitive watercourses, including Barbers Creek and Bungonia Creek, which are tributaries of the Shoalhaven River. These streams and the receiving Shoalhaven gorge are valued for their ecological function, geomorphic integrity, and recreational significance.

Under the 30 year mine plan, there would be two main sources of water release from the mine that have the potential to impact channel morphology, aquatic habitat, and stream health:

- Occasional overflow from sediment dams in the event of rainfall in excess of their design capacity.
- "Clean" runoff from rehabilitated overburden emplacement areas following completion of mining.

The standard of treatment proposed for release would provide water that is better than, or comparable to, the water quality in the receiving environment (Advisian 2018). No adverse water quality impacts are expected on Tangarang Creek, Main Gully, Bungonia Creek, Barbers Creek, and Shoalhaven River and that no impacts are anticipated on downstream users or on aquatic fauna (Advisian 2018, Niche 2018).

This report has been prepared to describe the existing hydro-geomorphic condition of the study streams, outline the monitoring framework, present an assessment of potential and observed impacts from mining operations on receiving waters and to verify the impact predictions contained in the SSD EIS and subsequent management plans.

## 1.2 Study Objectives and Scope

The primary objectives of this investigation are to:

- Document baseline fluvial, geomorphological, and surface water characteristics of Barbers Creek, Bungonia Creek, and the Shoalhaven River in the vicinity of the mine.
- Establish a monitoring framework to detect changes in water quality, geomorphic condition, and stream health attributable to mining operations.
- Analyse monitoring results to identify trends in hydrology, sedimentation, and channel morphology.

The scope of this report is limited to the catchments and receiving waters potentially affected by the mine, with a focus on tributary inputs and confluence dynamics. Broader catchment processes of the Shoalhaven River are acknowledged but not assessed in detail.

## 1.3 Catchments and Receiving Environments

The study area lies within the upper Shoalhaven River catchment in the Southern Tablelands of New South Wales (Figure 1). The Shoalhaven River is a major coastal river system that drains to the Tasman Sea via the Shoalhaven estuary. In the vicinity of the mine, the river flows through a deeply incised gorge system, confined by resistant sandstone and limestone bedrock. This gorge reach is characterised by alternating rapids, deep scour pools, and narrow inset benches that represent the main depositional environments.

Barbers Creek Barbers Creek is a small, steep tributary that drains directly from the limestone mining area into the Shoalhaven River. The catchment is relatively small and highly responsive to rainfall, producing rapid rises and recessions in flow. The channel alternates between bedrock-controlled sections and short alluvial pockets containing riffle–pool sequences and inset benches. Its small size and proximity to the mine make Barbers Creek particularly sensitive to changes in runoff and sediment inputs.

### 1.3.1 Bungonia Creek

Bungonia Creek drains a broader limestone plateau to the south and east of the mine and enters the Shoalhaven River through a narrow slot canyon within Bungonia National Park. The creek is almost entirely bedrock confined, with a series of plunge pools, cascades and short riffles. The confined nature of the valley limits natural sediment storage, meaning that additional sediment inputs are readily conveyed to the Shoalhaven River.

### 1.3.2 Shoalhaven River

Shoalhaven River in the study area is a bedrock-confined gorge system situated downstream of the Bungonia and Barbers Creek confluences. While the river has limited floodplain development in this section, it does contain discontinuous inset benches and bar deposits that are sensitive to increased sediment supply from tributaries. The Shoalhaven River downstream of these confluences is an ecologically significant waterway, supporting aquatic habitat diversity, riparian vegetation, and recreational values.

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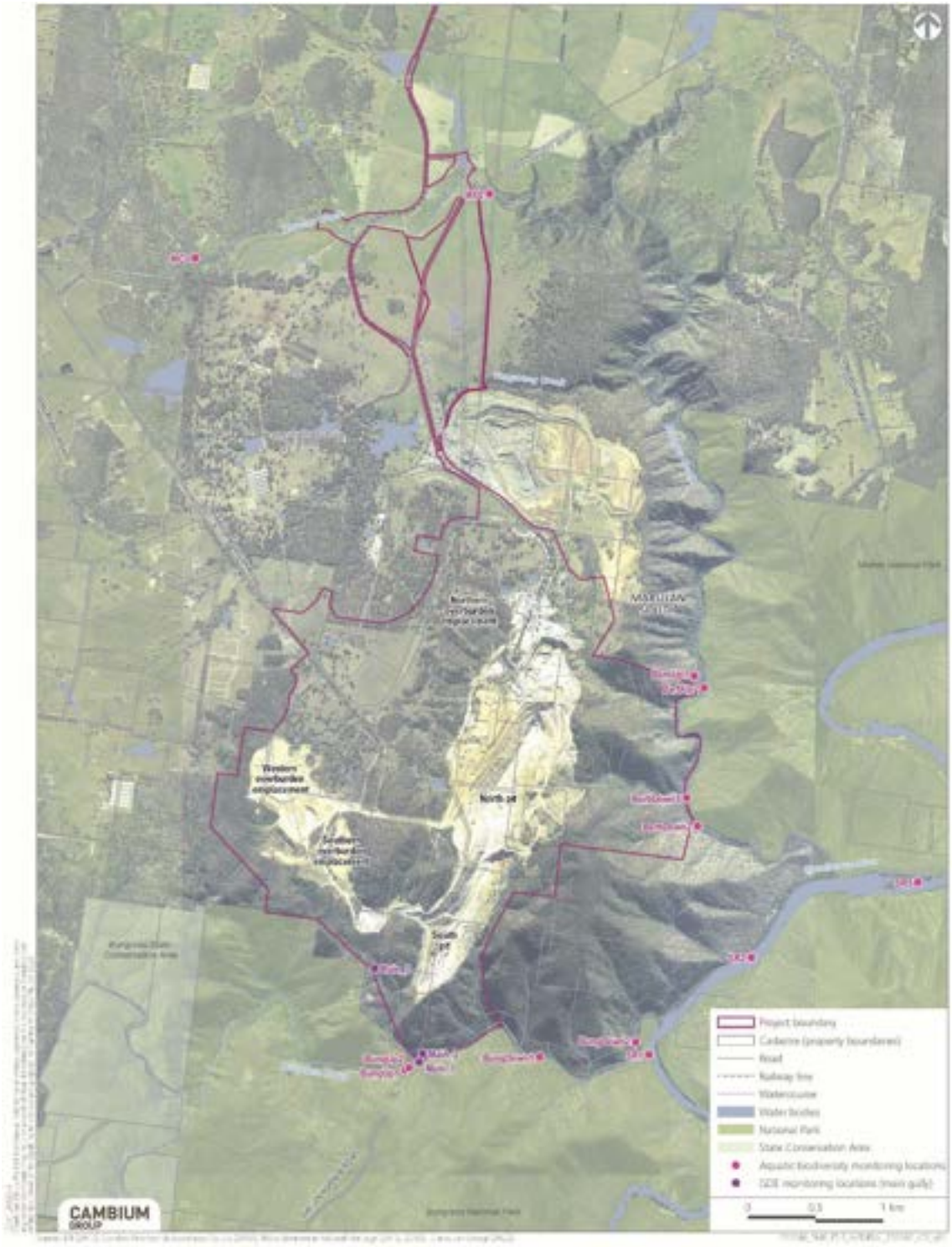



**Figure 1 – Monitoring Sites**

# 2. Surface Water Monitoring Program

This section details the surface water monitoring program which has been designed to identify any potential impacts caused by the limestone mine as well as general river system health.

## 2.1 Fluvial System

Barbers Creek features a steep-sided gorge extending approximately 8 km before it joins the Shoalhaven River, located east of the mine site. This stretch consists of a rocky, boulder-strewn channel with numerous rock pools and a gradient ranging from 5% to 6%. At its confluence with the Shoalhaven River, the catchment area is approximately 90 km². Vegetation along the creek's banks includes a diverse range of ferns, Casuarinas, sandpaper figs, and native grasses such as snow grass and *Lomandra* (see Plates 1 and 2, Appendix A). Black She-oak is also present but less common than along the Shoalhaven River.

A tributary originating from the Eastern Batters flows into Barbers Creek and is currently being monitored (see Plate 9). This site is located between the upstream and downstream monitoring points on Barbers Creek. An additional water sample is also collected directly upstream of the tributary for comparison. Since monitoring began in December 2022, there has been no observed change in Barbers Creek's water flow, quality or sediment characteristics. The tributary exhibits higher salinity and lower redox potential, while dissolved oxygen (DO) and pH levels remain similar to those of Barbers Creek (see Section 2.3.1).

Bungonia Creek is characterised by a steep-sided gorge containing a rocky, boulder-strewn channel that extends approximately 8.5 km upstream from its confluence with the Shoalhaven River. The upstream and downstream water quality monitoring sites are strategically located on either side of the Main Gully confluence. Within this section, the creek exhibits a longitudinal channel slope of approximately 4%. The contributing catchment area is approximately 275 km²—over three times the size of Barbers Creek—resulting in significantly greater hydrological capacity during high rainfall events. Under such conditions, the creek is capable of mobilising both fine and coarse sediments, as well as large boulders, indicating a highly dynamic sediment transport regime.

Riparian vegetation along Bungonia Creek is broadly similar in composition to that of Barbers Creek (refer to Plates 3 and 4, Appendix A). The banks support a dense assemblage of ferns and climbing species, as well as extensive stands of Casuarinas, native figs, and grass trees (*Xanthorrhoea* spp.). The surrounding gorge vegetation is dominated by a range of Eucalyptus species, including *Eucalyptus tereticornis, E. melliodora,* and *E. macrorhyncha*, which contribute to the structural and ecological complexity of the catchment.

Main Gully is a natural drainage line which, prior to mining activities, drained a catchment area of approximately 230 hectares and functioned as the primary surface water conveyance feature for the southern portion of the site. However, ongoing expansion of the mine void has significantly reduced the contributing catchment, resulting in minimal surface discharges. Presently, Main Gully functions as an ephemeral drainage feature with infrequent flow events.

The designated Main Gully monitoring location is situated on the southwestern margin of the South Pit. From this point, the drainage line continues in a northerly direction before ultimately

discharging into Bungonia Creek just downstream of the upstream Bungonia Creek monitoring site.

Located downstream of Main Gully is a notable hydrogeological feature referred to as the "Blowhole" (Plate 5, Appendix A). This feature represents a perennial groundwater seep or spring, emerging below the elevation of the South Pit and independent of surface runoff processes. The Blowhole's discharge is exclusively groundwater-derived and is therefore not considered representative of surface water quality conditions. Nonetheless, it contributes to baseflow within Bungonia Creek and can influence downstream water quality. Water quality samples are routinely collected at the lower extent of the Blowhole, immediately prior to its confluence with Bungonia Creek, to assess its influence on the receiving environment.

At the confluence with Barbers Creek, the Shoalhaven River drains a substantial catchment area of approximately 4,400 km². Between the confluences with Barbers Creek and Bungonia Creek, the river exhibits a broad, low-gradient channel flanked by sandy alluvial banks, which are sparsely vegetated with *Casuarina cunninghamiana* spp. The geomorphic characteristics of these sandy banks suggest that this section of the Shoalhaven River experiences significantly lower flow velocities relative to the steeper, higher-energy regimes of Barbers and Bungonia Creeks (refer to Plates 6–8, Appendix A).

Water quality data indicate that the Shoalhaven River contains markedly lower salinity levels than either of the two tributary creeks. Parameters such as electrical conductivity (EC), total dissolved solids (TDS), and overall salt concentrations are consistently lower, as documented in Tables 1 and 2 below.

A high-magnitude rainfall event in August 2020 had a pronounced geomorphic and ecological impact on the Shoalhaven River. Elevated flow volumes during this event extended 20–50 metres laterally across the floodplain, resulting in the uprooting of shallow-rooted *Casuarina* trees and widespread erosion of the sandy banks. Several affected zones, particularly at the upstream monitoring location 'SR1', remain unvegetated and exposed to ongoing erosion processes (see Plate 6d for visual documentation of the 2020 event impact).

There has been no change to the geomorphology of the Shoalhaven River for several years, and no evidence of any impacts from the mine.

## 2.2 Program Design

The monitoring program has been designed to detect changes in water quality and geomorphic condition that may result from mining operations, with reference sites upstream of the mine influence and impact sites downstream of the mine. The program has two main components, the first is the collection and testing of water quality within the receiving waters while the second is a visual inspection of the riverine vegetation health and photographic record of stream morphology.

Monitoring is structured around three interrelated components:

- Water Quality Monitoring – targeted at detecting changes in turbidity, suspended solids, and other key water quality parameters.
- Geomorphology Monitoring – focused on channel form, sediment storage, pool–riffle structure, and confluence dynamics.

- Stream Health Indicators – assessing broader ecological function through habitat condition, riparian stability, and physical diversity of aquatic environments.

This structure provides both quantitative metrics and qualitative assessments, allowing early detection of potential impacts and supporting adaptive management.

### 2.2.1 Water Quality Monitoring Program

The monitoring program has been designed to enable the assessment of impacts, both positive and negative, on the receiving waters over the long term. To achieve this, the monitoring and observation sites include both upstream and downstream of the mine in each of the creeks that the mine could potentially impact. This includes:

- Barbers Creek Upstream and Downstream sites, referred to as Barbers Up and Barbers Dn. This creek system is fed by a number of minor tributaries which drain the eastern side of the mine including the Bryces and Barbers Emplacements. Both these emplacements have been previously rehabilitated but due to their steep nature can erode and produce sediment which is deposited in the tributaries of Barbers Creek.

- Bungonia Creek Upstream and Downstream, referred to as Bungonia Up and Bungonia Dn. This is a significant tributary to the Shoalhaven River and flows along the southern boundary of the mine. Between the upstream and downstream sites are the Southern Western Batters area which has previously been rehabilitated but has the potential to be a source of sediment and similarly the clean water drainage discharge from the Western Overburden Emplacement area. The clean water drainage system flows down Main Gully but can also be a source of sediment during extreme rainfall events due to natural erosion of the bed and banks and potential overflows from dirty water areas. Main Gully is equipped with an automatic water sampling site.

- The Blowhole site is located above the confluence of Main Gully and Bungonia Creek. It is a natural spring which is sourced from the limestone deposit below the extraction area. It is a point where groundwater discharges to surface water and joins Bungonia Creek between the upstream and downstream sampling sites. Being groundwater derived, the water quality is significantly different from the surface water of Bungonia Creek and has often been observed with an orange sediment present (Plate 5 in Appendix 1).

- Upstream and downstream of the main receiving waters of the Shoalhaven River. There is also a mid point sampling site as well. These sites are referred to as SR1 (Upstream Site), SR2 (Mid Site) and SR3 (Downstream Site). The Shoalhaven River is considered the final receiving waters for the mine.

Samples are taken on a quarterly basis and tested for a range of physical and chemical parameters. These include pH, conductivity, suspended and dissolved solids, dissolved oxygen, alkalinity, hardness, cations and anions. These parameters provide an overall indication of river health and can be used to compare the results with other typical river systems. Additional tests are undertaken to determine if there are any specific stressors within the river system. This includes the metals Aluminium, Beryllium, Barium, Cobalt, Copper, Manganese, Molybdenum, Nickel, Selenium, Strontium, Vanadium, Zinc, Boron, and Iron. Heavy metals including Mercury, Lead, Chromium, Cadmium, and Arsenic are also included.

Nutrients are also included in the testing regime in order to complete the river health assessment. These include Nitrogen compounds, Phosphorus, Sulphate and Potassium. These compounds are typically associated with pollution from agriculture and manufacturing processes.

### 2.2.2 Stream Geomorphology

Geomorphic monitoring is designed to identify changes in channel condition and sediment dynamics attributable to quarry runoff. The program includes visual assessment of waterways at each monitoring site at the time of collection of water samples. Records of quarterly photographs at each location can then be used to determine any long term changes that may occur. The records include:

- bank and bed stability;
- level of sedimentation;
- evidence of active erosion;
- vegetation health and vigour.

The visual assessment and photographic records are compared with historic results on a quarterly basis. Additional information is recorded if considered necessary based on any sudden changes that may have occurred between quarterly inspections. This may include high rainfall events or continuation of an extended dry period.

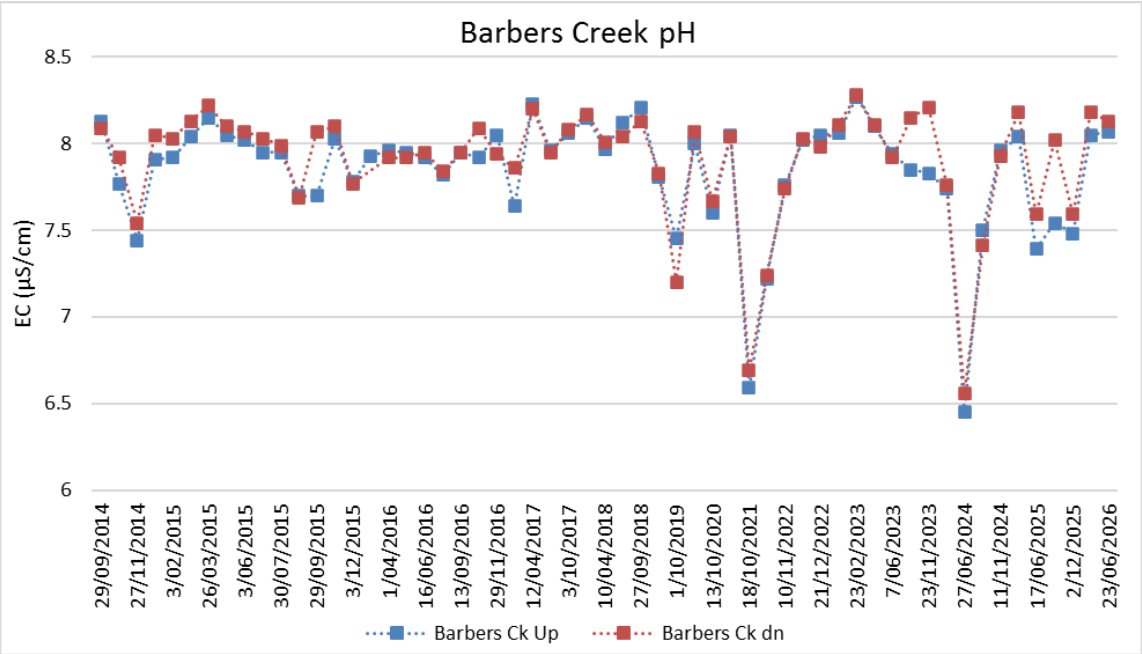
## 2.3 Program Results

The following section provides the results of the monitoring program up until the June 2025 reporting period.

### 2.3.1 Barbers Creek Water Quality Results

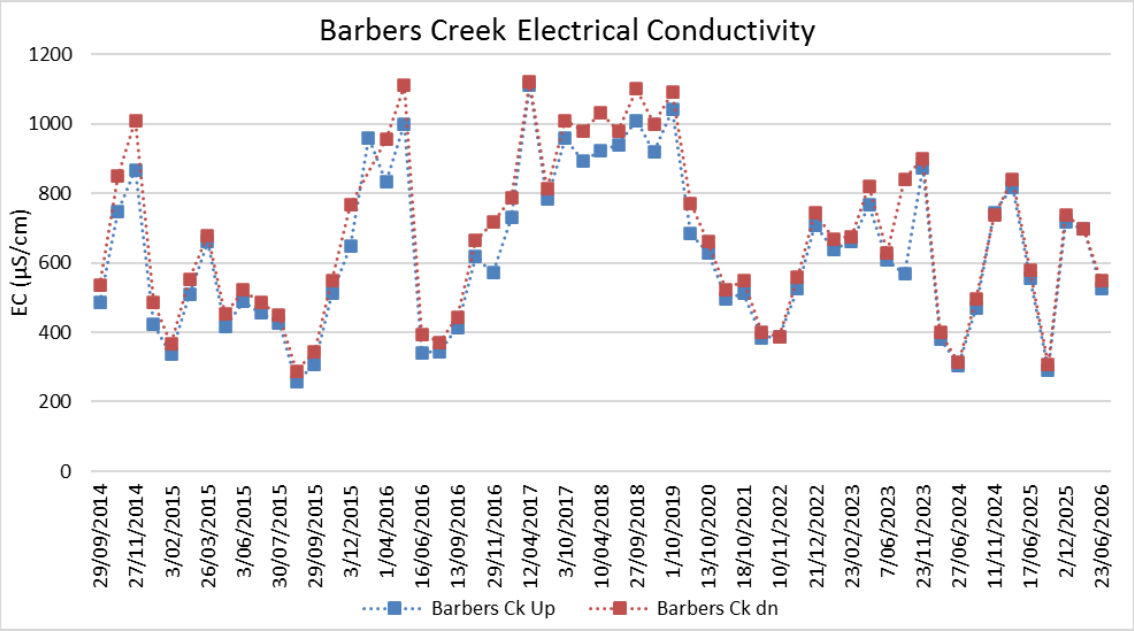
The pH levels at Barbers Creek upstream and downstream have ranged from 6.45 pH units to 8.28 pH units since September 2014 (Graph 1). The pH has been consistent during the same sampling period at the two sites, with average pH of 7.85 and 7.90 pH units upstream and downstream respectively. Values have been more variable since heavy rainfall and high flow conditions from 2021 onwards. The lowest pH for both upstream and downstream sites was recorded in June 2024.

All of the creeks being monitored are sourced within limestone bedrock systems. Although limestone is naturally alkaline, fast flowing surface water from high rainfall events would not allow sufficient time to raise the pH in normally neutral precipitation. Flow rate and duration of contact with limestone is the main factor affecting pH.



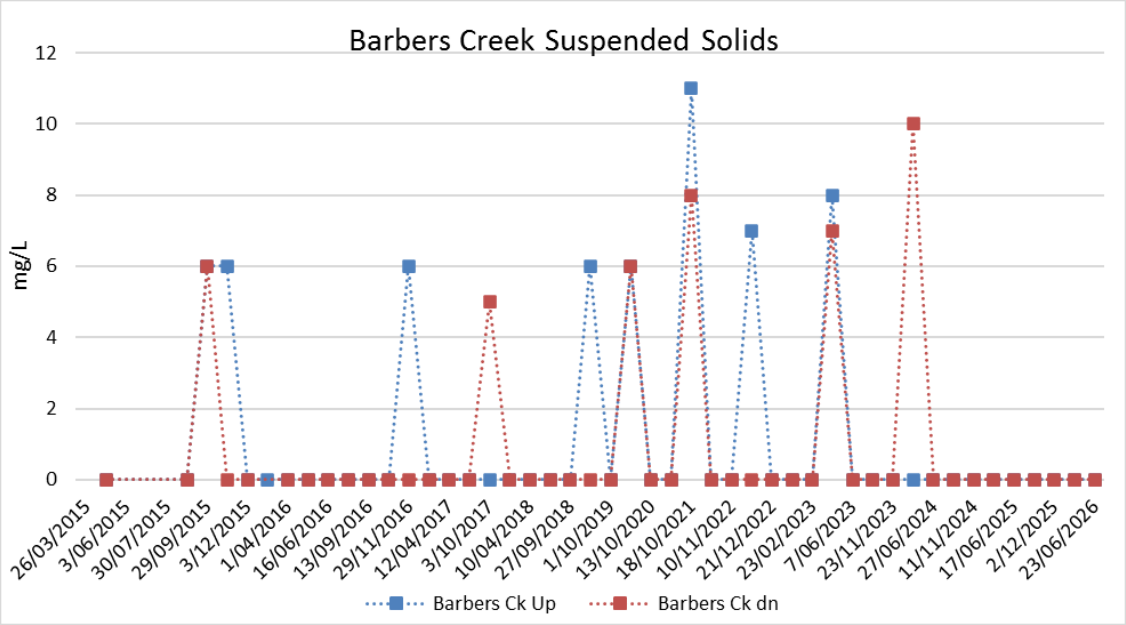

**Graph 1- Barbers Creek upstream and downstream pH**

The electrical conductivity levels in Barbers Creek have fluctuated from 257 µS/cm to 1120 µS/cm over the past 11 years as shown in Graph 2. The conductivity levels have remained similar at sites upstream and downstream during the same sampling periods. High levels of fluctuation were observed from 2014-2018 during drought conditions, which then plateaued at around 900 µS/cm for two years until 2020. Following higher rainfall, there has been a continued drop in conductivity to levels below 400 µS/cm which hadn't previously been recorded since late 2016.



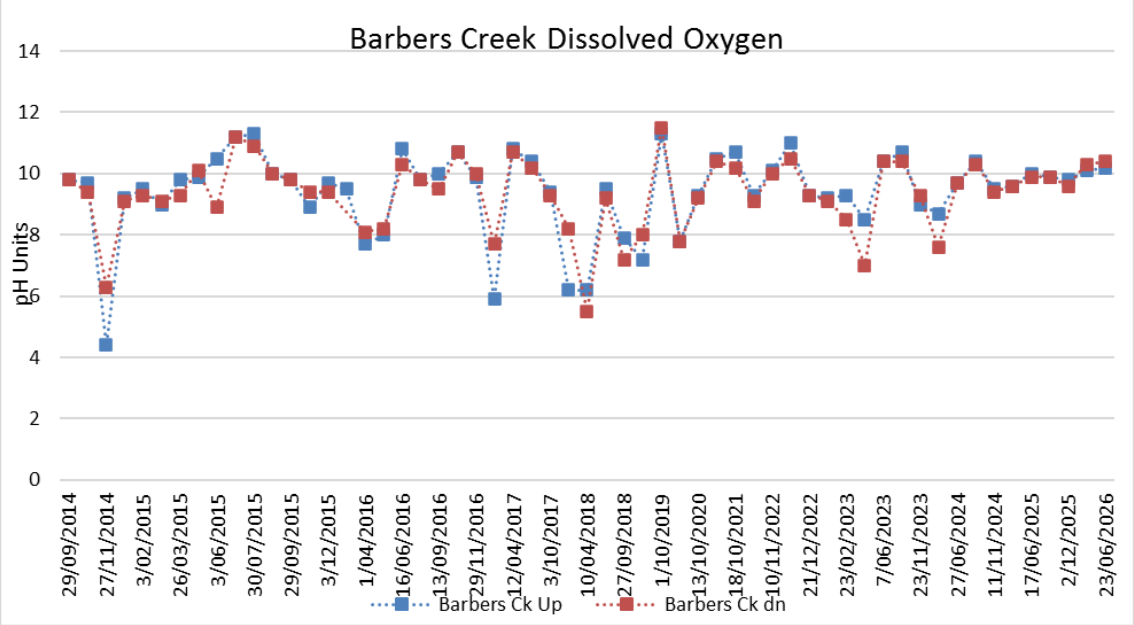

**Graph 2- Barbers Creek upstream and downstream EC**

The suspended solids in Barbers Creek are often below detection limits of <5 mg/L as shown in Graph 3 below. The highest levels of suspended solids were recorded in October 2021 at levels of 11 mg/L and 8 mg/L at Barbers Creek upstream and Barbers Creek downstream respectively. Suspended solids have remained below detection limits during the last eight monitoring rounds over the past 24 months.




**Graph 3- Barbers Creek upstream and downstream Suspended Solids**

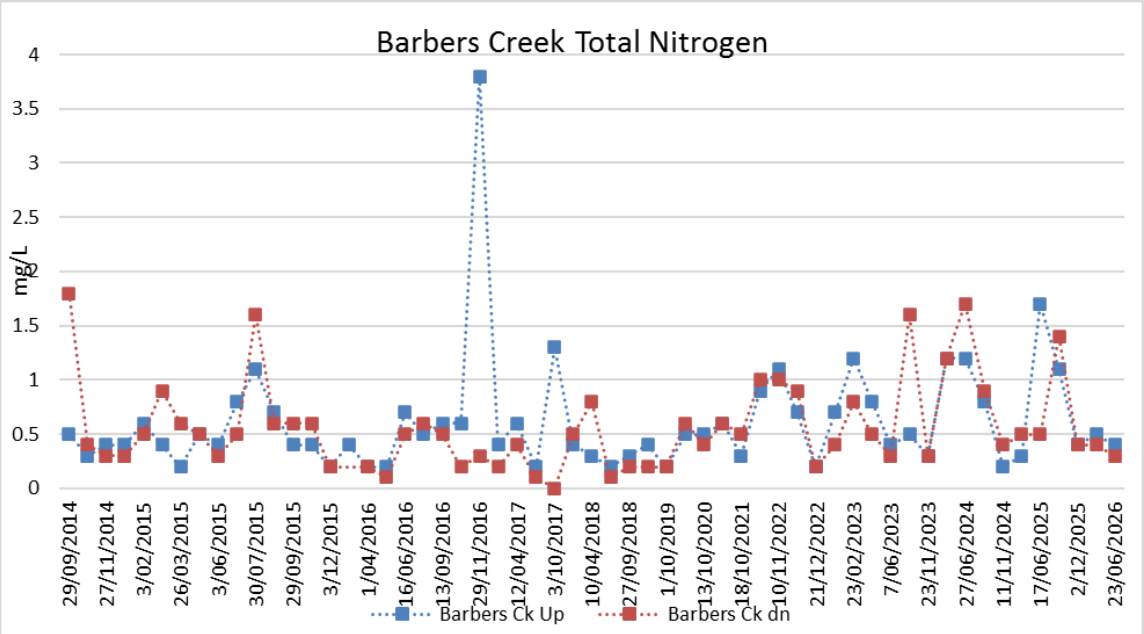
The dissolved oxygen levels in Barbers Creek range from 4.4 mg/L to 11.5 mg/L since 2014 (Graph 4). Samples taken from upstream and downstream sites have generally followed the same trend, with the same long term average of 9.3 mg/L at both sites. This oxygen level is more than sufficient to support aquatic life and guards against potential eutrophication.




**Graph 4- Barbers Creek upstream and downstream Dissolved Oxygen**

The total nitrogen levels in Barbers Creek have generally remained below 2 mg/L apart from one spike of 3.8 mg/L/ at the upstream site in April 2017 (Graph 5). The average total nitrogen at Barbers Creek upstream and downstream are 0.62 mg/L and 0.57 mg/L respectively.

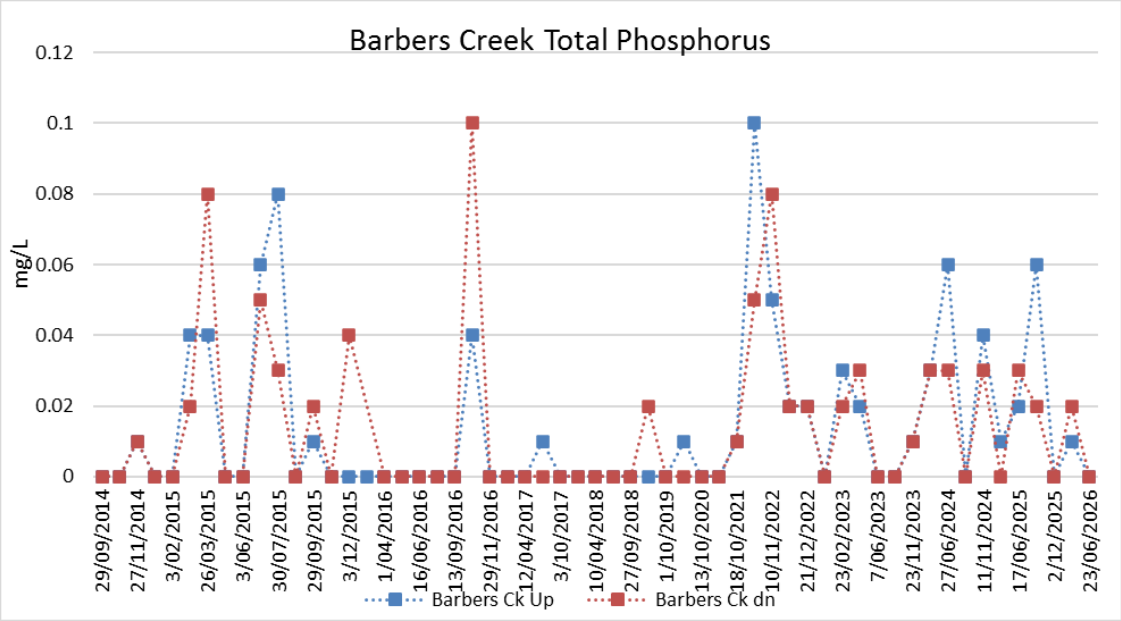
Nitrogen levels can be arbitrarily high at any point in time, particularly in small ephemeral creeks where a single dead animal can cause spikes in either Nitrogen or Phosphorus or both. If a spike appears, a comparison is made with other analytes such as dissolved oxygen to determine if there are any potential ongoing issues of concern. In this case, dissolved oxygen has remained generally between 6 and 11 mg/L which is indicative of a normal healthy river system.




**Graph 5- Barbers Creek upstream and downstream Total Nitrogen**

The Barbers Creek total phosphorous concentrations often remain below the detection limits of <0.01 mg/L, as shown in Graph 6 below. There have been several peaks in phosphorous over the past 11 years, with maximums recorded as 0.1mg/L at the upstream site in January 2023, and in the downstream site in December 2016.

Phosphorus is as an essential nutrient for all plant and animal life, commonly as phosphate in inorganic fertiliser. Natural levels of Phosphorus have a similar range of between 0.01 to 0.08 mg/L. ANZECC/ANZG 2018 guidelines place Phosphorus levels for natural rivers and streams at less than 0.1 mg/L. The levels found in Barbers Creek are within natural levels and do not indicate that there has been any contamination with fertilisers used in the rehabilitation work on the eastern emplacement and batter areas.




**Graph 6- Barbers Creek upstream and downstream Total Phosphorus**

When characterising general aquatic water systems, it is important to describe metal content. Metals vary in natural systems and usually reflect the type of underlying geology through which the waterway flows. Metal concentration can also be influenced by groundwater seeps and springs which can be metal rich due to the prolonged time in contact with source rock.

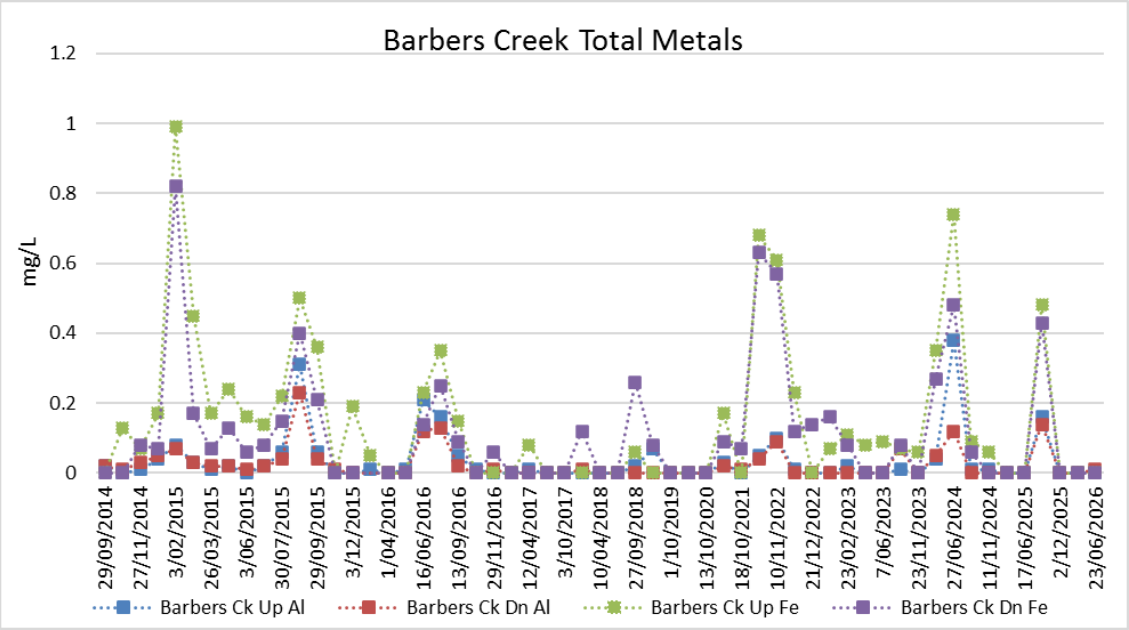
The analysis of metals in the following graphs use total values not dissolved or filtrable. These values are used to give an indication of total metal load for comparative purposes and are usually higher than the dissolved levels which are referenced in guidelines such as ANZECC 2000 as updated by ANZG 2018.

Graph 7 shows Aluminium and Iron concentrations both upstream and downstream in Barbers Creek. The graph shows that although concentrations fluctuate, they fluctuate in relative unison. This is generally and indication that the concentrations are reflective of rainfall and flow volumes within the creek. There is no indication that the section of Barbers Creek as it flows past the Marulan Mine is having an influence on the concentrations of Iron and Aluminium. It is also noted that the level of Aluminium in the water is generally low being below detection limits, but on occasions has been relatively high.

An elevated reading occurred in September 2015 with 0.31 mg/L Aluminium upstream and 0.23 mg/L downstream within Barbers Creek. There was an elevated Aluminium sample in June 2024 where the upstream site reached 0.38mg/L. This level had lowered at the downstream site which was recorded at 0.12 mg/L. With the long term average concentration of Total Aluminium being less than 0.05 mg/L, the elevated reading on a particular monitoring event could have several reasons. As Aluminium is often an ingredient in fertilisers, it could be reasonably assumed that the elevated levels could have been caused by rehabilitation activities. A review of other water quality parameters during that quarter also revealed elevated total Nitrogen levels which also supports the conclusion that this sample was exposed to fertilisers.

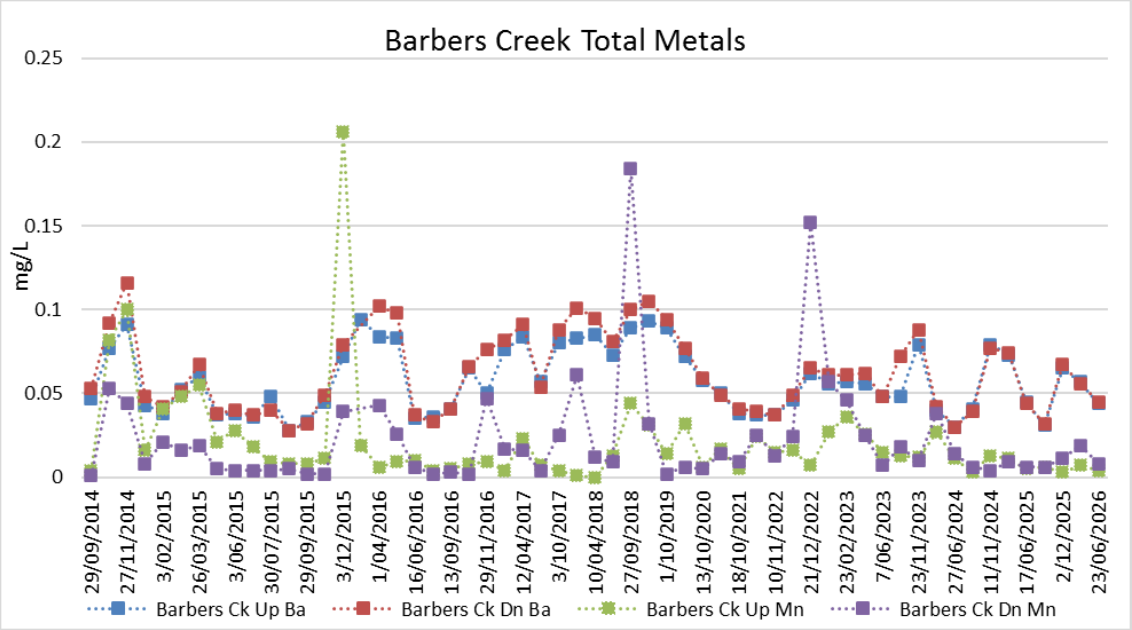
The use of fertilisers on rehabilitation areas is normal and it is expected to be detected in downstream water quality analysis. Short term spikes are not hazardous to normal environmental or riverine processes and have no lasting or ongoing impacts. However, excessive use of fertilisers can cause nutrient related impacts within receiving waters. This situation becomes

impacting if the elevated levels are sustained over longer time periods which often is the case with streams draining active agricultural areas where regular fertiliser treatments result in continual leaching of nutrients.




**Graph 7- Barbers Creek upstream and downstream Total Metals (Aluminium and Iron)**

Barium and Manganese concentrations are shown on Graph 8. Both minerals are naturally occurring although can also be generated by anthropogenic processes. Manganese is also a common fertiliser additive. There is no specified level of Barium in the ANZG 2018 guidelines however Manganese has a 95% ecosystem protection goal of 1.9 mg/L. A Manganese spike occurred in December 2015 shortly after the spike in Aluminium which also indicates that the cause could have been fertiliser addition which was making its way down stream. In May 2019 and December 2022 similar spikes in Manganese occurred in the downstream site indicating the time taken for the fertilisers to move through the sediments. This timeframe would be expected with an ephemeral creek system which does not see regular water movement but only following rainfall.




**Graph 8- Barbers Creek upstream and downstream Total Metals (Barium and Manganese)**

Barbers Creek is fed from a series of short ephemeral tributaries which drain the eastern slopes of the Marulan South Limestone Mine. It can therefore take several flushing events to move sediments into the main water course of Barbers Creek.

### 2.3.2 Bungonia Creek Water Quality Results

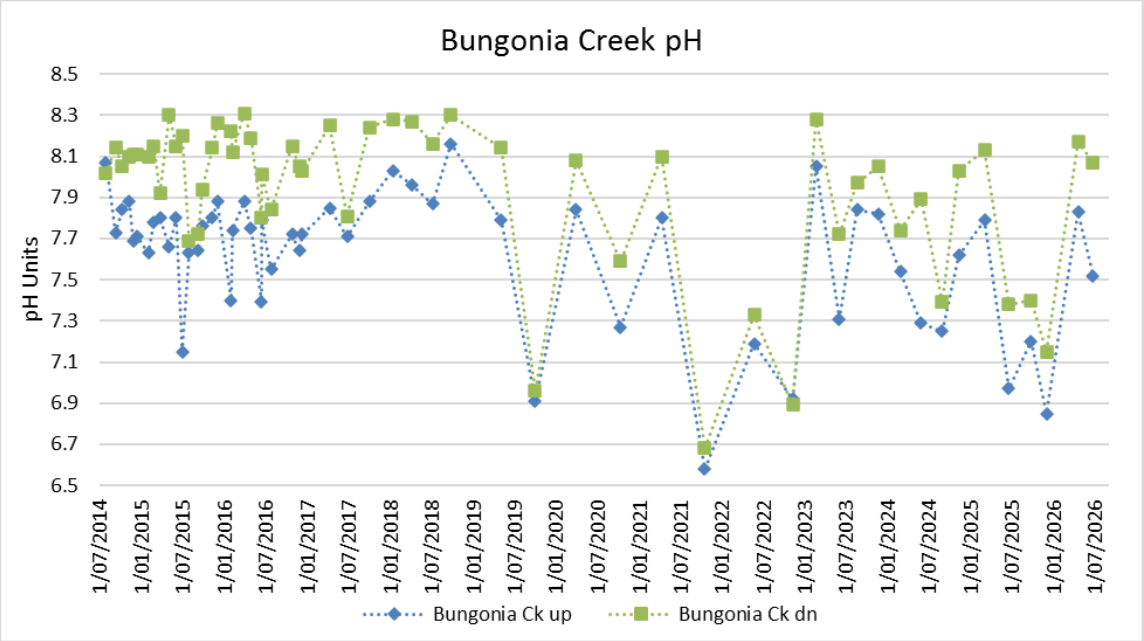
Bungonia Creek lies to the south of the Marulan South Limestone Mine. Both Barbers and Bungonia Creeks have similar geomorphology comprising bedrock, large boulders and pools with little macrophyte growth. There is a groundwater base flow component which assists in overall flow volume but can also have an effect on water quality in low flow conditions. Barbers Creek is more prone to having periods of no visible surface flow than Bungonia Creek.

Bungonia Creek receives water from Main Gully which is essentially the clean water diversion from the mine. It includes water from completed rehabilitation areas and undisturbed land however a large component of the original catchment has been cut off by the mine pit and overburden emplacements. This dirty water is directed into the South Pit.

Graphs 9 to 16 show the results of historic water quality in Bungonia Creek and centre on the upstream and downstream monitoring sites. The upstream site is well away from any potential influence of the mine while the downstream site is located just prior to the confluence with the Shoalhaven River.

Graph 9 shows the pH results from the upstream and downstream sites of Bungonia Creek. There is excellent correlation between the two sites indicating that variations in pH are caused by natural factors which impact both the sites in a similar manner.

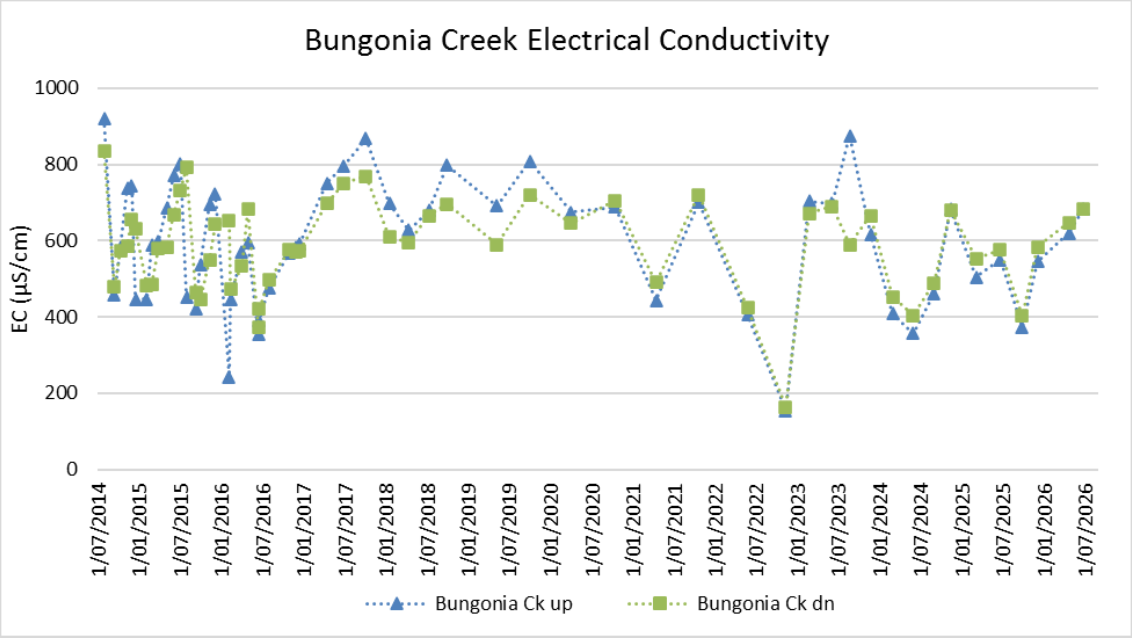
There is however an overall increase in alkalinity downstream of the mine with the Bungonia Down site having a long term average pH of 7.95 while the long term average for the upstream site being a pH of 7.63. Both values are reflective of the geology that the creek flows through.




**Graph 9- Bungonia Creek upstream and downstream pH**

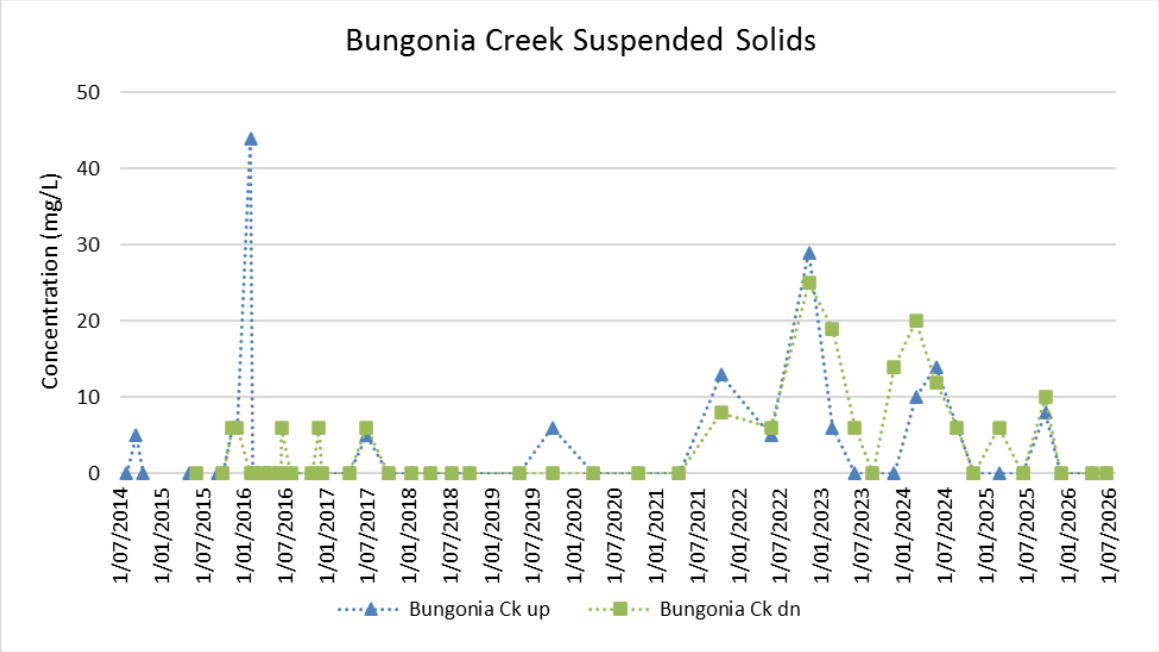
The salt content in water is measured as Electrical Conductivity. Fresh water generally has a very low conductivity of between 20 to 50 µS/cm. In natural waterways, the level of salt is a factor of the surrounding geology that the water is passing over and the length of time that the water is in contact with that strata. Groundwater generally has higher salt levels because it has spent longer in contact with the host rock while rainwater has very low conductivity because it has yet to be influenced by the surface it flows over on the ground.

Graph 10 shows the upstream and downstream conductivity results since 2014. This graph shows that there is some fluctuation in the level of salt but a very good correlation between the upstream and downstream sample sites. The long term average conductivity for the upstream site is 611 µS/cm, while the long term average for the downstream site is slightly lower at 594 µS/cm.

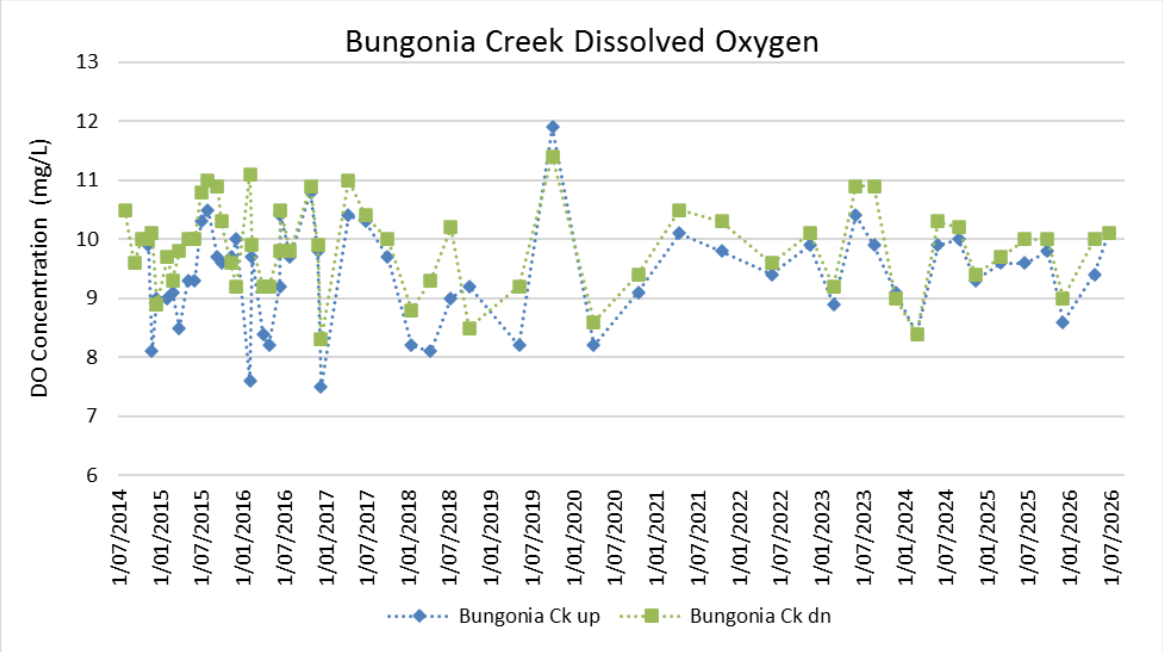



**Graph 10- Bungonia Creek upstream and downstream EC**

The long term average suspended solids and dissolved oxygen levels is shown in Graphs 11 and 12 respectively. The overall levels indicate that Bungonia Creek has very clear and well oxygenated water that is actively flowing. However, the data also shows that during storm events, sediment is moved downstream. These flushing events influence stream morphology over time. The Dissolved Oxygen levels are considered optimal for stream health and for the support of aquatic ecosystems.




**Graph 11- Bungonia Creek upstream and downstream Suspended Solids**




**Graph 12- Bungonia Creek upstream and downstream Dissolved Oxygen**

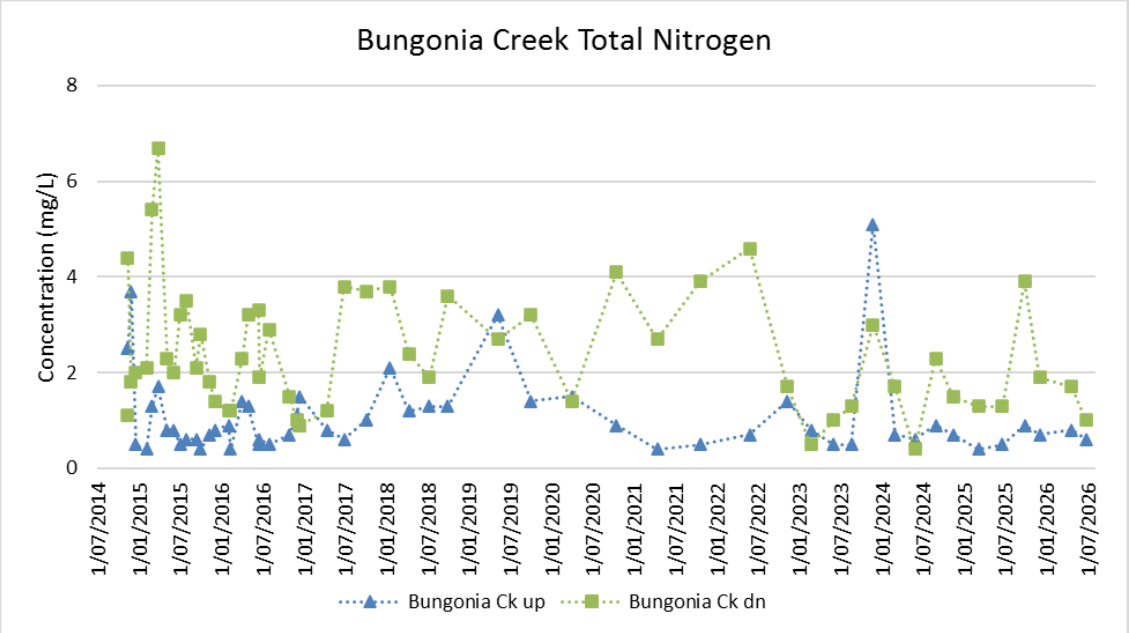
Nutrient levels are shown in Graphs 13 and 14. Nitrogen and Phosphorus are considered non-toxic environmental stressors. They are essential elements for ecosystem health but in larger quantities they can result in excessive algal growth and cyanobacterial blooms (ANZECC 2000).

Total Nitrogen values in an Upland River category under ANZECC 2000/2018 guidelines is 0.25 mg/L while the long term irrigation trigger value is 5 mg/L.

Although the overall levels are high, the upstream level is also elevated compared to the default ANZECC 2000/2018 goal. The increase downstream appears to be the result of the discharge from the Blowhole site which is located between the upstream and downstream sites. The results from the Blowhole are discussed in Section 2.3.2.

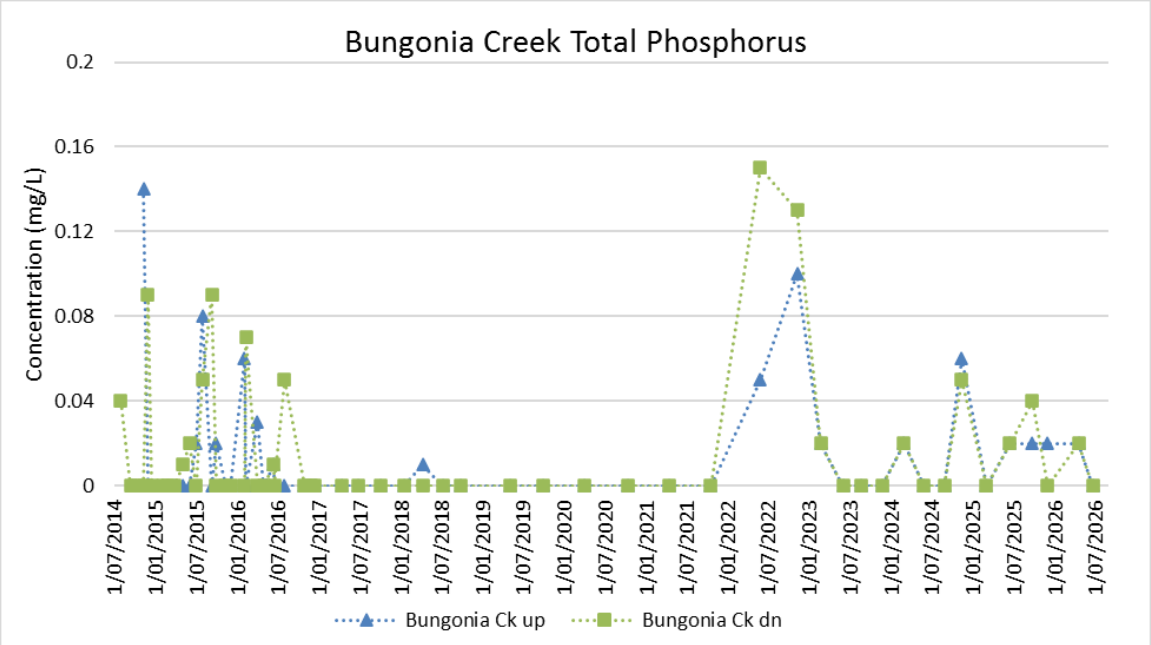
Bungonia Creek is approximately 30 km long and drains a large area of agricultural land upstream of the mine. The elevated Nitrogen could be caused by agricultural fertilisers however the increase from the upstream and downstream sites indicates that majority of the contribution is coming from the Blowhole (refer Graph 21).

As the levels are relatively consistent, it is unlikely to be caused by flow. Changes in flow appears to have an influence on some metals and suspended solids, however the concentration of Nitrogen has been relatively consistent despite changes in flow conditions between above average rainfall periods and drought. These issues are discussed in the following section.



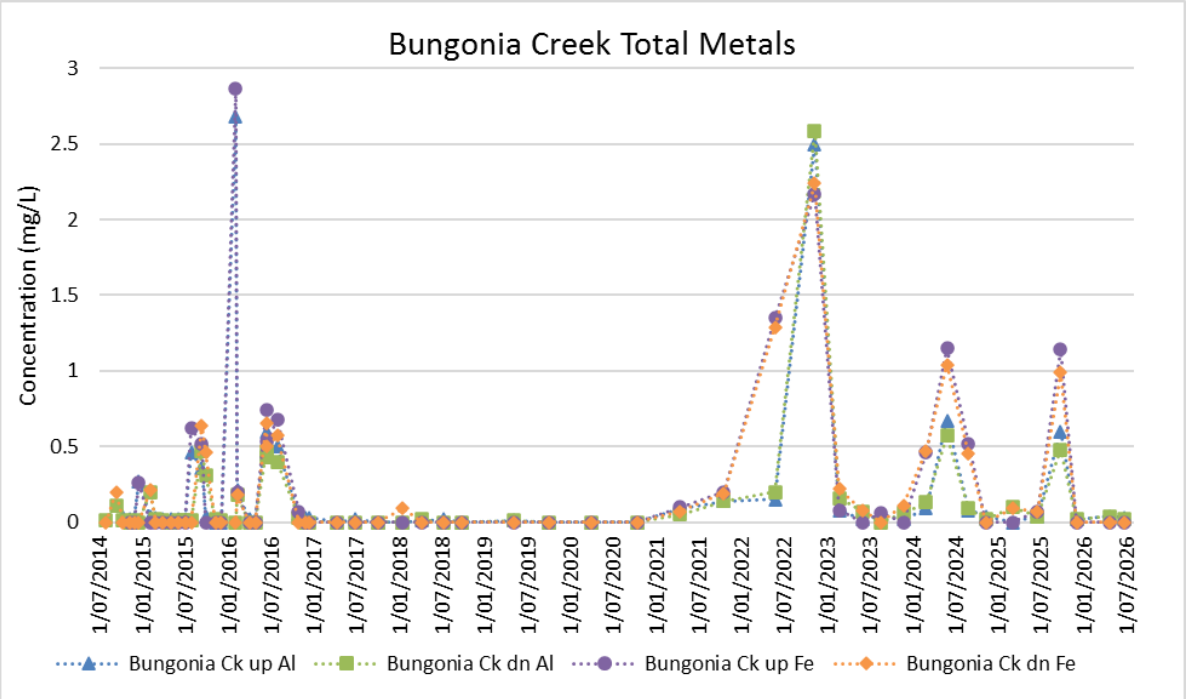

**Graph 13- Bungonia Creek upstream and downstream Total Nitrogen**

Phosphorus is also an indicator of nutrient levels. ANZECC 2000/2018 guidelines have a goal for Upland Rivers of 0.02 mg/L of Total Phosphorus. There are many occasions where the level of Phosphorus is above the environmental trigger. The monitoring program commenced in a period of higher flow conditions post Millennial Drought (2001-2009). This period was followed by dry conditions in 2017 to 2019 with subsequent above average rainfall in 2021-22.



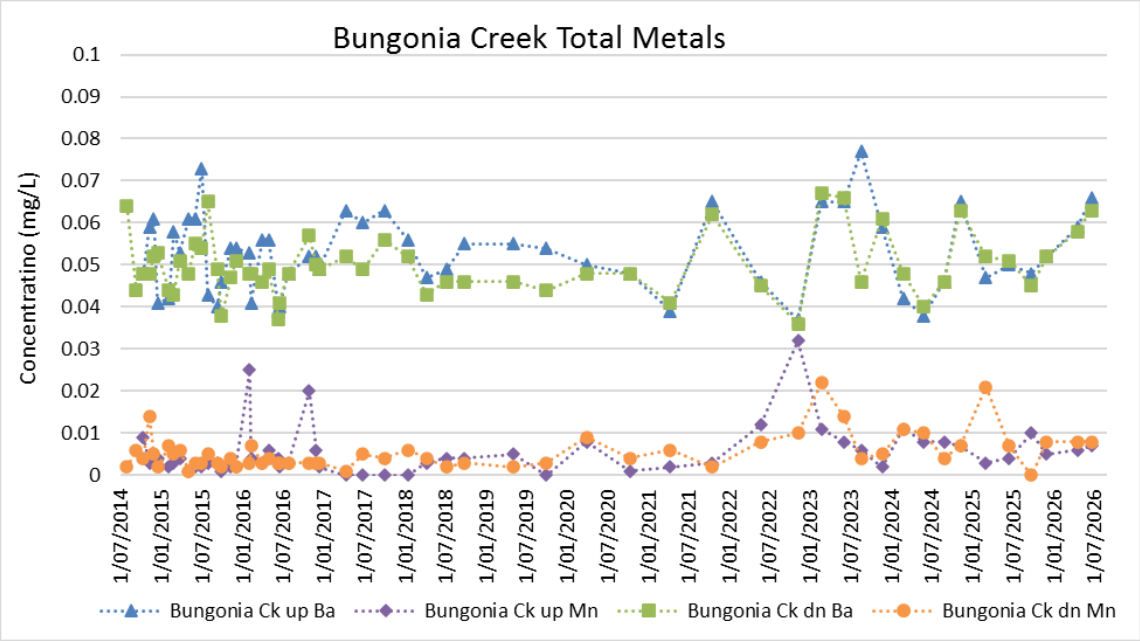

**Graph 14- Bungonia Creek upstream and downstream Total Phosphorus**

The pattern with Aluminium and Iron concentration is similar to that of Suspended Solids which appear to be influenced by flow conditions. Higher flow will tend to relocate minerals from higher in the catchment down towards the confluence with the Shoalhaven River. There was one elevated Iron level of 2.8 mg/L in February 2016 however there are no environmental goals specified for Iron concentration.




**Graph 15- Bungonia Creek upstream and downstream Total Metals (Aluminium and Iron)**

Other metals tend to follow a close correlation between the upstream and downstream sites and the overall levels are considered indicative of a healthy river system (Graph 16).




**Graph 16- Bungonia Creek upstream and downstream Total Metals (Barium and Manganese)**

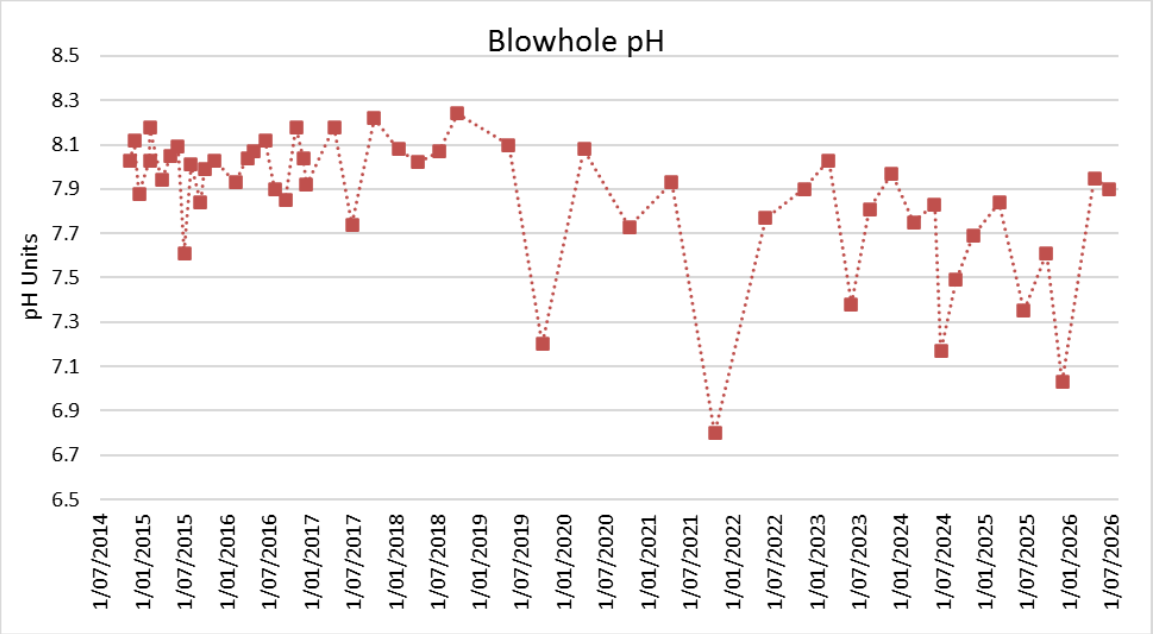
### 2.3.3 Blowhole Water Quality Results

The Blowhole site is located between the Bungonia Creek Upstream and Bungonia Creek Downstream sites. It is a natural spring at a lower elevation of South Pit, meaning its water is sourced from the limestone deposit below the extraction area. It is a point where groundwater discharges to surface waters and is a common feature in karst limestone environments. Being groundwater derived, the water quality is significantly different from the surface water of Bungonia Creek.

It is also possible that underground cavities exist within the limestone strata. These may contain organic compounds, stygofauna or accumulated minerals which can lead to vastly different water quality than would normally be derived from springs.

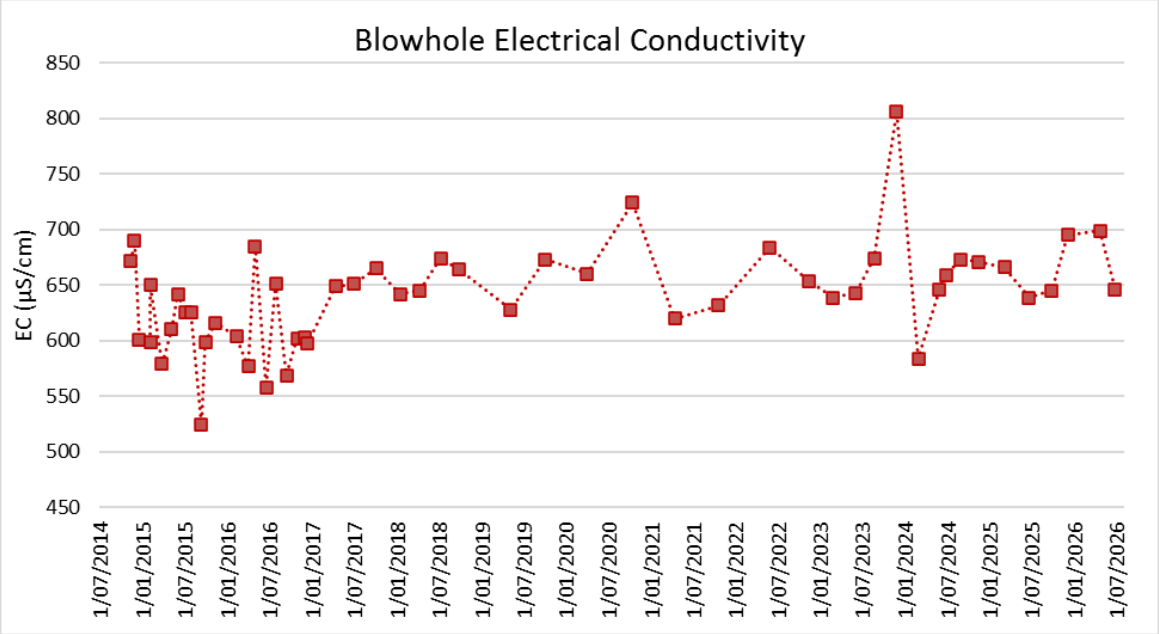
The pH levels at the Blowhole have spanned over a range of 1.4 pH units over the past 12 years, with a minimum and maximum of 6.8 pH units and 8.2 pH units respectively. The overall trend has shown a gradual decline in pH over this period of time (Graph 17). The average has been recorded as 7.9 pH units. The variability in pH indicates that there may well be other factors affecting the pH in addition to the surrounding limestone which would normally keep the pH relatively alkaline. A pH of below 7.5 on many occasions indicates that these other factors can overcome the alkalinity of the surrounding limestone.

The reasons for the variability and long term trend is unknown as the actual origin and environment of the water source is also unknown. Given the geomorphological nature of the spring, its presence predates the commencement of limestone extraction. It's likely that the variability in water quality is simply a natural phenomenon.



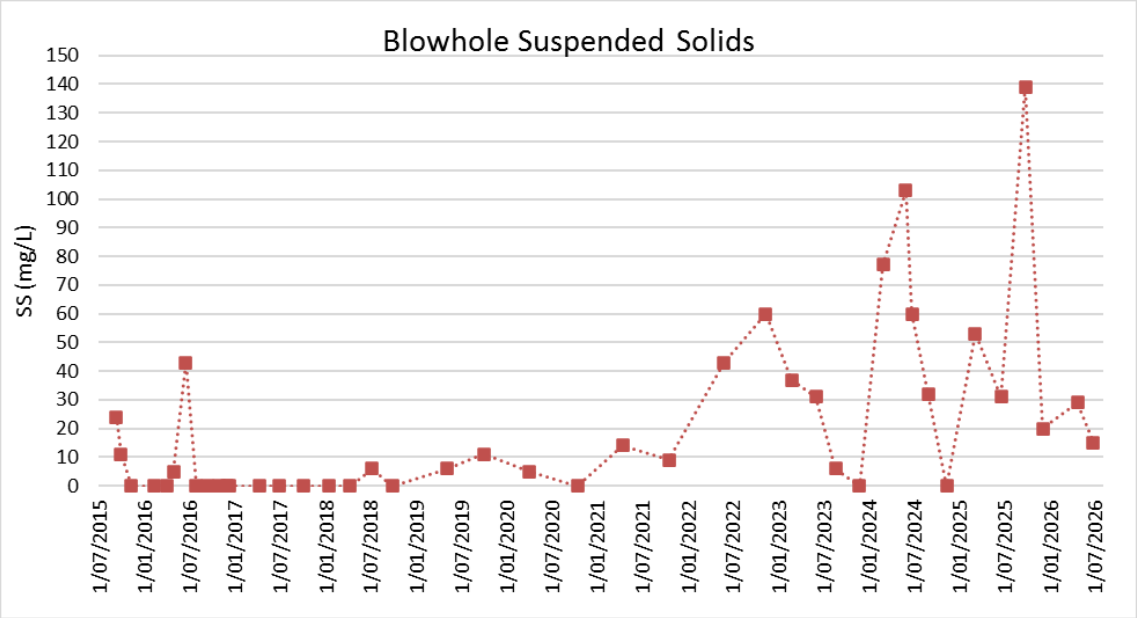

**Graph 17- Blowhole pH**

Graph 18 below shows that the electrical conductivity concentration of the Blowhole has fluctuated from 524 µS/cm to 806 µS/cm with an average of 638 µS/cm since 2014. The concentration has remained relatively stable over this period of time, with no obvious trends.



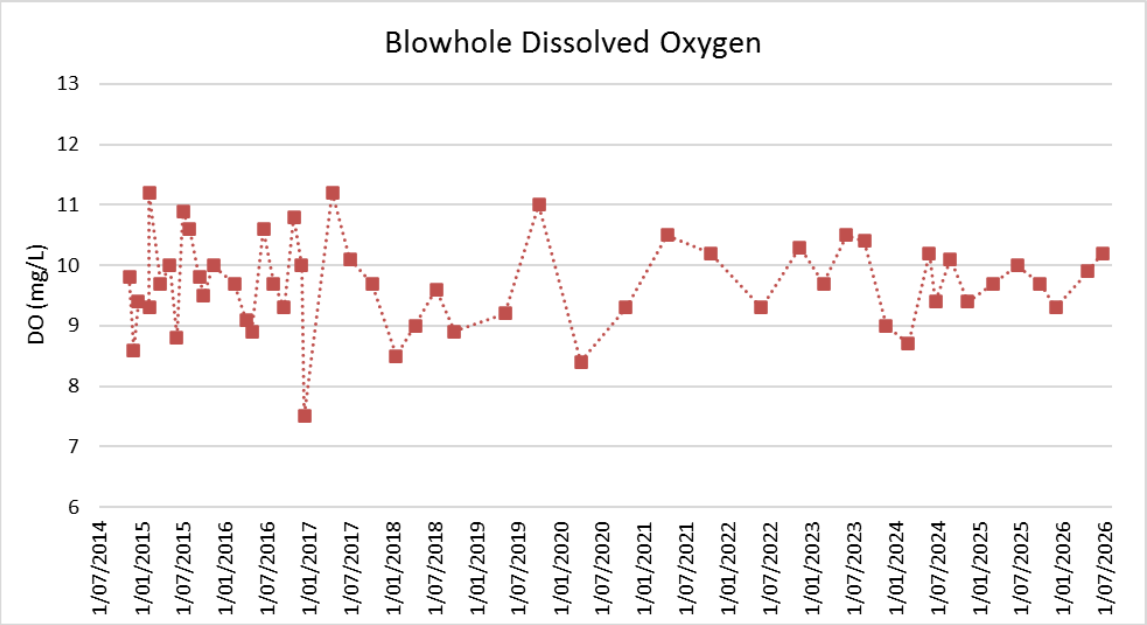

**Graph 18- Blowhole Electrical Conductivity**

The suspended solids generally remained below the detection limits (<5mg/L), with only a few outliers up until 2019 (Graph 19). Since that time, the levels have ranged between <5 mg/L to 139 mg/L, with an increasing trend since January 2022. Suspended Solids peaked in September 2025 with levels as high as 139 mg/L. During periods of high solids loading, the discharge has been noted as brown to orange in colour. This indicates the presence of elevated minerals.



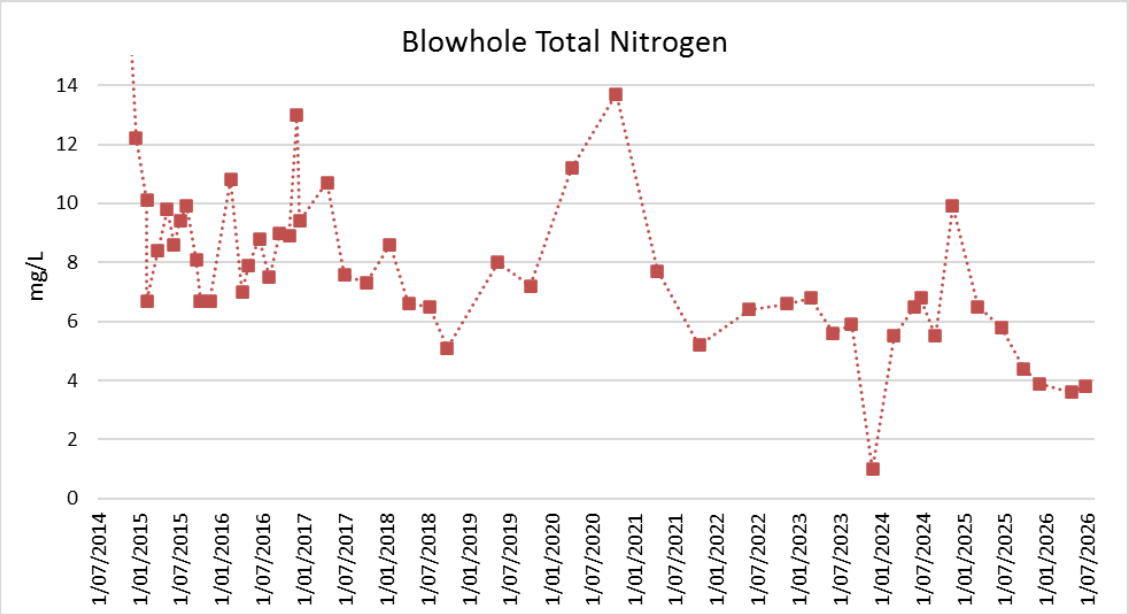

**Graph 19- Blowhole Suspended Solids**

The dissolved oxygen concentrations within the Blowhole have remained relatively consistent, with an average of 9.70 mg/L and a range of 7.5 mg/L to 11.2 mg/L, as shown on Graph 20. Results show that the groundwater discharged from the Blowhole has sufficient dissolved oxygen levels to support aquatic life.



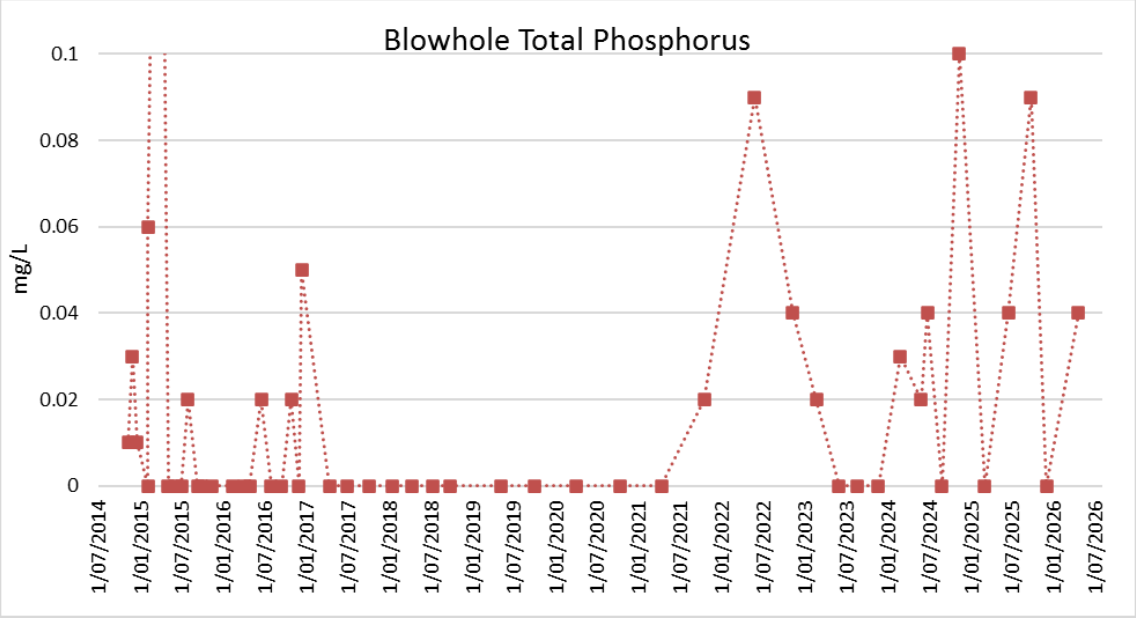

**Graph 20- Blowhole Dissolved Oxygen**

Nitrogen and Phosphorus occur naturally but the levels at the Blowhole are uncharacteristically high (Graph 21 and 22). For natural systems to yield Nitrogen at the measured levels would indicate the presence of high levels of organic matter. As the volume of the Blowhole discharge is relatively small, there is only a minor increase in Nitrogen levels downstream (refer Graph 13). However, the cause of the elevated Nitrogen is unknown. The long term average Total Nitrogen concentrations are 8.2 mg/L, with a range of 1.0 mg/L to 15.1 mg/L.



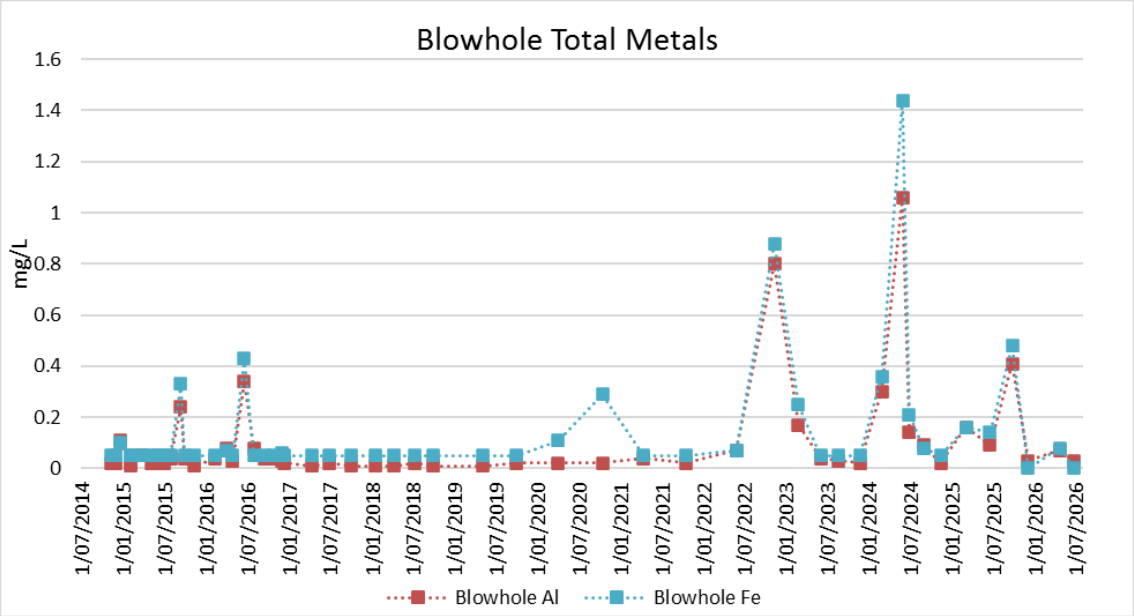

**Graph 21- Blowhole Total Nitrogen**

For a period of 4 years from 2017 to 2021, the phosphorus concentration remained below the detection limit of 0.001 mg/L. Levels of phosphorus spiked in June 2022, with a level of 0.09 mg/L during heavy rainfall and high flow events (Graph 22). The concentration of phosphorus dropped back below detection limits later in 2023. Phosphorus levels have been elevated from 2024-2026. During November 2024 the concentration increased to 0.1 mg/L.



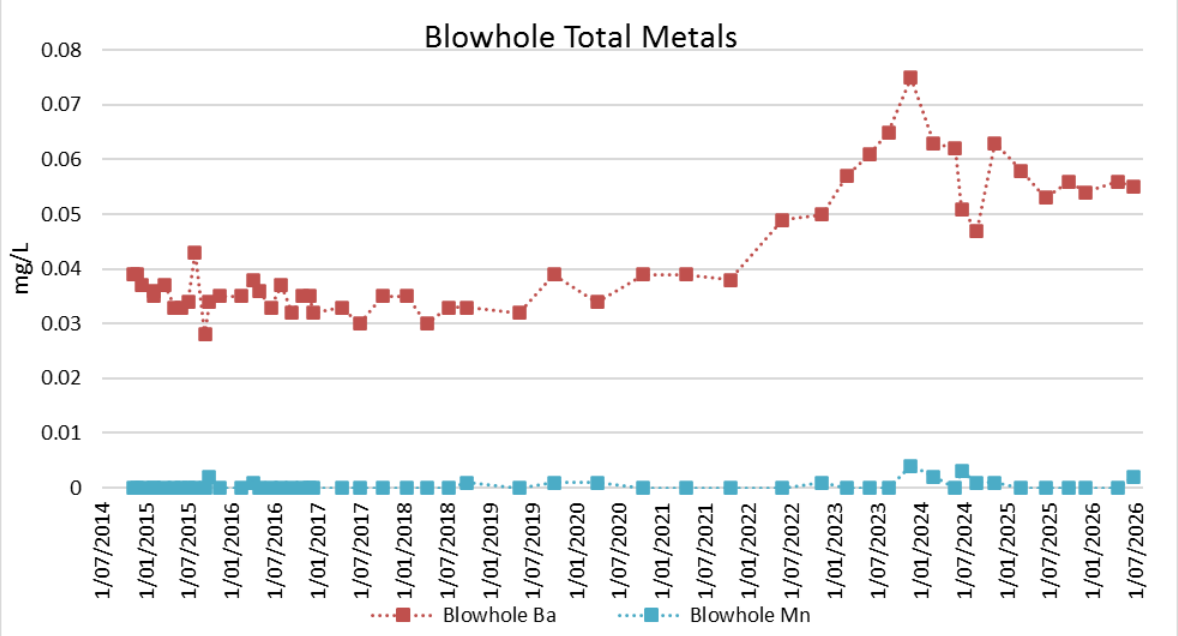

**Graph 22- Blowhole Total Phosphorus**

The total Aluminium and Iron concentrations mirror the trends observed for phosphorus above. The metals in Graph 23 show lowered concentrations, often below detection limits during the drought, with elevated levels peaking in November 2022, before dropping back to lowered concentrations in 2023. The highest were recorded in 2024, with Aluminium and Iron levels of 1.06 mg/L and 1.44 mg/L, with long terms averages of 0.09 mg/L and 0.14 mg/L respectively.




**Graph 23- Blowhole Total Metals (Aluminium and Iron)**

Barium has shown an increasing trend since mid-2020, with a maximum concentration of 0.075 mg/L and an average of 0.041 mg/L since 2014 (Graph 24). Manganese is also shown on Graph 24, with levels often below detection limits of 0.001 mg/L and an average of 0.005 mg/L.




**Graph 24- Blowhole Total Metals (Barium and Manganese)**

### 2.3.4 Main Gully

Main Gully Sediment Basin 2 is equipped with an automatic water sampler which is triggered automatically when the water levels rise during storm events. Heavy rainfall caused six overflow events during the reporting period, while pumping from the Black Dam caused an additional two discharges form Main Gully. The majority of discharges were single day events, with the exception of the 9 day discharge beginning on 2nd September and the 5 day discharge on the 3rd March. Results from the discharge event are in Table 1.

- On the 2nd July 2025 a total of 91mm rainfall was recorded at the site weather station which exceeded the 95% 5 day rain event for Marulan (i.e. where rainfall exceeds 52.8 mm in a 5-day period). This resulted in a single day discharge from Main Gully, which was sampled by the auto-sampler.
- A single day discharge occurred from Main Gully on the 2nd August 2025 following 29.2mm of rainfall over a two day period.
- A single day discharge occurred from Main Gully on the 18th August 2025.
- Beginning on the 2nd September 2025 a 9 day discharge event occurred. This discharge occurred in response to pumping from the Black Dam on site.
- On the 10th February 2026 a single day discharge occurred from Main Gully following 41.8mm rainfall over a three day period. The water quality results from this discharge event are missing.
- A 5 day discharge event occurred from the 3rd March to 7th March 2026. This exceeded the 95% 5 day rain event for Marulan, with 61.4mm rainfall recorded over a 5 day period.
- A single day discharge occurred on the 29th March 2026 following 20.8mm rainfall on the two days prior.
- On the 28th May 2026 a discharge occurred at Main Gully, following 27.6mm rainfall recorded over a two day period.

**Table 1- Main Gully Overflow Water Quality Monitoring Results**

| Date | pH Units | Suspended Solids (mg/L) | Turbidity (NTU) | Oil and Grease (mg/L) |
|---|---|---|---|---|
| 2/07/2025 | 7.92 | 1650 | 3820 | <5 |
| 2/08/2025 | 8.03 | 1600 | 3110 | <5 |
| 18/08/2025 | 7.93 | 8 | 20.6 | <5 |
| 2/09/2025 | 8.34 | 2.5 | 3.6 | <5 |
| 3/09/2025 | 8.38 | 16 | 22 | <5 |
| 4/09/2025 | 8.34 | 40 | 71 | <5 |
| 5/09/2025 | 8.39 | 2.5 | 2.9 | <5 |
| 6/09/2025 | 8.38 | 8 | 14 | <5 |
| 7/09/2025 | 8.35 | 8 | 16.6 | <5 |
| 8/09/2025 | 8.37 | 12 | 11.7 | <5 |
| 9/09/2025 | 8.40 | 16 | 24.8 | <5 |
| 10/09/2025 | 8.35 | 2.5 | 7 | <5 |
| 3/03/2026 | 7.25 | 184000 | 329000 | <5 |
| 4/03/2026 | 7.63 | 96300 | 192000 | <5 |
| 5/03/2026 | 7.64 | 51200 | 96200 | <5 |
| 7/03/2026 | 7.83 | 9380 | 14800 | <5 |
| 29/03/2026 | 7.89 | 12 | 9.8 | <5 |
| 28/05/2026 | 8.14 | 2.5 | 2.3 | <5 |

pH units ranged from 7.25–8.40 during discharge events showing generally neutral to slightly alkaline water quality. Overall, there was no sustained trend toward either acidic or highly alkaline conditions.

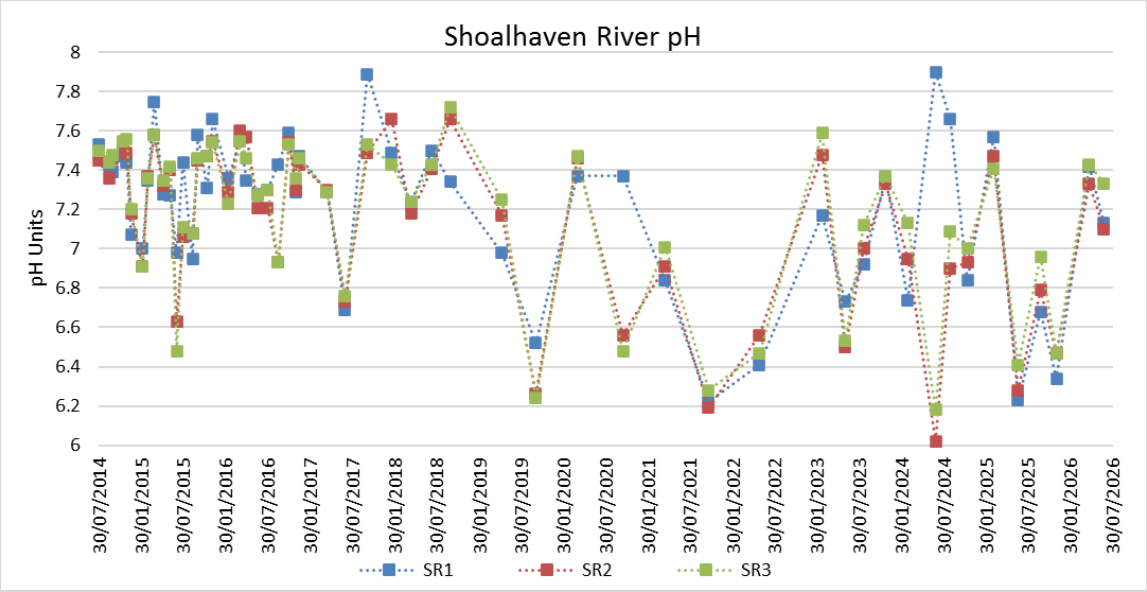
There was a high variability of both suspended solids and turbidity during discharge events. During the March 2026 5 day discharge, suspended solids were elevated at 184,000 mg/L and Turbidity reached levels of 329,000 NTU, which progressively declined over the following days. Most discharge events have suspended solids and turbidity levels under 20mg/L and 25 NTU respectively. This pattern may indicate the discharge of highly turbid water associated with a temporary disturbance or mobilisation of sediment within the water management system, rather than consistently elevated suspended solids in the discharge.

Oil and grease concentrations were consistently reported as <5 mg/L for all samples, indicating that concentrations remained below the laboratory reporting limit throughout the monitoring period.

### 2.3.5 Shoalhaven River Water Quality Results

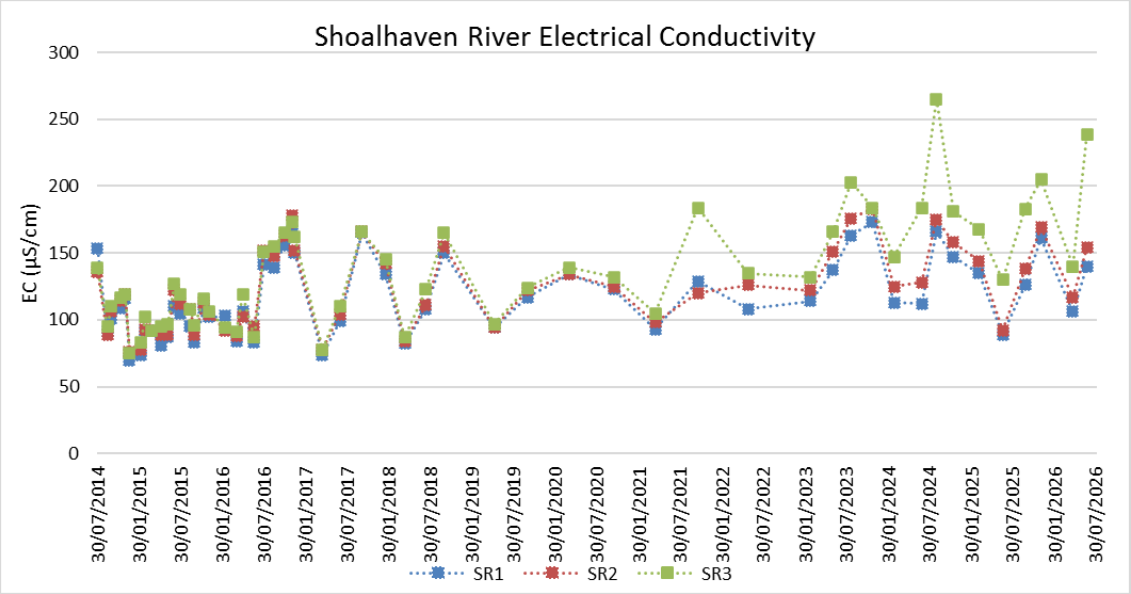
The pH values in the Shoalhaven River are shown in Graph 25 below. The pH has generally remained relatively consistent at all three sites within the river, with averages of 7.23 pH units at SR1, 7.16 at SR2 and 7.18 pH units at SR3. Values ranged from 6.02 to 7.90 pH units over the past 12 years. The most variability has been observed in June 2024, with the upstream site peaking at 7.9 pH units while SR2 and SR3 dropped to 6.04 and 6.18 pH units respectively. During June 2024 there was a small increase in EC and TDS at the downstream sites which can increase the acidity of the water. The pH was also a little lower in Barbers Creek than previously which has a small contribution to the receiving waters of the Shoalhaven River. Following 3 months, the high variability between the sites was no longer apparent.

There is generally very good correlation between all three sample sites within the Shoalhaven River indicating that the Marulan Limestone Mine is not influencing natural variability.




**Graph 25- Shoalhaven River pH**

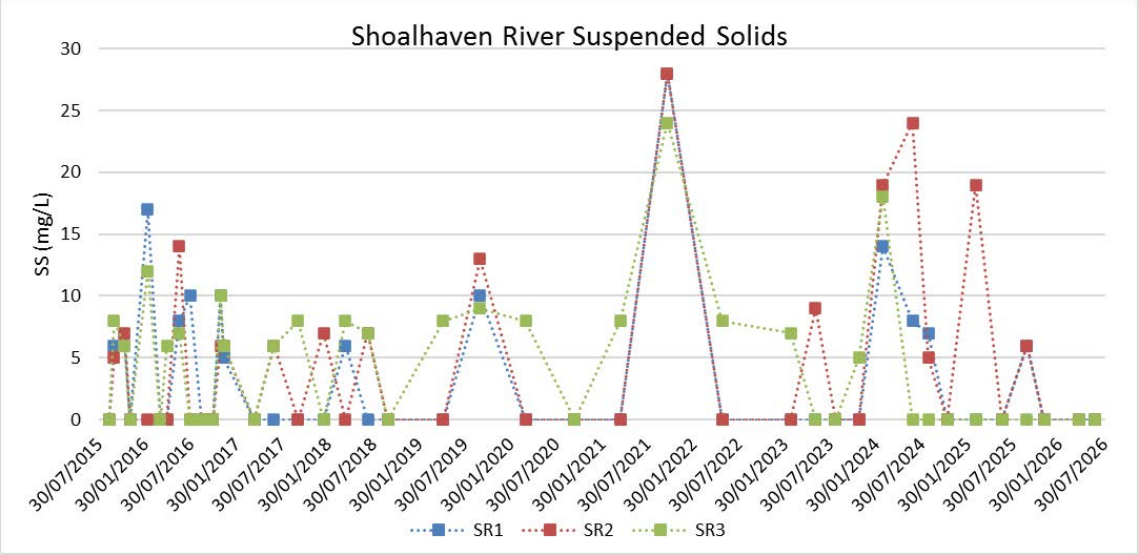
The electrical conductivity values are closely mirrored at upstream and downstream sites in the Shoalhaven River. From 2020 onwards, the conductivity has been slightly higher at the downstream site (SR3), as seen in Graph 26. There was a spike in conductivity at SR3 in August 2024, in which the highest value of 265 µS/cm was recorded. The average conductivity across SR1, SR2 and SR3 are 115 µS/cm, 120 µS/cm and 131 µS/cm respectively.




**Graph 26- Shoalhaven River Electrical Conductivity**

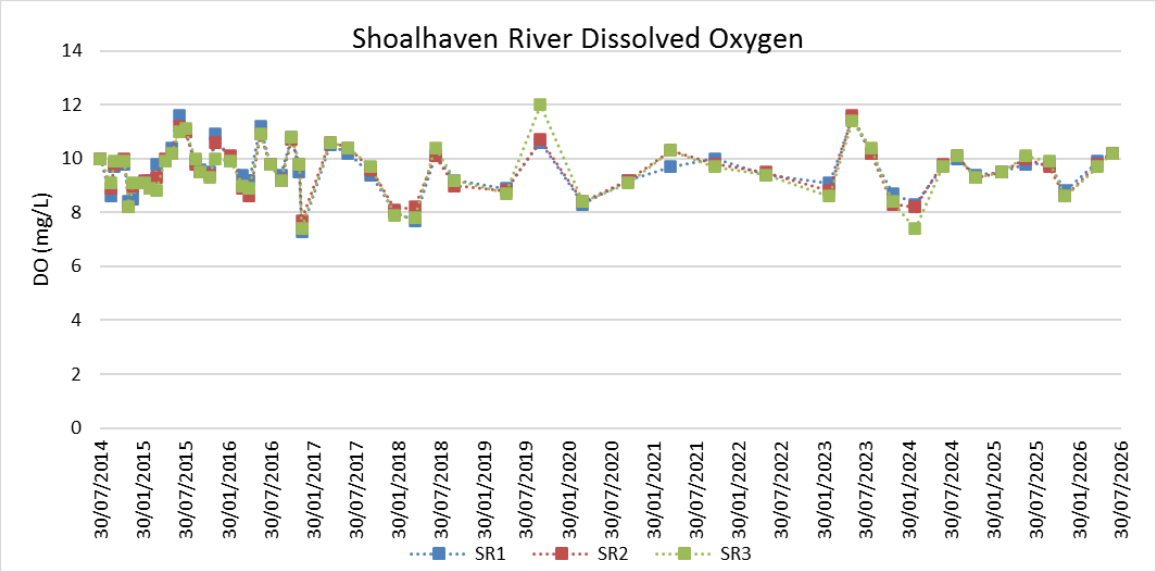
The suspended solids in the Shoalhaven River range from below detection limits (5 mg/L) to a maximum of 28 mg/L at SR2, which was experienced during the heavy rain events in 2021 (Graph 27). The levels generally fluctuate between <5 mg/L and 15 mg/L, with only a few peaks above these values over the past 12 years.

Suspended solids is a measure of fine particle movement within a waterway. It can indicate erosion caused by high rainfall events or poor quality water being discharged from a mine site. As there is very good correlation between all three sample sites within the Shoalhaven River, the Marulan Mine is not contributing to the solids loading of the Shoalhaven River.




**Graph 27- Shoalhaven River Suspended Solids**

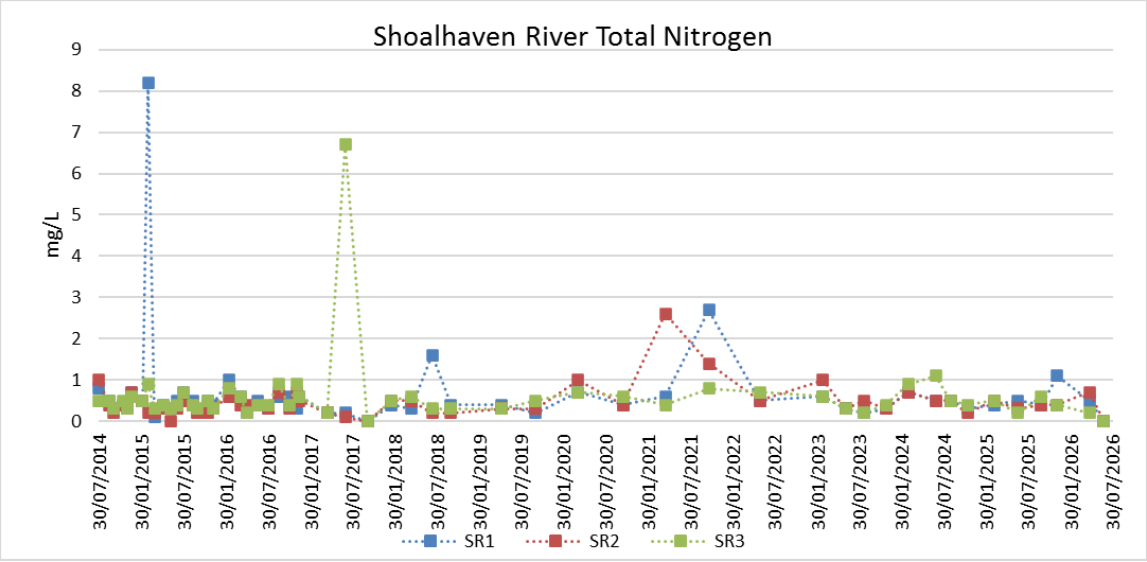
Dissolved oxygen has historically ranged from 7.3 mg/L to 12.0 mg/L over the three sites within the Shoalhaven River, which is within the range for a healthy ecosystem (Graph 28).




**Graph 28- Shoalhaven River Dissolved Oxygen**

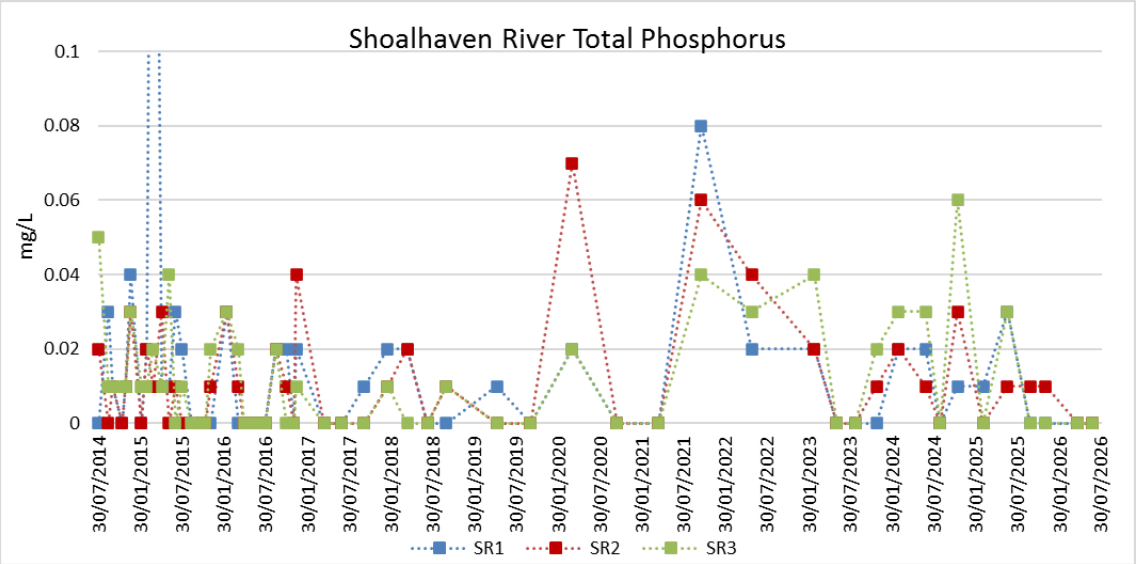
Total Nitrogen generally remained below 3 mg/L as shown in Graph 29 below. The two outlying values were 8.2 mg/L at SR1 in February 2015 and 6.7 mg/L in June 2017 at SR3. On average the Total Nitrogen concentration across all sites is 0.6 mg/L.

The two outlying results occurred in site SR1 which is an upstream site while the second occurred in the far downstream site SR3. The corresponding values for the middle site SR2 were in normal ranges. This indicates local sources of the elevated nitrogen rather than from any discharge from Bungonia or Barbers Creeks.




**Graph 29- Shoalhaven River Total Nitrogen**

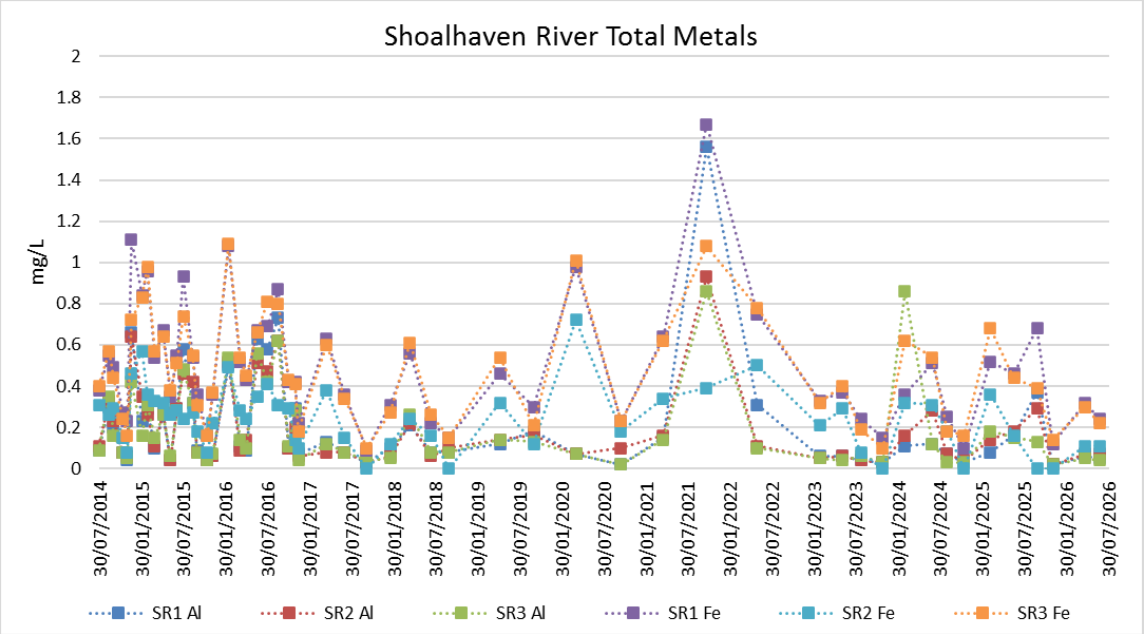
The total Phosphorus levels range from below detection limits (0.01 mg/L) to a maximum of 0.31 mg/L at SR1 in March 2015. SR1 is the upstream site and not related to any influence from the mine. Generally, phosphorus levels remain below 0.04 mg/L based on results over the past 12 years (Graph 30).




**Graph 30- Shoalhaven River Total Phosphorus**

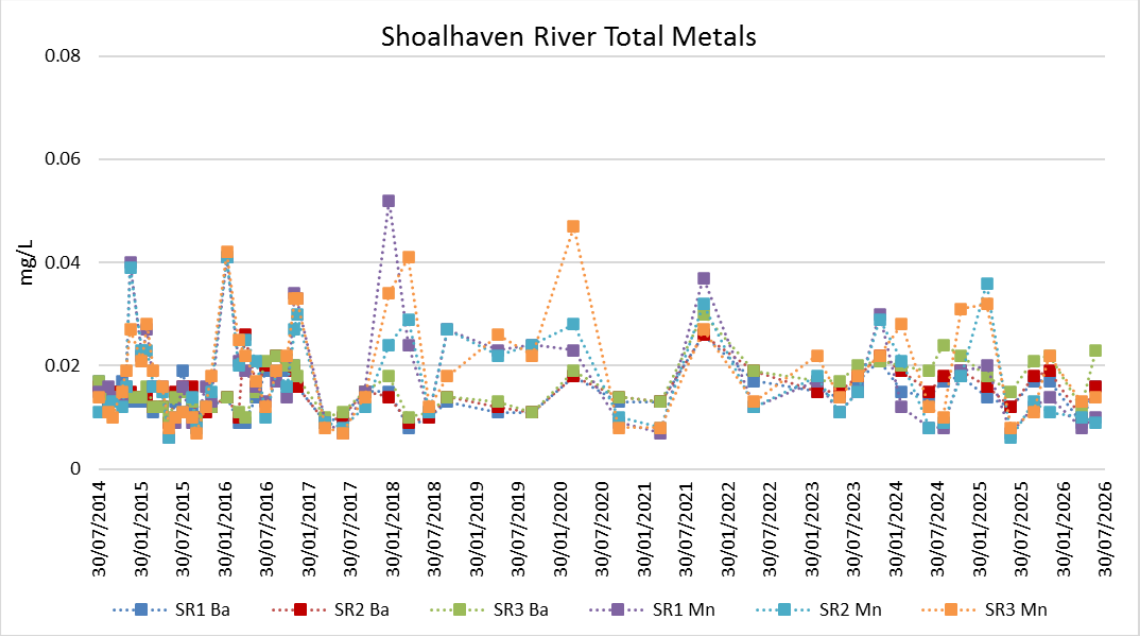
Total metals aluminium and iron are shown below on Graph 31. The combined average aluminium concentration across all sites was 0.15 mg/L, with a minimum and maximum of 0.01 mg/L and 1.56 mg/L. Aluminium concentrations were slightly lower upstream at SR1 than at the two sites further downstream (SR2 and SR3). An elevated aluminium concentration was recorded in October 2021, which follows the same trend as other total metals, suspended solids, nitrogen and phosphorus. This was during a period of high rainfall and is considered the likely source of the elevated nutrients and mineral content.

As for the iron concentrations, the average concentrations at sample sites SR1, SR2 and SR3 are 0.51 mg/L, 0.50 mg/L and 0.49 mg/L respectively (Graph 31). There is a peak in levels during October 2021, where levels recorded are as high as 1.67 mg/L.




**Graph 31- Shoalhaven River Total Metals (Aluminium and Iron)**

Average Barium concentrations within the Shoalhaven River are 0.015mg/L, as shown on Graph 32. Total manganese concentrations ranged from 0.003 mg/L to 0.052 mg/L with an average of 0.015 mg/L since 2014. These levels are considered low and typical of an upland river system.




**Graph 32- Shoalhaven River Total Metals (Barium and Manganese)**

# 3. Geomorphology and Riparian Health

The outcomes of the geomorphology monitoring are discussed in the following sections. These include a photographic record of the stream morphology undertaken during the quarterly surface monitoring program.

## 3.1 Monitoring Program

Section 6.5 of the Water Management Plan requires quarterly monitoring of Bungonia Creek, Barbers Creek and Shoalhaven River. The monitoring is to include a visual inspection to assess any potential changes in the stream or vegetation health. The selected sites are the upstream and downstream water quality monitoring locations for each waterway. The inspections involve photographing the channel and creek banks, description of the condition and note any changes observed since the last inspection.

Although required to be commenced in the first quarter of 2023, the water quality monitoring program has included a photographic record of the sample point at the time of sampling prior to 2020. Selected photographs are provided in Appendix A. These photos show each of the sample points from the beginning of the water quality program to the most recent inspection date in June 2026.

The inspections of each site now take into account details of riparian vegetation condition, channel form and condition in accordance with the River Styles framework. This includes the following attributes:

- Lateral stability – identification of channel expansion, bank erosion migration and avulsion processes.
- Riparian vegetation – qualitative rating of the composition (native vs exotic), continuity and vegetation assemblages in the riparian zone.
- Grain size and sorting – visual estimate of the percent of the bed that comprises different grain size fractions.
- Bed stability and hydraulic diversity of sediment regime – interpretation of vertical bed activity via incision, visual estimate of surface water flow, identify sediment process zones (ie source transfer, accumulation).

The results of the monitoring program to date are discussed in Section 3.2 below.

## 3.2 Summary of Results

### 3.2.1 Barbers Creek

Barbers Creek Upstream photos are provided in Plates 1 of Appendix A and Barbers Downstream photos are provided in Plate 2 of Appendix A. Barbers Creek is a steep, confined, bedrock-controlled tributary characterised by coarse sediment, rock pools and a relatively high channel gradient. The gradient of the channel ranges from 5% to 6%. Barbers Creek is a fifth order stream at the junction with the Shoalhaven River. About 1.5km upstream from the

confluence with Marulan Creek, Barbers Creek enters a steep sided gorge (Confined Valley Setting-Gorge) which extends for a distance of about 8 km down to the Shoalhaven River.

As shown on Plate 1, the upstream site has a rocky bed and banks with the banks showing signs of erosive water velocities. The bank has between 0% and 50% vegetation cover with some sections showing active erosive surfaces. This is a dynamic section of creek line where flow velocity ranges from near zero to extreme with sufficient force to relocate large boulders. There is little evidence of fine alluvial sediments in either the bed or banks.

There has been obvious change to this site over the last 10 years with changes to the banks and vegetation cover influences by water flow velocity. This level of change can only occur during high flow events which have not emanated from the mine. These flows are natural and a result of heavy rainfall. The site is mainly composed of cobble sized rocks 30-50cm in diameter. The flow velocity has reduced over the last 12 months, allowing for the growth of macrophytes within the creek bed.

Plate 2 shows the Barbers Creek Downstream site. There are less boulders in this section of creek and the bed and banks have a high concentration of finer sediment. Sediment is likely derived from upstream channel material, local bedrock weathering and valley-side erosion, with coarse material transported through the steep channel and temporarily stored within pools, shallow margins and behind bedrock and boulder controls. The banks show evidence of colonizing vegetation species returning. There are some weed grasses occurring in the finer sediments.

The creek flow path divides in low flow due to the high level of bed sediments and the greater percentage of lower flow velocities. Although erosion potential is high, this stretch of the creek is generally depositional. There have been some overall changes to the creek line over the past few years but these are less dramatic than the upstream sample site. This is largely a function of greater cross sectional area available downstream which slows velocities to great a depositional environment. The inspections have not identified anything other than natural processes causing the depositional environment.

### 3.2.2 Bungonia Creek

As shown on Plate 3 and 4 of Appendix A, Bungonia Creek is strewn with boulders and pools. It runs through a steep sided narrow gorge for approximately 8.5 km upstream of the Shoalhaven River. The slope of the creek channel in the monitored section is approximately 4%. Bungonia Creek is also a fifth order stream at the junction of the Shoalhaven River.

The River Style of Bungonia Creek adjacent to the Project is Confined Valley Setting – Gorge (CVS-Gorge). The Bungonia Creek catchment is about three times larger than that of Barbers Creek and therefore has sufficient flow during large floods to mobilise larger boulders.

Plate 3 shows the Bungonia Creek Upstream site. This site is characteristically filled with very large boulders which control the flow pathways and produce a sequence of shallow runs/riffles and deeper pools. Some of these boulders have fallen down the tallus slopes rather than being relocated down the river bed. These is a mixture of medium size rocks surrounded by coarse sediments showing alternating depositional and erosive episodes over time. The banks are coarse grained but still representative of an erosive surface. The boulders provide some energy dissipation which has allowed some finer sediment to be deposited at the upstream side. The banks show high lateral stability, with little evidence of channel widening.

At the Bungonia Creek Upstream site, the banks are generally well vegetated with over 50% coverage and less than 10% exotic grasses. There was a healthy amount of macrophyte coverage along the edge of the creek bank during June 2026.

Plate 4 shows the Bungonia Creek Downstream site. This section of the creek is wider but still dominated by large, relatively stable boulders and cobbles, while finer gravel is stored locally in low-energy areas. There are also sections which occur on bedrock, and there is little evidence of deposition of finer sediments. The below average rainfall over the last 12 months has contributed to lower surface water flows within Bungonia Creek. This has resulted in greater exposure of boulders and more isolated pools of water.

The riparian vegetation is young but healthy, with evidence of regrowth since a prior erosional phase. The riparian banks are relatively well vegetated with predominantly native vegetation of up to 80% cover, providing additional bank stability. The combination of resistant coarse substrate, large boulders, rocky valley confinement and established riparian vegetation suggests a channel with low susceptibility to large-scale lateral adjustment, although individual pools, gravel bars and smaller sediment deposits may be periodically reworked during elevated flows. There appears to have been very little change over the past three years.

### 3.2.3 Shoalhaven River

The Shoalhaven River is shown on Plates 6, 7 and 8. In its reach mid-way between Bungonia Creek and Barbers Creek, it consists of a wide channel with sandy banks indicating significantly lower velocities than those experienced in Bungonia Creek and Barbers Creek.

The Shoalhaven Upstream site is shown on Plate 6. Although most of the channel is wide, the banks show typical sandy deposition on one side and bedrock controlled outer channel. This part of the river is characteristic of extensive exposed bedrock and large angular boulders. Woody debris is abundant along the banks, which can help with sediment retention. Sediment in this area is mostly coarse and locally stored within depressions, and along pool margins, with finer material accumulating around logs and vegetation on the margins. On depositional banks, native vegetation is over 90% with little evidence of recent erosion. Outer banks show some evidence of past erosion, but these have generally grassed over and are now stable. A large amount of blackberry is beginning to spread over the area between the SR1 site and the confluence of Bungonia Creek.

Further downstream at the SR2 site (Plate 7), the river enters a straight section where both banks have finer grained sand and silt deposits and less continuous bedrock exposure. The channel remains strongly valley-confined, but this location has a wider, deeper pool. There is a greater development of coarse alluvial material compared with the upstream site SR1 bedrock-dominated site which shows increased local sediment storage at this site. Native vegetation cover extends over the bank to the river bed in many places and is considered stable, although localised bank erosion, exposed roots and previous sediment deposition are evident. There has been little evidence of any change over the past four years.

Further downstream, the SR3 site occurs on a gentle bend in the river. The inside channel (western side) shows slightly more deposition than the outer eastern channel surface which is rockier and with coarser grained sediments. This site shows considerably more longitudinal variation than was apparent at the upstream sites defined as broader pools. This furthermost downstream site is a confined, narrower, pool–riffle/run channel with a mixed bedrock and coarse

alluvial bed, extensive riparian vegetation, and substantial local sediment storage. There are numerous areas of riffle flow through the channel at this location, with large rocks submerged just below the surface of the water. The sediment is noticeably more rounded than the angular rock material observed at the upstream Shoalhaven site, showing that the material has undergone fluvial transport and abrasion. Both banks are stable with above 90% of dense, continuous native vegetation cover and little evidence of previous erosion events. There is also substantial ground-layer vegetation, including dense tussock-forming plants along the immediate bank, as well as woody debris which contributes to the development and maintenance of local pools and sediment deposits.

# 4. Conclusions and Recommendations

## 4.1 Conclusions

This study has presented the results of water quality and riverine health monitoring for the period ending 30 June 2026. The water quality results show that upstream and downstream water quality varies throughout the year but generally follow a correlated trend, that is, elevated elements downstream are caused by elevated levels upstream. The only variation to this occurs in Bungonia Creek where nutrients, particularly Nitrogen are higher downstream compared to the upstream site. This variation is caused by the groundwater discharge from the Blowhole site rather than the mine.

The higher nutrients from the Blowhole site are not causing a measurable change in the quality of the Shoalhaven River, however the origin of the water discharged from the Blowhole, which predates the mine, is unknown.

River health studies indicate that the receiving waters of Bungonia Creek are naturally actively eroding upstream of the mine site but become more depositional towards the confluence of the Shoalhaven River. There have been several significant changes to the bed and banks of Bungonia Creek towards the confluence with the Shoalhaven River over recent years, reflecting the impact of extreme storm events.

Barbers Creek is erosion controlled for its full length adjacent to the mine. This stretch is steep sided and prone to extreme velocities during storm events. There has been evidence of sediment movement, but the health of vegetation and the overall nature of the creek line has not changed over the past four years. Although some sediment would have been derived from rehabilitated slopes, the movement of sediment downstream is a natural process which is necessary to maintain a healthy river system.

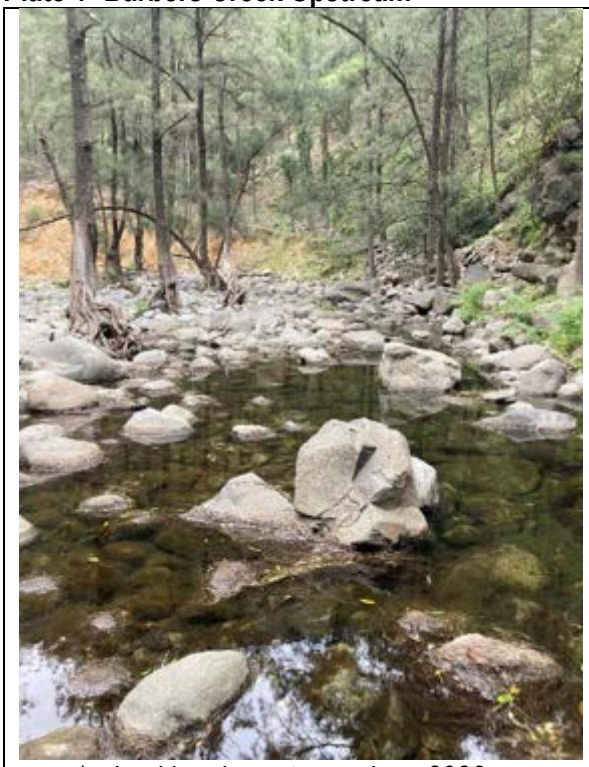
Photographic evidence of the three sites along the Shoalhaven River show little if any evidence of increased sedimentation. Riparian vegetation has remained healthy and no new bank erosion or instability has been detected.

## 4.2 Recommendations

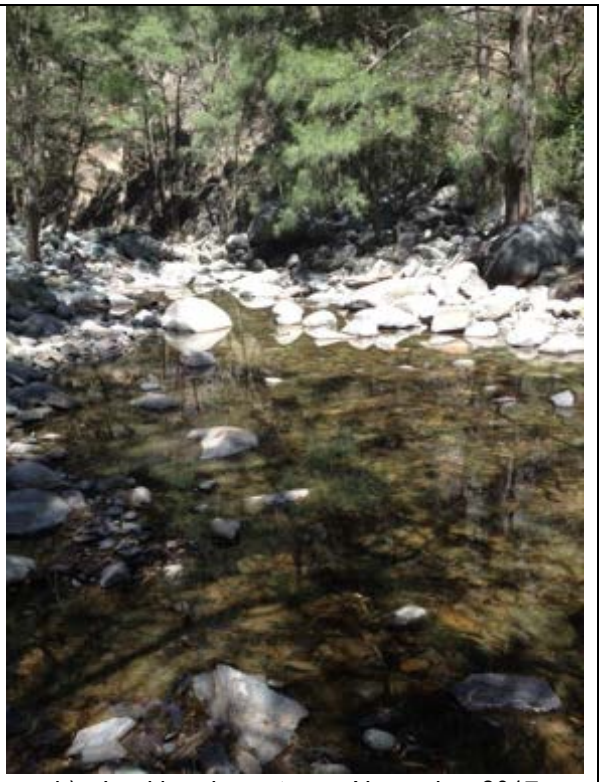
Three more years of data has been collected since the MSL Water Management Plan was last revised. A revision would be helpful to update site specific water quality trigger values.

# Appendix A –Photographic Record

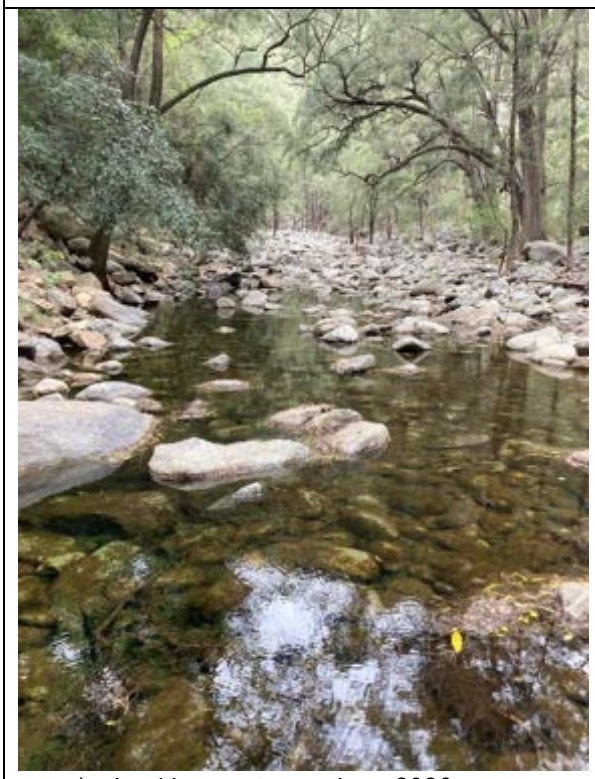
**Plate 1- Barbers Creek Upstream**



a) Looking downstream June 2026



b) Looking downstream November 2017



c) Looking upstream June 2026



d) Looking upstream May 2019

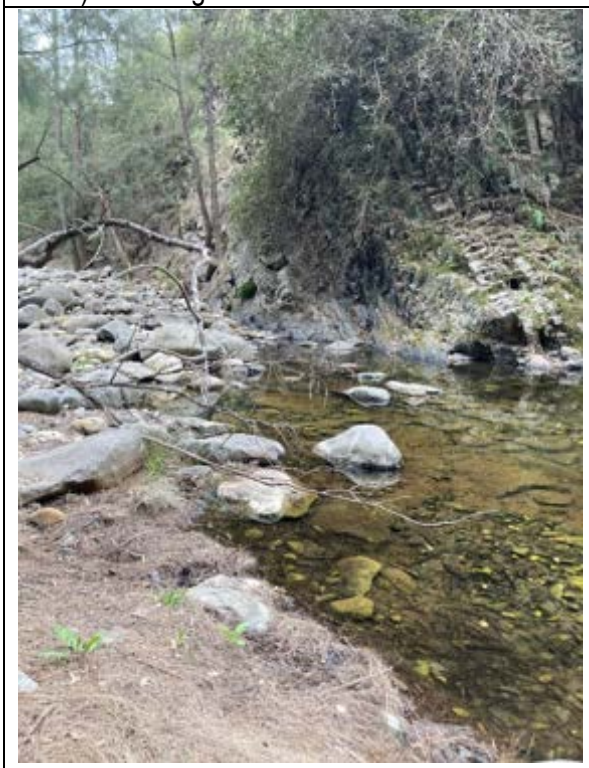
**Plate 2- Barbers Creek Downstream**



a) Looking downstream June 2026



b) Looking downstream October 2020



c) Looking upstream June 2026



d) Looking upstream October 2020

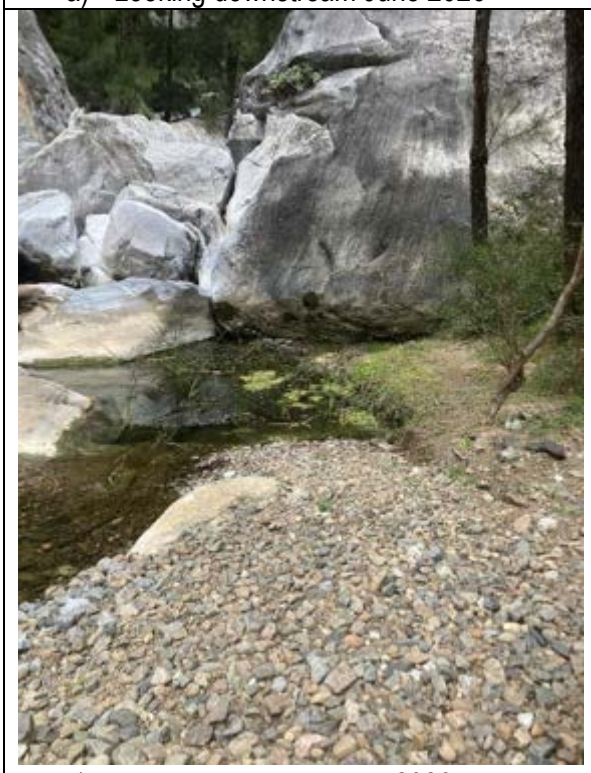
**Plate 3- Bungonia Creek Upstream**



a) Looking downstream June 2026



b) Looking away from site October 2020

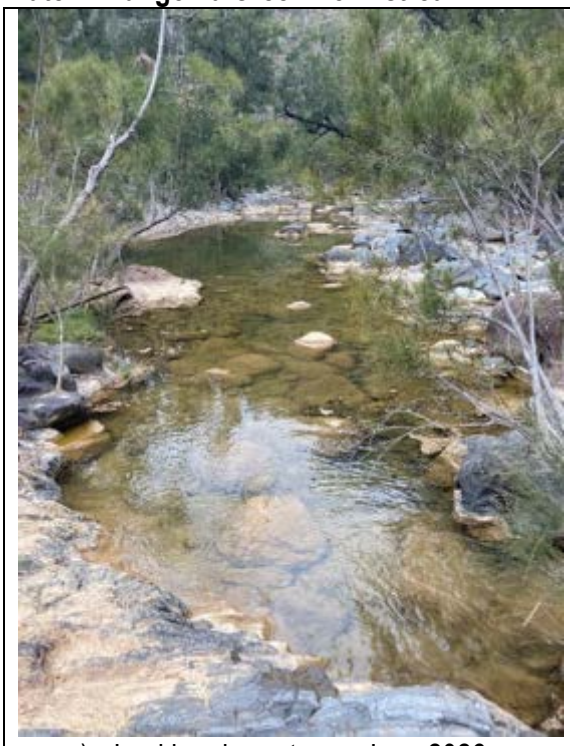


c) Looking upstream June 2026



d) Sample site October 2020

**Plate 4- Bungonia Creek Downstream**



a) Looking downstream June 2026



b) Looking across the sample site October 2020



c) Looking upstream June 2026



d) Looking upstream October 2020

**Plate 5- Blowhole**



a) Towards Bungonia Creek June 2026



b) Looking across flow path March 2020

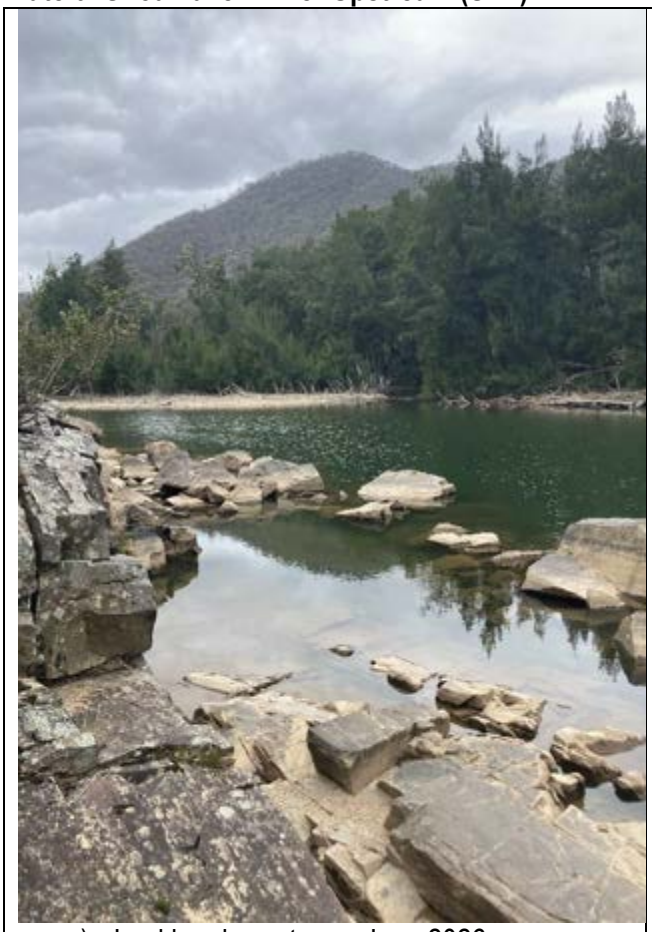


c) Looking toward blowhole June 2026



d) Toward blowhole November 2017

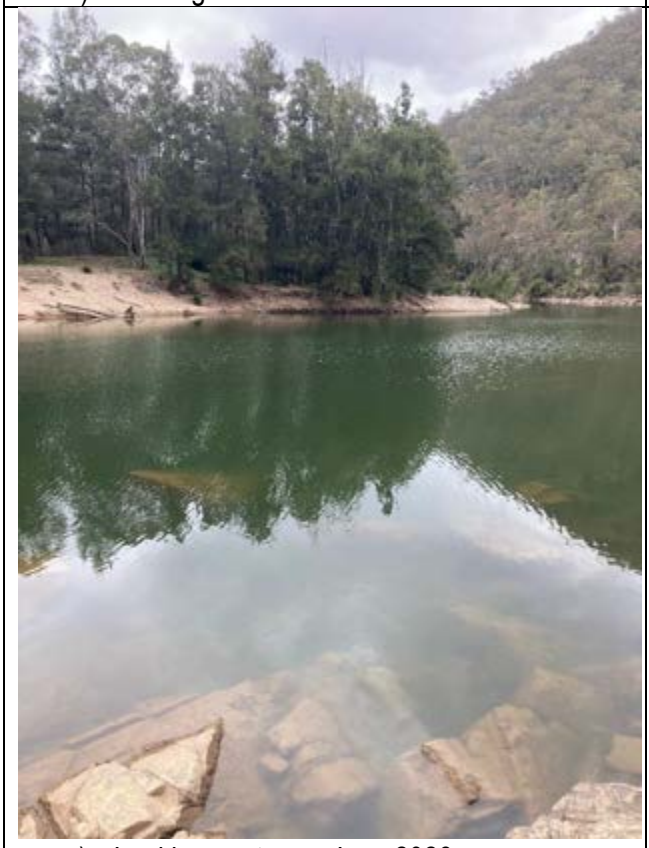
**Plate 6- Shoalhaven River Upstream (SR1)**



a) Looking downstream June 2026



b) Looking downstream June 2019



c) Looking upstream June 2026



d) Looking upstream Oct 2020

**Plate 7- Shoalhaven River (SR2)**



a) Looking downstream June 2026



b) Looking downstream May 2019



c) Looking upstream June 2026



d) Looking upstream March 2020

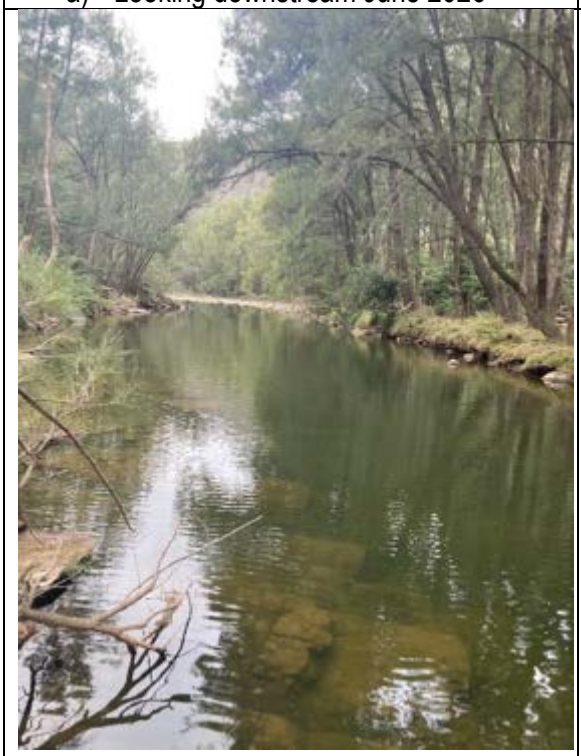
**Plate 8- Shoalhaven River Downstream (SR3)**



a) Looking downstream June 2026



b) Looking downstream March 2020



c) Looking upstream June 2026



d) Looking upstream October 2020

**Plate 9 – Barbers Creek Tributary**



a) Tributary June 2026



b) Tributary June 2024

# APPENDIX 3

## ANNUAL GROUNDWATER REPORT

August 2026

# Annual Groundwater Report for Marulan South Limestone Mine (2025/2026)

Report prepared for Boral Pty Ltd

Report No KD2027/08

Katarina David
RPGEO (HYDROGEOLOGY) 10060

DOCUMENT REGISTER

| Revision | Status | Date | Comments/Review |
|---|---|---|---|
| 0 | Draft | 31/08/25 | |
| 1 | Final | 23/09/2026 | |
| | | | |



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Appendix A Time series groundwater data for pH and EC
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# 1 OBJECTIVE AND SCOPE

This annual groundwater report for 2025/2026 was prepared for Marulan South Limestone Mine (the Mine) in accordance with the Marulan South Limestone Groundwater Management Plan (GWMP) (2021) and commitment to complete annual environmental reporting of which groundwater is part of.

The report is prepared as part of the CoC D11, where "*report will be submitted to DPIE reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary*". By the end of July each year after the commencement of development the performance measures from Table 4, Condition B43 of the development consent are applicable as part of GWMP (2021). The report needs to include a detailed assessment of monitoring results, an evaluation of any trends occurring across the Mine, any community/stakeholder complaints or non-conformances with licences/criteria and recommendations for management actions.

The following is required for annual groundwater report:

- review and analyse groundwater levels using monitoring data from the Mine's monitoring network and the Peppertree Quarry groundwater monitoring network. Prepare hydrographs, groundwater flow maps, identify trends.
- review and analyse groundwater quality data from the Mine bores and provide comparison to baseline conditions (collate data, generate time series plots, compare time series data between bores and identify trends)
- review of groundwater inflow and pumping during the year and relevant water access licences
- review of groundwater dependent ecosystems (GDE) and spring monitoring
- check for exceedances and trigger levels as part of the TARP
- Recommendation for management action (if required)

Section 9.1 of Groundwater Management Plan (GMP) requires that trigger levels be reviewed considering all groundwater monitoring data. This was undertaken in November 2025, ~~and a report sent to DCCEEW.~~ No response has been received as yet, therefore this annual groundwater report uses existing approved trigger levels in the GMP , although the data on which they are based represents only small dataset.

As part of this requirement a review of groundwater conditions across the Marulan South Limestone Quarry (the Mine) (MSLM) is undertaken, compared to historically collected information and trigger levels set in the GWMP. The report also provides recommendations for future management.

# 2 INTRODUCTION

## 2.1 Background

MSLM is located 10 km south-east of Marulan village and 35 km east of Goulburn (**Figure 1**). It is in the Goulburn Mulwaree Local Government Area (LGA). The mine is separated from the Bungonia

National Park (NP) and State Conservation Area to the south by Bungonia Creek and is separated from the Shoalhaven River and Morton NP to the east by Barbers Creek.

The Mine and surrounds are characterized by rolling hills of pasture interspersed with forest to the west, contrasting with the heavily wooded, deep gorges that begin abruptly to the east of the mine, forming part of the Great Escarpment and catchment of the Shoalhaven River.

Boral Cement Limited (Boral) owns and operates the Marulan South Limestone Mine (the mine), an open cut mine. Limestone mining north of Bungonia Gorge began around 1830 with major developments emerging in the 1920s to supply limestone for cement manufacturing and steel making. The mine produces up to 3.38 million tonnes (Mt) of limestone-based products per year for the cement, steel, agricultural, construction and commercial markets. Development consent (the consent) was granted by the Department of Planning, Industry and Environment (DPIE) on 19 August 2021, to continue mining limestone at a rate of up to 4 million tonnes per annum (Mtpa) for a period of up to 30 years (the Project).

Historically limestone mining was focused on the approximately 200-400 m wide Eastern Limestone and was split between a north pit and a south pit. A limestone wall (referred to by the mine as the 'centre ridge') rising almost to the original land surface, divided the two pits. The north and south pits were joined in 2016/2017 by mining the centre ridge to form a single contiguous pit, approximately 2.5 kilometres (km) in length. However, the north pit/south pit nomenclature remains important as current mining operation locations continue to be reported with respect to one or other of the old pits. Limestone and shale are extracted using open-cut hard rock drill and blast techniques. Limestone is loaded using front end loaders and hauled either to stockpiles or the processing plant using haul trucks.

Consent was granted for a 30-year mine plan accessing approximately 120 Mt of limestone down to a depth of 335 m. The mine footprint focuses on an expansion of the pit westwards to mine the Middle Limestone and to mine deeper into the Eastern Limestone. As the Middle Limestone lies approximately 70-150 m west of the Eastern Limestone, the 30-year mine plan avoids mining where practical the interburden between these two limestone units thereby creating a smaller second, north-south oriented west pit with a ridge remaining between. The north pit will also be expanded southwards, encompassing part of the south pit, leaving the remainder of the south pit for overburden emplacement and a visual barrier.

Limestone will be extracted at up to 4 Mtpa for 30 years until 31 August 2051. Clay shale will also continue to be extracted at up to 200,000 tonnes per annum (tpa).

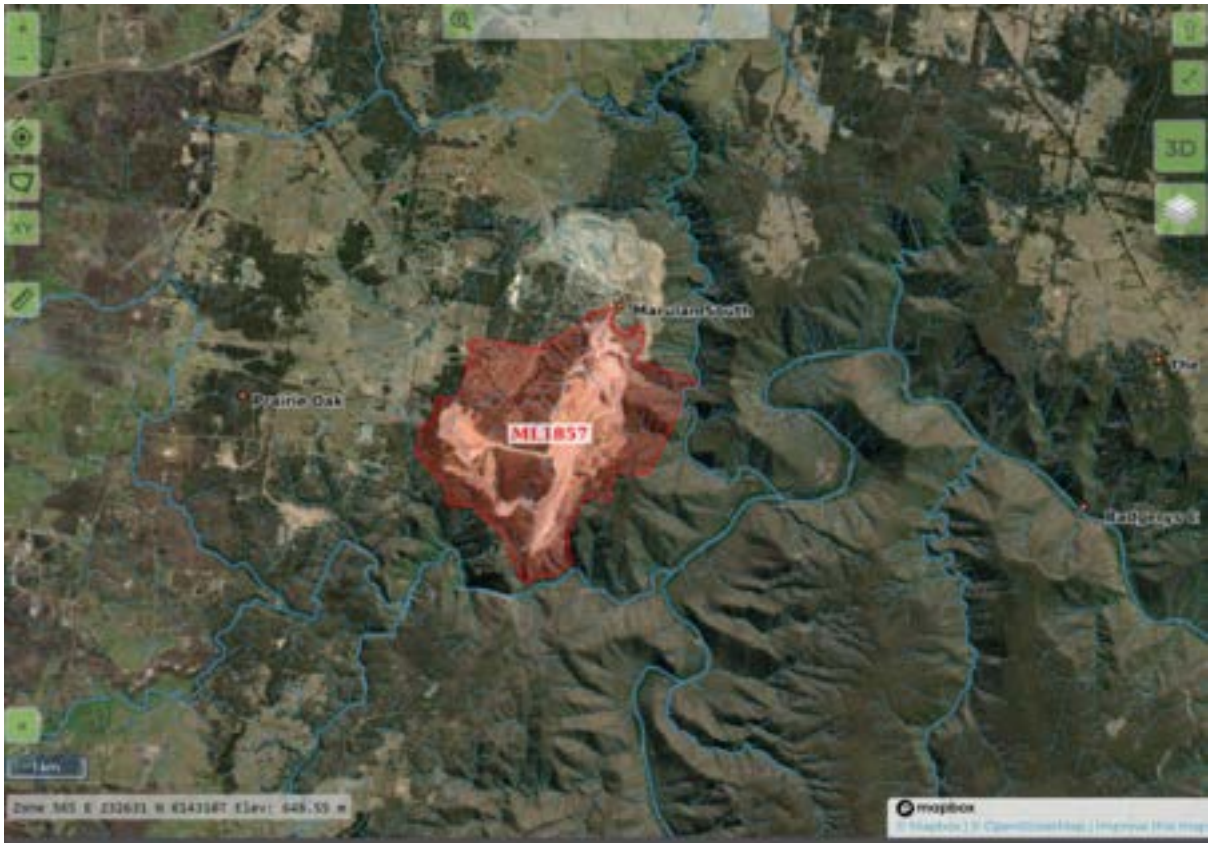



**Figure 1 Location map of Marulan South Limestone Mine**

## 2.2 Environmental Values

The GDE and water quality guidelines outline water quality objectives to enhance and protect environmental values and apply to groundwater and surface expression of groundwater. **Figure 2** provides the overview of all potential receivers relative to the location of the Mine. Most receivers are located over 500 m from the MSLM boundary, mainly to the west, while environmental receptors are located to the south and east (**Figures 4 and 5**). **Figure 3** shows the groundwater users within the proximity to the Mine mainly located to the west and northwest.

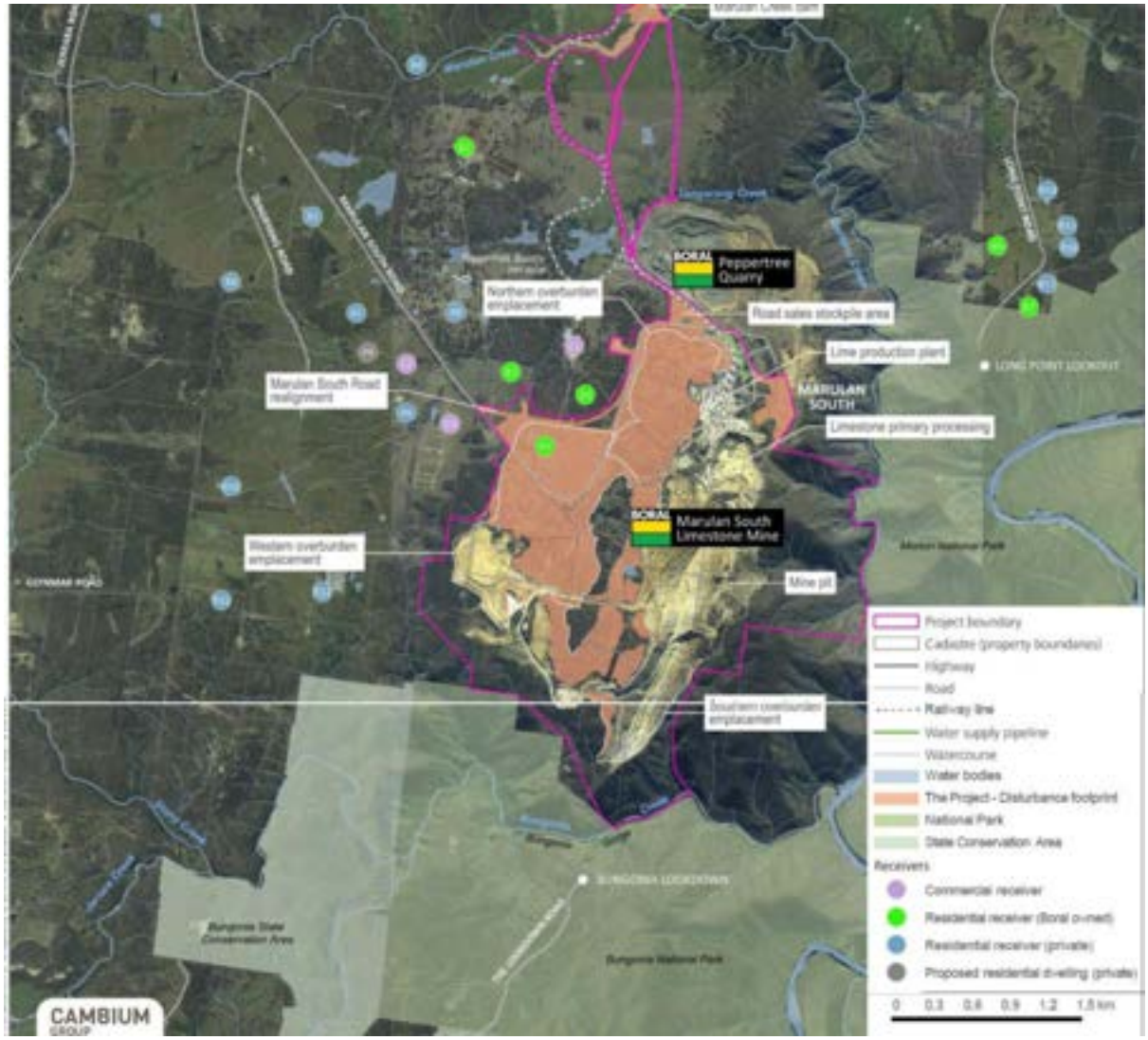



**Figure 2 Potential receivers as identified in the EIS**

NSW DoI Water has adopted the Guidelines for Identifying High Ecological Value Aquatic Ecosystems (HEVAE) framework developed by the Australian Commonwealth Government. In the current assessment for NSW, the HEVAE consists of four key criteria which include diversity, distinctiveness, naturalness and vital habitat. Therefore, the HEVAE vegetation GDE value layer is a combination of four individual criterion layers. The final or overall HEVAE score was determined for vegetation PCT polygons which has a high probability of being groundwater dependent. Review of HEVAE indicates that medium value GDE HEVAE exists to the south and east of the Mine and high value GDE HEVA (**Figure 4**) to the south of the Mine..

Bungonia Creek located to the south and flowing to the east, is fed by springs and seepages originating from the limestone aquifer and flow in the creek is therefore indirectly connected to the limestone aquifer. An example of this process can be observed in two small caves known as Main Gully Spring (B68 - locally referred to as the 'Blowhole') and Main Gully Spring Too (B128), located within the northern escarpment of the Bungonia Gorge, south of the mine. These springs are regarded as groundwater dependent ecosystems (GDEs).

Limited alluvial sediments are associated with the Barbers creek (to the east of MSLM and flowing north to south) and Bungonia creek lines due to their steep and rocky nature (**Figure 3**). Alluvial

deposits occur closer to and along the Shoalhaven River, situated further to the east. No alluvial aquifers occur within the current and proposed mining area on the plateau.

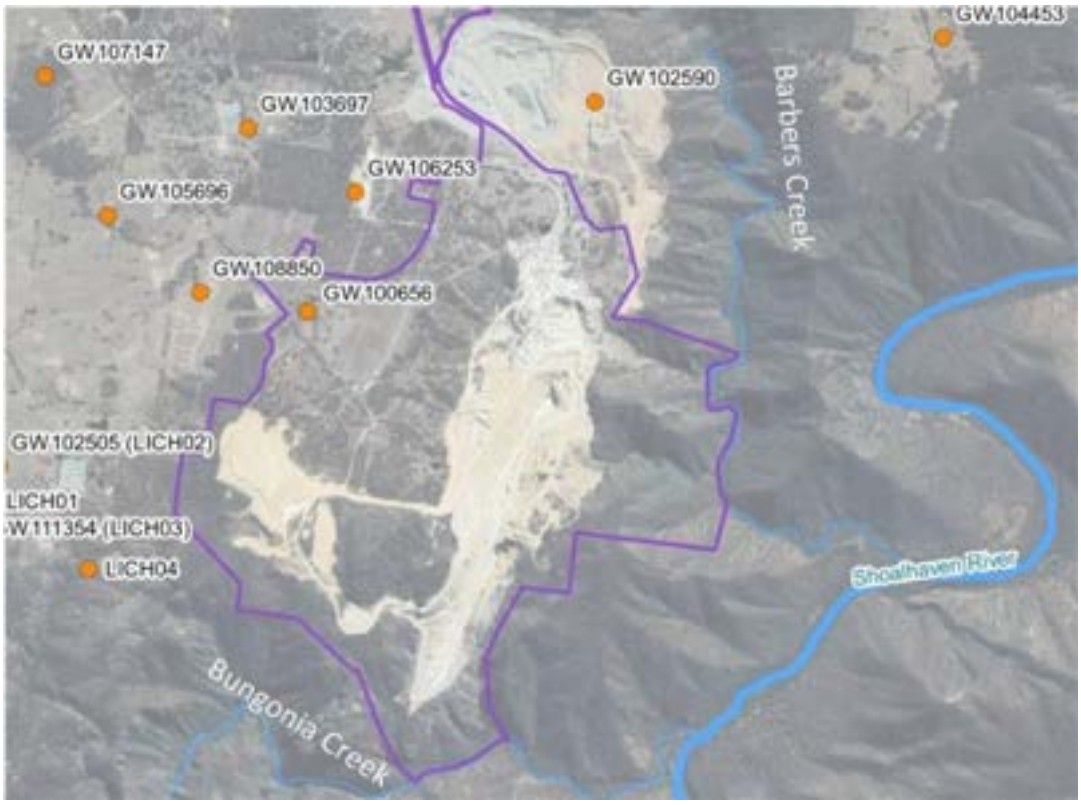



**Figure 3 Location of regional groundwater users**




**Figure 4 GDE HEVAE within the vicinity of the Mine (Seed Database, 2026)**

## 2.3 Climate

Average rainfall is summarized in **Table 1**. Peak rainfall occurs in the summer months, with slightly lower rainfall in winter. Rainfall is highly variable ranging from a minimum of zero in a month up to a

maximum of 407 mm. In wet (90th percentile) years the annual rainfall can be up to 847 mm while in a dry (10th percentile) year it can be as low as 455 mm. During 2025/26 rainfall was above average and median at 796 mm, however July to September were above average, October to December below average and January 2026 to March 2026 above average.

**Table 1 Average annual rainfall (source BOM station 70063)**

| | *Jul* | *Aug* | *Sep* | *Oct* | *Nov* | *Dec* | *Jan* | *Feb* | *Mar* | *Apr* | *May* | *Jun* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average*** | 50 | 47 | 46 | 61 | 62 | 63 | 68 | 73 | 71 | 52 | 54 | 64 |
| ***Median*** | 31 | 34 | 38 | 47 | 55 | 55 | 58 | 56 | 52 | 36 | 32 | 44 |
| ***Station 70063 July 2025/June 2026*** | *Jul* | *Aug* | *Sep* | *Òct* | *Nov* | *Dec* | *Jan* | *Feb* | *Mar* | *Apr* | *May* | *Jun* |
| ***Rainfall monthly*** | 112 | 109.5 | 81 | 21.5 | 46.5 | 19.5 | 137.5 | 78 | 100.5 | 7 | 69 | 14 |

Statistics of monthly pan evaporation for Marulan (1969 – 2021) are provided in **Table 2**. Pan Factor is applied to pan evaporation to estimate potential evaporation from water bodies, such as the mine water dams on the Mine.

**Table 2 Monthly pan evaporation (mm)**

| | *Jan* | *Feb* | *Mar* | *Apr* | *May* | *Jun* | *Jul* | *Aug* | *Sep* | *Oct* | *Nov* | *Dec* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Average*** | 143 | 101 | 92 | 53 | 43 | 29 | 33 | 32 | 68 | 93 | 105 | 127 |
| ***Median*** | 190 | 145 | 123 | 83 | 56 | 40 | 47 | 70 | 97 | 128 | 150 | 179 |

## 2.4 Regional and local hydrogeology

The main groundwater system within the Marulan South Limestone Quarry is the limestone ore body targeted for mining (AGE, 2012). Fracture networks and vertical bedding allow vertical groundwater flow and connect with karst seepage zones that form springs surfacing within the Bungonia Gorge (e.g. on the gorge slopes). Less permeable rock units bound the limestone and slow down lateral groundwater flow with fine-grained siltstones and sandstones present to the east towards the gorge and a sequence of volcanic units to the west.

GeoRes (2017, 2018) described the limestone currently and historically mined at Marulan South as two sub-parallel and steeply west dipping members of the Bungonia Limestone Group. These include the upper 'Mt. Frome Limestone' (formally the 'Folly Point Limestone' member) and the lower 'Eastern Limestone' (formally the 'Lookdown Limestone' member). The Mt. Frome Limestone comprises three separate limestone units: the Upper, Middle, and Lower Limestone. Each limestone unit is separated by fine-grained sediments such as mudstones, siltstones and sandstones.

To the west, the limestone is overlain by series of volcanoclastic and intrusive units composed of dacites, tuffs and volcanic breccias. All geological units dip towards the west-north-west with variable degree of steepness (GeoRes, 2018). To the south, the limestone units extend south beyond Bungonia

Creek, and to the north, the Glenrock Granodiorite intrusion truncates the limestone (**Figure 5**). The granodiorite has also metamorphosed the limestone to varying degree across the Mine.

There are two hydrostratigraphic units within and adjacent to the mine's rock units, including:

- shallow, unconsolidated zone - The shallow unconsolidated aquifer is mainly within the weathered zone where the groundwater exists in the pore spaces within the sediment or regolith.
- deep, consolidated zone - Groundwater within the deep, bedrock aquifer is present and moves mainly in rock fractures caused by geologic and structural movement

The limestone is intruded with a number of dykes, both parallel and perpendicular to the strike of the limestone body. Based on Mine site observation data, the dykes oriented perpendicular to the limestone strike appear to act as hydraulic barriers, as evidenced by groundwater levels varying considerably on either side of the dykes (AGE, 2019).

Regionally, groundwater level measurements indicate flow is generally toward the east-south-east towards the deeply incised gullies of Bungonia and Barber's Creeks. The groundwater gradient across the Project area is influenced by geology changes, which often mark changes in hydraulic properties on a local and regional scale. The main groundwater recharge zones are in topographically elevated areas on the plateau and occur through diffuse recharge. Recharge on the plateau also occurs as seepage through creek and riverbeds when flowing. The mine pit also presents a groundwater recharge zone where runoff collects during rainfall events on exposed fractured limestone.

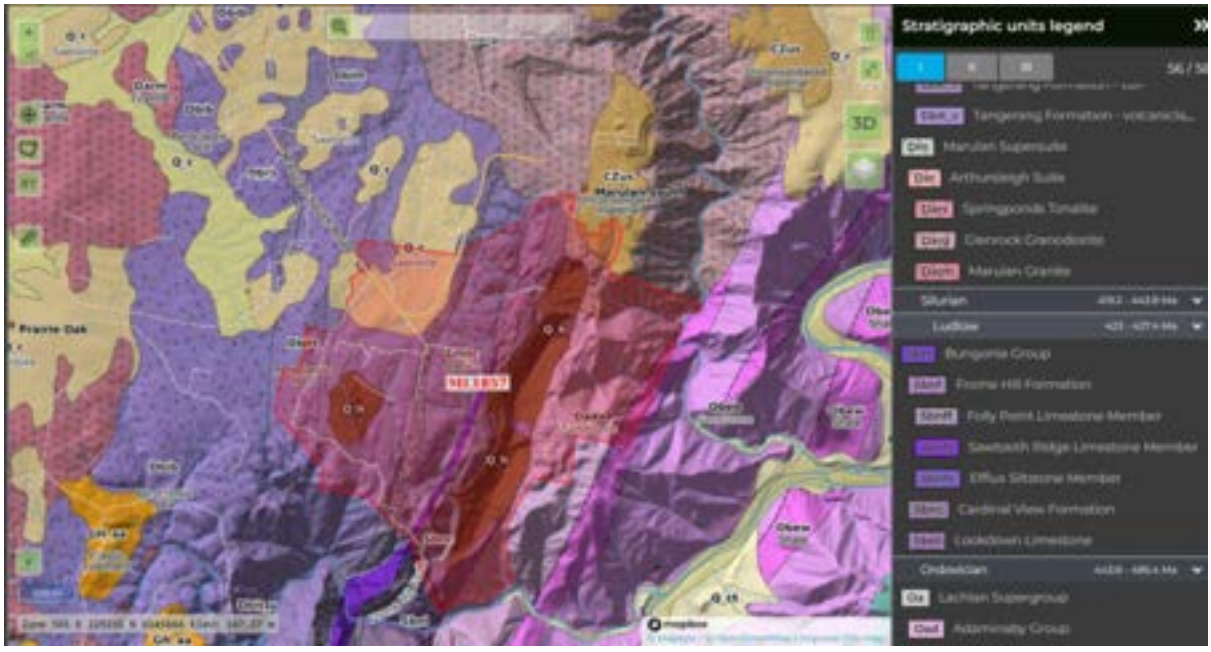



**Figure 5 Geology map ( Minview, 2025)**

## 2.5 Regulatory requirements and licences

Groundwater sources in the Project area are managed under the 2023 Greater Metropolitan Region Groundwater Sources Water Sharing Plan (WSP). Under this WSP, the Project area falls entirely within

Lachlan Fold Belt Greater Metropolitan Groundwater Source. Based on the AIP, the aquifer is classified as a 'less-productive" groundwater source.

Development consent requirements require the performance and management measures to be addressed and monitored as per GWMP in regard to the:

- Barbers Creek, Bungonia Creek, Shoalhaven River alluvial aquifers; and
- Groundwater springs.

The mine has Water Access Licences (WALs) issued under the Water Management Act (2000). **Table 3** summarises the licenses held by Boral. Boral is in the process of linking all works approval to WAL41976.

Under this WSP , there is a non-urban water metering framework in place, which requires that December 2024 all licence holders with bore diameters of 200 mm or larger need to have bore equipped with a meter that is pattern approved , has a local intelligence devise (LID) and tamper evident seals .

**Table 3 Water access licences**

| *WAL number* | *Works approval* | *Water sharing plan/source* | *Entitlement (ML)* |
|---|---|---|---|
| ***WAL2697**** | 10WA116141 and 10WA116142 | Goulburn Fractured Rock Groundwater Source | 12 |
| ***WAL41976*** | 10WA124508<br>Bore GW117345 | Greater metropolitan region groundwater sources 2023/ Lachlan Fold Belt Greater Metropolitan groundwater source | 838 |
| ***Total*** | | | 850 |

* issued but no longer active, all work supply linked to WAL41976

# 3. GROUNDWATER LEVELS

## 3.1 Groundwater monitoring network and program

The groundwater monitoring program at the MSLM was established in 2016 and includes collection of groundwater level and quality data. The monitoring network is as follows:

- Quarterly manual and continuous datalogger monitoring of six standpipe monitoring bores – including 2 new bores installed in 2025. One of the standpipe locations include a shallow and deep installation each.
- Monitoring in MW03S and MW03D bores has been discontinued as of March 2025. The logger in MW03s was not reinstalled as the bore was decommissioned.
- Water quality sampling of all Mine site bores on a six-monthly basis with exception of MW05 which is monitored quarterly.

A water level dataset with ten years of monitoring now exists and provides a comprehensive understanding of the water level fluctuation over time in response to recharge. There is limited data available for limestone aquifer as there is one bore currently installed in this unit and due to characteristics of the limestone aquifer which includes voids.

Manual standing water levels and electronic pressure logger data are converted to a reduced water level with respect to Australian heigh datum (m AHD) and hydrographs presented in figures below. **Figure 7** shows all currently active MSLM monitoring, production bores and surface water locations.

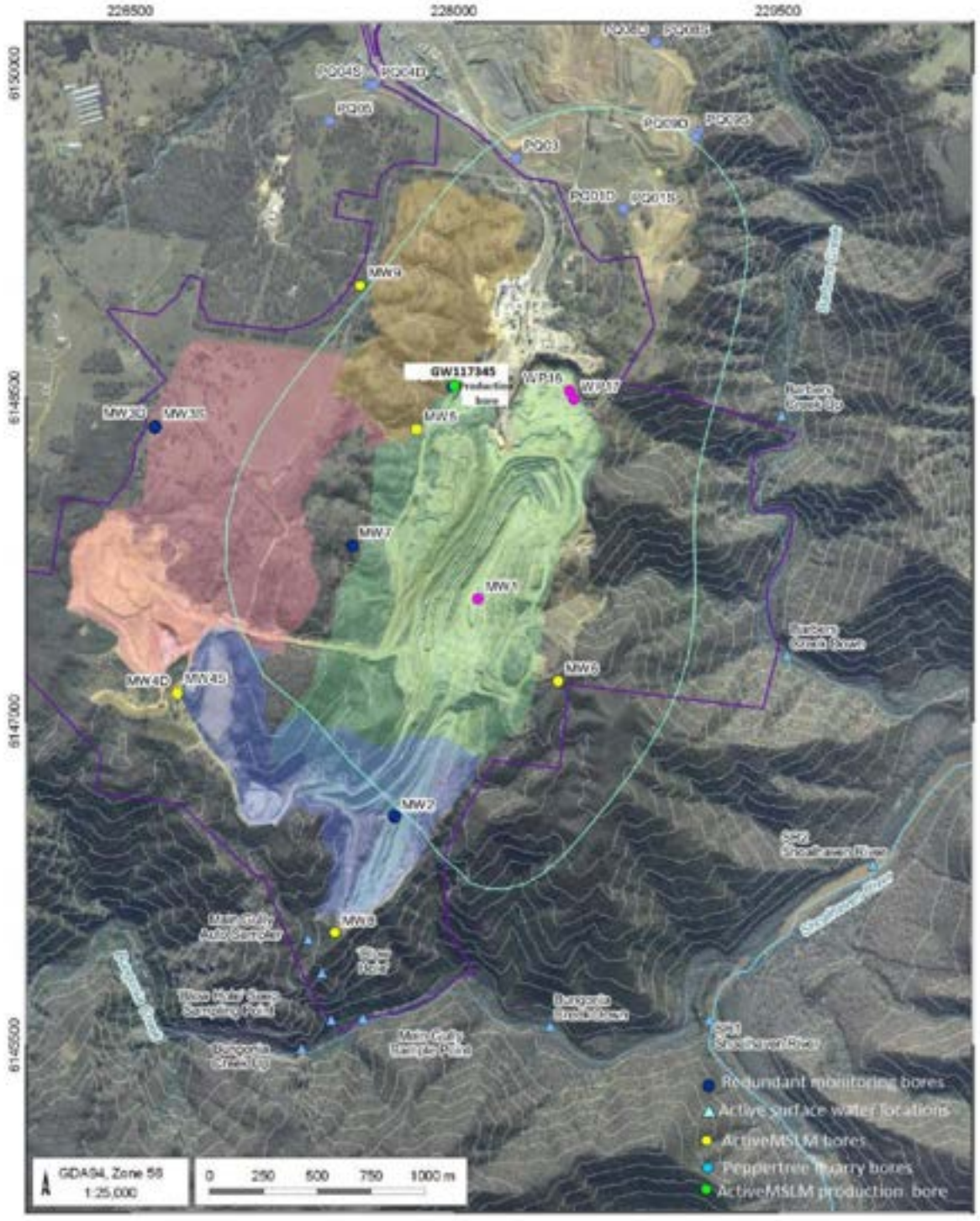



**Figure 6 Location of groundwater monitoring bores (2025/2026)**

The aim of the groundwater monitoring program is to provide an understanding of the behaviour of the groundwater system and to provide early warning signs of any potential impact the Mine development may have on the environment. **Table 4** provides a summary of monitoring bores and monitoring schedule.

**Table 4 Summary of groundwater monitoring network 2025/2026 at MSLM**

| *Monitoring bore* | *Total monitoring bore depth (mbgl)* | *Screened Hydrostratigraphic unit* | *Screened formation (mbgl)* | *Continuous Datalogger Monitoring* |
|---|---|---|---|---|
| ***MW04s*** | *40* | *Weathered granite* | *26-38* | *Yes (6 hourly readings)* |
| ***MW4d*** | *124* | *Fractured granite* | *83-123* | *Yes (6 hourly readings)* |
| ***MW05*** | *98* | *Weathered granite* | *73-97* | *Yes (6 hourly readings)* |
| ***MW06*** | *128* | *Fractured granite* | *109.5-127.5* | *Yes (6 hourly readings)* |
| ***MW08*** | *94* | *Limestone* | *76-91* | *No* |
| ***MW09*** | *101* | *Weathered to fresh granodiorite* | *86-101* | *Yes (6 hourly readings)* |

* To be confirmed, may not be accurate

## 3.2 Piezometric head measurements and trends

Manual water level measurement in all bores were undertaken by IEC during the year on a six-monthly basis along with data download.

Continuous datalogging in all bores was undertaken during the period from June 2025 to June 2026. A barometric datalogger is installed in one of the bores on the Mine to measure the accurate atmospheric pressure. Sampling and testing of all bores was undertaken in June 2026 as part of the preparation of this annual report.

The dataloggers installed across the Mine measure the absolute pressure including the atmospheric pressure that acts on the water column in the bore. The atmospheric pressure fluctuations (20 to 30 mbar) can result in significant piezometric head fluctuations in monitoring bores depending on the barometric efficiency of the bore (up to 20 cm change in piezometric head). Piezometric head data presented in this report have therefore been corrected and barometric pressure removed. This was undertaken such that any influence on groundwater, for example, the impact from quarry development can be identified.

Groundwater monitoring data for this monitoring period were compared with historical data (**Figure 8**). **Table 5** lists maximum, minimum and average piezometric heads over this current monitoring period. Grey highlighted are exceedance of trigger level.

**Table 5 Piezometric heads variation over 2025/2026 monitoring period (mAHD)**

| *Monitoring bore* | *Trigger level 5th %* | *Minimum level* | *Maximum level* | *Average* | *Comment* |
|---|---|---|---|---|---|
| ***MW04s*** | *564.25* | *568.16* | *569.13* | *568.6* | |
| ***MW4d*** | *547.02* | *550.3* | *551.7* | *551.1* | |
| ***MW05*** | | *502.7* | *506.11* | *504.5* | |
| ***MW06*** | *468* | *465.5* | *469.44* | *468.7* | |
| ***MW08*** | *TBC* | *336.0* | *336.4* | *336.3* | |
| ***MW09*** | *TBC* | *598.0* | *598.3* | *598.15* | |

Historically groundwater levels fluctuated within a range of several meters for all bores, with the exception of MW05 where the level has decreased by 45 m over the past 12 years (**Figure 8**). Over the past year (covered by this report) groundwater levels fluctuation was mainly around 1 m with the exception of MW05 and MW06 where 4 m fluctuation was recorded (**Table 5, Figure 9)**. Paired bores MW04 indicate increasing (from last monitoring period) vertical hydraulic gradient of 21 m between shallow and deep bore and a downward gradient.

Groundwater level in MW05 continues a decline as observed since 2018. The decline is likely due to pumping in GW117345 which is located in the proximity of the monitoring bore. However, pumping has decreased significantly over the past year and was about 50% of that produced last reporting period. MW08 installed in limestone aquifer in March 2025 remained dry since installation.

Compared to historical data, groundwater level fluctuated in monitoring bores over a slightly bigger range over this reporting period likely due to drier and wetter weather pattern.

Based on the groundwater levels within the weathered and fractured granite/granodiorite and interpreted groundwater contours, groundwater flow direction is interpreted to the east and south-east (**Figure 10**). This is consistent with the baseline readings as reported in GWMP (AGE, 2021) and similar to previous annual report.

Groundwater level data for 2025/2026 has been compared to trigger levels (**Table 5**). MW06 was the only bore which recorded levels below 5$^{th}$ % trigger level. However, this occurred in August and December 2025 and does not represent the consecutive event, therefore, trigger level event did not occur. Groundwater levels in MW06 in December are due to below average rainfall, and it is not clear what the lower levels in August can be attributed to as rainfall was above average during this time.

Groundwater flow direction is generally from the west to the east (**Figure 10**), with limestone bore MW08 being deepest with lowest groundwater level. Not all plotted bores are placed in the same aquifer; however the overall regional trend can be observed. The groundwater flow is likely from the limestone area (MW08) in the south towards the Bungonia Creek.

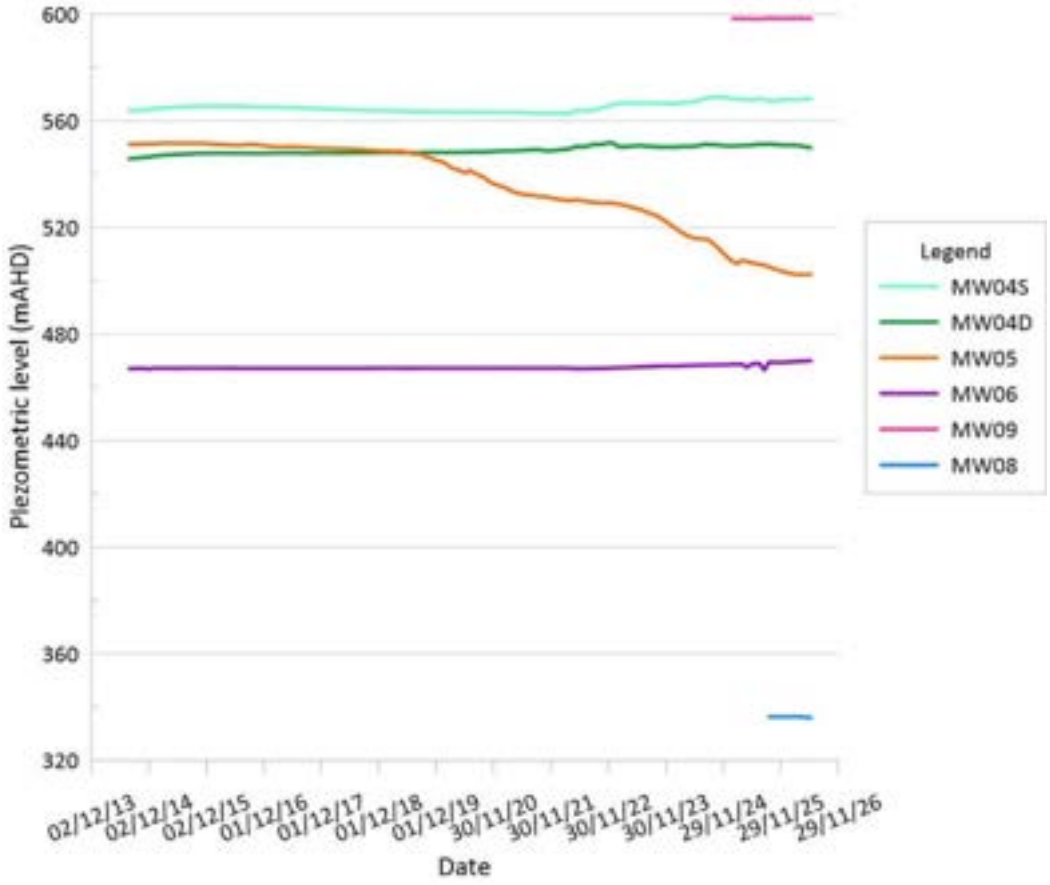



**Figure 7 Historical hydrographs for monitoring bores**

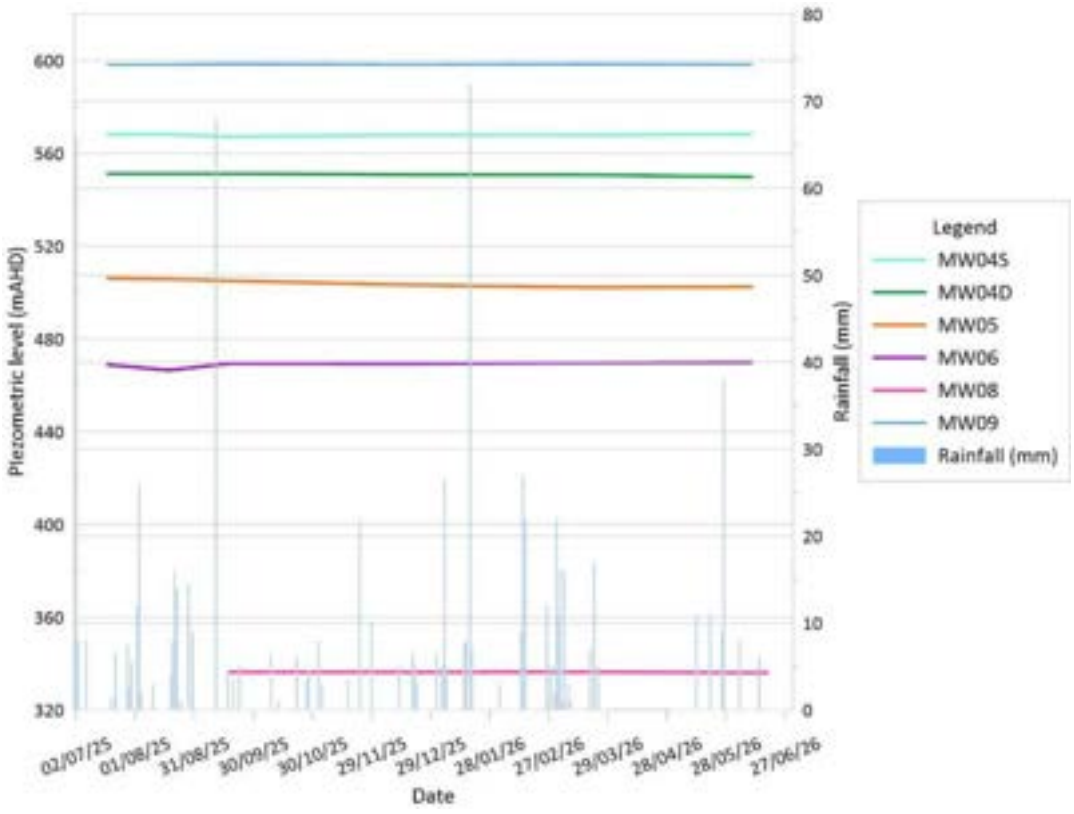



**Figure 8 Hydrographs for monitoring bores for 2025/2026 monitoring period**




**Figure 9 Map with piezometric levels (June 2026) , interpreted contours (blue dotted) and flow direction (blue arrows)**

## 3.2 Peppertree Quarry groundwater

Peppertree Quarry, operated by Boral, is located just north of the MSLM and there is a monitoring network of bores that monitor groundwater for the operation.

WMP requires that Peppertree Quarry bores are reviewed along with the MSLM bores to understand any changes and impacts from the operation. The assessment does not include comparison to trigger levels for this operation.

A network originally included 14 monitoring points out of which 12 are groundwater bores and two are pits which collect water. During 2025/2026 there were 8 bores which were monitored.

**Table 6** provides the summary of currently monitored bores at Peppertree Quarry and **Figure 7** and **Figure 13** show the locations. IEC samples water quality quarterly in all monitoring bores along with the manual water level reading. All bores are manually gauged except bore PSQ5D which has data logger installed to provide continuous monitoring of levels.

**Table 6 Summary of Peppertree Quarry monitoring bores and water levels (2025/2026)**

| *Monitoring bore* | *Total monitoring bore depth (mbgl)* | *Minimum** | *Maximum** | *Average* | *Continuous Datalogger Monitoring* |
|---|---|---|---|---|---|
| ***PQ01D*** | *39.3* | *581.4* | *581.7* | *581.* | *No* |
| ***PSQ3D*** | | *575.5* | *585.1* | *581.7* | *No* |
| ***PQ04S*** | *64.1* | *590.6* | *590.8* | *590.7* | *No* |
| ***PQ05D*** | *76.6* | *593.9* | *594.4* | *594.2* | *Yes* |
| ***PQ07D*** | *38.4* | *568.9* | *569.0* | *568.9* | *No* |
| ***PQ08D*** | *87.4* | *569.6* | *571.2* | *570.4* | *No* |
| ***PQ09D*** | *75.2* | *577.8* | *580.1* | *578.6* | *No* |
| ***PQS9S*** | | *575.4* | *575.7* | *575.6* | *No* |

*manual reading

**Figure 11** hydrographs show that all bores respond to long term weather events, with decrease in piezometric level until 2020, which marked the longer dry period. After 2020 an overall wetter weather period resulted in a piezometric level rise in all bores. Bores PQ01D, PQ04S, PQ5D and PQ07 have shown mainly stable trend throughout the monitoring period, indicating confined conditions and recharge likely occuring at some distance and via fracture network resulting in slow movement. Stronger response to recharge is observed in PQ03D, PQ8D and PQ09D with about 1-2 m rise and fall in response to rainfall. It is possible that these bores are installed in a highly fractured zone with good connectivity with surface. Paired bore PQ09S and PQ09D indicated there is an upward hydraulic gradient between the bores. The shallow bore shows stable trend while the deep one appears to respond to rainfall.

Hydrograph for PQ05 (**Figure 12**) shows that fluctuations in response to rainfall are observed with about 1 m rise followed by a natural decline in head after drier period.

In summary, groundwater levels in Peppertree quarry continue to respond to weather events, for some bores where fracture network enables groundwater flow. Groundwater levels are within the historically measured data and groundwater flow direction is towards the pit , which is in agreement with historical data.

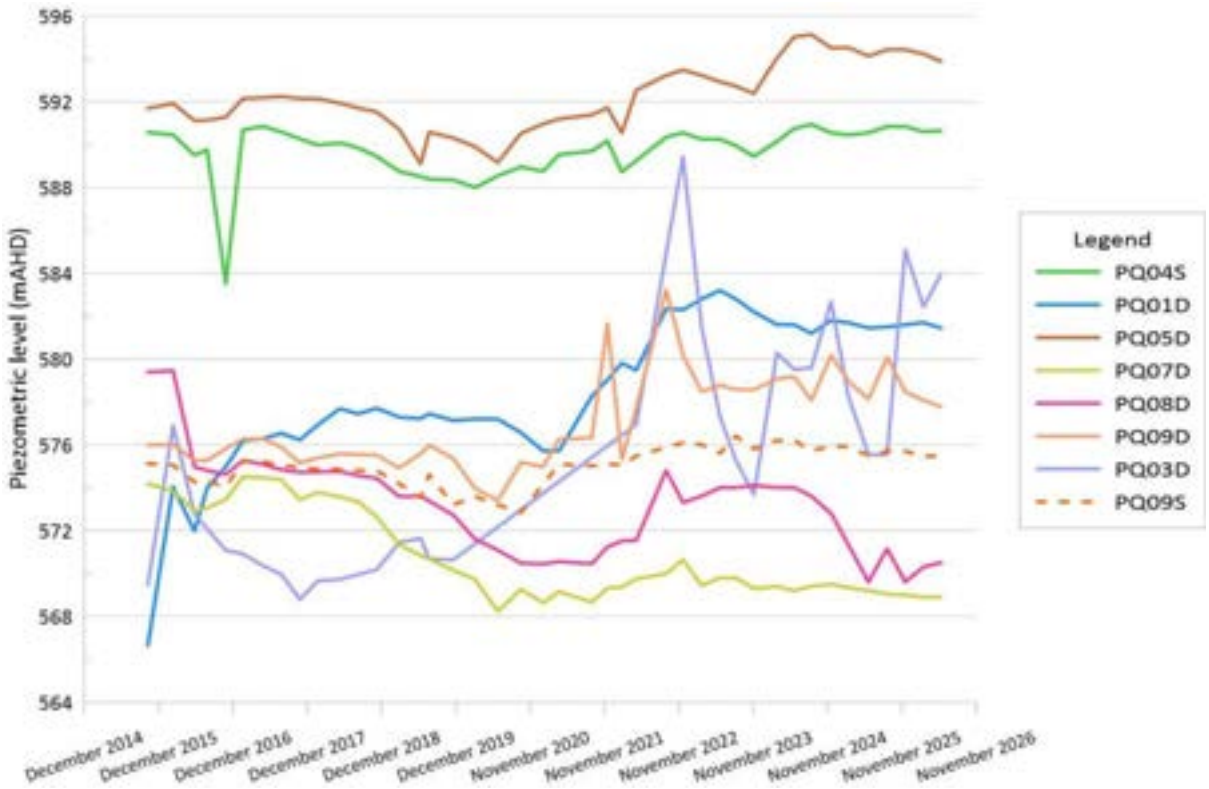



**Figure 10 Hydrographs for Peppertree Quarry bores since the start of monitoring**

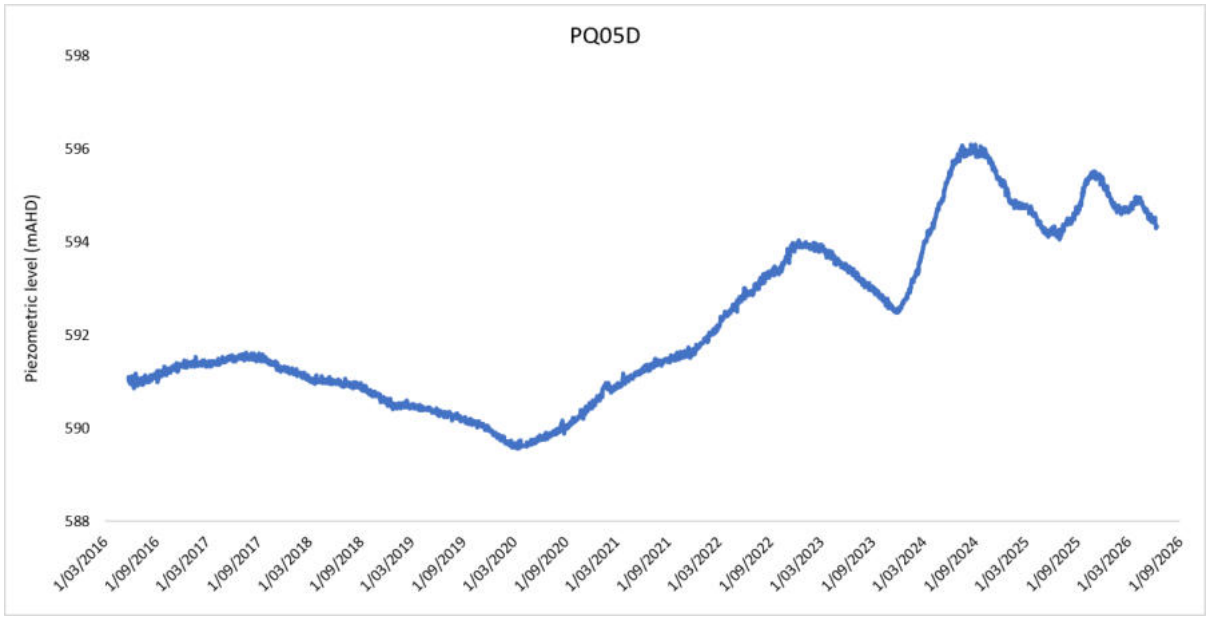



**Figure 11 Hydrograph for PQ05 bore- continuous monitoring**




**Figure 12 Piezometric levels (in yellow mAHD) and interpreted groundwater contours (dotted blue) and flow direction (blue arrows) for Peppertree monitoring bores**

# 4. GROUNDWATER QUALITY

## 4.1 Monitoring and analysis

Groundwater quality monitoring is undertaken at MSLM every 6 months (in March and September) for all bores except for MW05 where sampling is undertaken quarterly in accordance with the GWMP (AGE,2021). The sampling and data collation is undertaken by IEC in accordance with the Standard Operating Procedures (SOPs) included in Appendix E of the groundwater management plan (GWMP) (AGE, 2021).

## 4.2 Analytes monitored and trigger values

Groundwater quality monitoring program included the following:

- Field measurement/observations of parameters, including pH, electrical conductivity, temperature, redox potential, colour, odour and sediment load are recorded.
- The water quality analytical suite (analysed by a NATA accredited laboratory):
    - pH, electrical conductivity and total dissolved solids (calc.);
    - sodium adsorption ratio (SAR);
    - total hardness;
    - ions: anions - fluoride, bromide, sulphate, chloride; alkalinity - hydroxide, carbonate, bicarbonate and total alkalinity; cations – calcium, magnesium, sodium, potassium;

- total and dissolved metals - aluminium, arsenic, beryllium, barium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, strontium, vanadium, zinc, boron, iron and dissolved and total recoverable mercury.
- dissolved silica; and
- suspended solids and oil and grease .

Trigger levels in the GWMP are set for:

- EC and pH – exceedance of 5$^{th}$ and 95$^{th}$ % for pH and 95$^{th}$ % for EC of baseline data: and
- dissolved metals – criteria is the exceedance of ANZG (2018) previously ANZECC (2000) guidelines for beneficial use (stock and irrigation)

The results presented in **Section 4.3** provide the comparison of the monitoring results against the trigger levels set in GWMP (AGC, 2021).

## 4.3 Groundwater quality results 2025/2026

Field and laboratory results were collated and tabulated in a single database, and the following identified:

- key parameters including pH and EC concentrations that are either greater than the 95th percentile of baseline data or less than the 5th percentile of baseline data.
- ionic balance results which exceed the >± 10% margin
- dissolved metal concentrations that exceed ANZECCC guidelines for beneficial use (stock and/or irrigation water as per GWMP). The ANZECC & ARMCANZ 2000 water quality guidelines (referenced in ANZG 2018) are not directly applicable for groundwater where water extraction for beneficial purposes is not occurring, or the groundwater is not supporting a groundwater dependent ecosystem.

Time series plots have been generated for water quality indicators with trigger values based on the 5$^{th}$ and 95$^{th}$ percentile of baseline data for pH and EC and compared with short- and long-term water level trends (**Appendix A**).

All laboratory analytes (metals) have been tabulated and compared against ANZG (2018) (previously ANZECC 2000) guideline values for stock and/or irrigation water (**Table 9**).

Piper diagram has been generated as a visualisation tool to understand the relative major ion abundance and water chemistry at each monitoring site and different geology types. Piper diagrams are useful in identifying differing or mixing, chemistry signatures between hydrostratigraphic units and how signatures change over time. **Figure 14** shows the Piper diagram generated from 2025/2026 data.

### 4.3.1 Field Parameters

The summary of the results for water quality parameters (EC, pH) indicates (**Table 7**):

- pH varied in all bores but it was mainly around neutral, within the historical range with the exception of MW04s where pH was slightly lower at 7.27 below the 5$^{th}$% in March 2026. In all other events and bores, pH ranged within the trigger level; and

- Groundwater is slightly brackish ranging from 550 to 3040 µS/cm, and typically exceeds the salinity measured last year. Salinity was lowest in MW4D (downgradient) and highest in MW05 and MW04S (downgradient and shallow). MW04S and MW05 had EC above trigger level during majority of monitoring events. The EC had been above defined trigger in bore MW04s for over 3 years, which would result in trigger level event. As per TARP in the GWMP, Boral undertook an investigation into the elevated EC at this bore in 2024/2025 and a memo was prepared in November 2024. Given that there was no change in the operation over this time, and this bore is outside of the predicted mining influence, it is likely that this represents natural fluctuation in EC. This is also supported by the fact that there had been no trend in EC over time. However, updated trigger levels based on the historical data will address this exceedance. Salinity measured in two new bores MW8 and MW9 varied significantly over the monitoring events with an increase in MW08 and decrease in MW09 over two monitoring events. There are no trigger levels set for these bores as there is insufficient data, however, ongoing monitoring will provide more insight in the chemistry of those two bores.

**Table 7 Summary of pH and EC results for groundwater bores at MSLM**

| **Monitoring bore** | | **pH** | | | **EC** | |
|---|---|---|---|---|---|---|
| | | Observed | 5th % | 95th% | Observed | 95th% |
| **MW04s** | Sep-25 | 7.6 | 7.3 | 7.8 | 2880 | 1728 |
| | Mar-26 | 7.27 | | | 3040 | |
| **MW4d** | Sep-25 | 7.81 | 7.7 | 8.8 | 800 | 1384 |
| | Mar-26 | 8.15 | | | 592 | |
| **MW05** | Sep-25 | 7.91 | 6.5 | 11.5 | 1470 | 1386 |
| | Dec-25 | 7.55 | | | 1410 | |
| | Mar-26 | 7.56 | | | 1380 | |
| | Jun-26 | 7.45 | | | 1410 | |
| **MW06** | Sep-25 | 7.88 | 7.1 | 7.9 | 1950 | 2315 |
| | Mar-26 | 7.46 | | | 1820 | |
| **MW08** | Sep-25 | 7.95 | NA | NA | 550 | NA |
| | Mar-26 | 7.52 | | | 1840 | |
| **MW09** | Sep-25 | 7.75 | NA | NA | 1950 | NA |
| | Mar-26 | 7.77 | | | 563 | |

**Appendix A** presents the pH and EC results for each of the bores providing historical data and comparison with results from current reporting period.

### 4.3.2 Ionic balance results

GWMP requires that analytical results for groundwater samples have ionic balance results which do not exceed the >± 10% margin. Laboratory results indicate that there were no exceedances of ionic balance over 10 % margin as shown in **Table 8.**

**Table 8 Summary of ionic balance for groundwater samples collected over the 2025/2026**

| Monitoring bore | Sample date | Ionic balance |
|---|---|---|
| **MW04s** | Sep-25 | 2.86 |
| | Mar-26 | 1.41 |
| **MW4d** | Sep-25 | 2.75 |
| | Mar-26 | 1.11 |
| **MW05** | Sep-25 | 4.7 |
| | Dec-25 | 0.23 |
| | Mar-26 | 1.02 |
| | Jun-26 | 7.23 |
| **MW06** | Sep-25 | 1.77 |
| | Mar-26 | 2.34 |
| **MW08** | Sep-25 | 2.58 |
| | Mar-26 | 4.28 |
| **MW09** | Sep-25 | 3.87 |
| | Mar-26 | 3.47 |

### 4.3.3 Dissolved metal concentration

GWMP requires that dissolved metal concentrations that exceed ANZECCC guidelines for beneficial use (stock and/or irrigation water as per GWMP) be reported as exceedance. The ANZECC & ARMCANZ 2000 water quality guidelines (referenced in ANZG 2018) are not directly applicable for groundwater where water extraction for beneficial purposes is not occurring, or the groundwater is not supporting a groundwater dependent ecosystem.

**Table 9** provides tabulated summary of dissolved metals in groundwater and comparison with ANZG (2023) draft guidelines for irrigation and livestock drinking water guidelines, as these guidelines have superseded ANZG 2018 guidelines for this category.

**Table 9 Summary of hydrogeochemical composition of groundwaters compared to ANZG (2018) guidelines**

| Analytes | ANZG (2023ab) | | **MW04s** | | **MW4d** | | **MW05** | | | | ***MW06*** | | ***MW08*** | | ***MW09*** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **(mg/L)** | **Irrigation guidelines SGV** | **Livestock drinking guidelines** | **Sep-25** | Mar-26 | **Sep-25** | Mar-26 | **Sep-25** | Dec-25 | Mar-26 | Jun-26 | **Sep-25** | Mar-26 | **Sep-25** | Mar-26 | **Sep-25** | Mar-26 |
| Aluminium | 20 | 5 | <0.01 | <0.01 | 0.18 | 0.06 | 1.76 | 0.96 | 0.73 | 3.78 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Arsenic | 2 | 0.025 | <0.001 | <0.001 | 0.004 | <0.001 | 0.015 | 0.013 | 0.014 | 0.027 | 0.069 | 0.041 | 0.002 | 0.023 | 0.02 | 0.002 |
| Beryllium | 0.5 | 0.06 | <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 |
| Barium | NA | NA | 0.069 | 0.073 | 0.062 | 0.1 | 0.057 | 0.054 | 0.047 | 0.065 | 0.026 | 0.027 | 0.033 | 0.059 | 0.057 | 0.032 |
| Cadmium | 0.05 | 0.01 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | 0.0003 | 0.0002 | 0.0002 | 0.0005 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 | <0.0001 |
| Chromium | 1 | 0.05 | <0.001 | <0.001 | <0.001 | 0.001 | 0.006 | 0.011 | 0.002 | 0.004 | <0.001 | <0.001 | 0.02 | <0.001 | <0.001 | 0.003 |
| Cobalt | 0.1 | 1 | <0.001 | <0.001 | <0.001 | <0.001 | 0.004 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 | <0.001 | <0.001 | 0.001 | <0.001 |
| Copper | 5 | 0.5 | <0.001 | <0.001 | 0.003 | <0.001 | 0.003 | 0.003 | 0.002 | 0.011 | <0.001 | 0.002 | 0.004 | <0.001 | <0.001 | 0.002 |
| Lead | 2 | 0.1 | <0.001 | <0.001 | <0.001 | <0.001 | 0.006 | 0.004 | 0.004 | 0.009 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Manganese | 10 | 10 | 0.335 | 0.322 | 0.127 | 0.014 | 0.317 | 0.195 | 0.202 | 0.27 | 0.014 | 0.014 | 0.012 | 0.116 | 0.111 | 0.022 |
| Molybdenum | 0.05 | 0.01 | <0.001 | <0.001 | <0.001 | 0.003 | 0.002 | 0.003 | <0.001 | <0.001 | <0.001 | 0.001 | 0.002 | 0.033 | 0.018 | 0.006 |
| Nickel | 2 | 1 | <0.001 | <0.001 | <0.001 | 0.004 | 0.005 | 0.007 | 0.005 | 0.01 | 0.006 | 0.007 | <0.001 | <0.001 | <0.001 | 0.001 |
| Selenium | 0.05 | 0.02 | <0.01 | <0.010 | <0.01 | <0.010 | <0.01 | <0.010 | <0.010 | <0.010 | <0.01 | <0.010 | <0.01 | <0.010 | <0.01 | <0.010 |
| Strontium | NA | NA | 1.13 | 1.18 | 1.26 | 0.92 | 0.328 | 0.347 | 0.321 | 0.407 | 0.497 | 0.505 | 0.12 | 0.365 | 0.348 | 0.161 |
| Vanadium | 0.5 | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Zinc | 5 | 20 | 0.006 | 0.014 | 0.006 | 0.007 | 0.021 | 0.024 | 0.017 | 0.054 | <0.005 | 0.01 | <0.005 | <0.005 | <0.005 | 0.006 |
| Boron | 0.75-15 | 5 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Iron | 10 | NA | 4.1 | 3.85 | 1.85 | 0.14 | 1.57 | 0.83 | 0.75 | 3.68 | 0.93 | 0.3 | 0.27 | 4.68 | 4.77 | 0.21 |

Note: Greyed results exceed ANZECC (2000) Guideline

- SGV specific guideline value 20 year irrigation

ID insufficient data for guideline development

Results indicate that overall concentration of metals is low, with the exception of arsenic in MW06, and molybdenum in MW08 and MW09, which exceeded livestock drinking water guideline only. However, review of historical levels of arsenic in MW06 indicates that historically since 2014 the level of arsenic remained constant and above the ANZG (2023) guideline. This indicates that arsenic concentration while above the guidelines is not considered to be exceeding the guidelines as it is within the historical baseline values. Exceedance of molybdenum in MW09 and MW08 above the livestock drinking water guidelines (ANZG, 2023), is likely to be the baseline for this bore, and needs to be revisited once 2 years of data isavailable.

**Appendix B** presents dissolved metal results for each of the bores providing historical data and comparison with results from current reporting period. Dissolved metals presented in graphs are selected on the basis of concentration and importance to the environment.

### 4.3.4 Groundwater chemistry

The major ions for groundwater results are plotted on a Piper diagram (**Figure 14**). A Piper diagram is a trilinear diagram, which has the major ions (cations-sodium, potassium, calcium and magnesium and anions-chloride, sulphate and bicarbonate) expressed in miliequivalents per litre. The diagram is used to classify the water based on major ion results.

In order to allow the water classification, the samples were separated into groups representing different geology/lithology: Adaminaby group sandstone, Carne Dacite Tuff, and Tangrang dacite or tuff and limestone.

The results indicate the following:

- Groundwater within tuff formation is calcium chloride type and limestone is magnesium-carbonate type water probably more dolomite than limestone,
- Adaminaby sandstone and Carne Dacite do not fall into any of the water sub-types and represents mixed waters with a range of cation and anion concentration.
- Geochemical fingerprint of dacite is likely due to variability in depth.

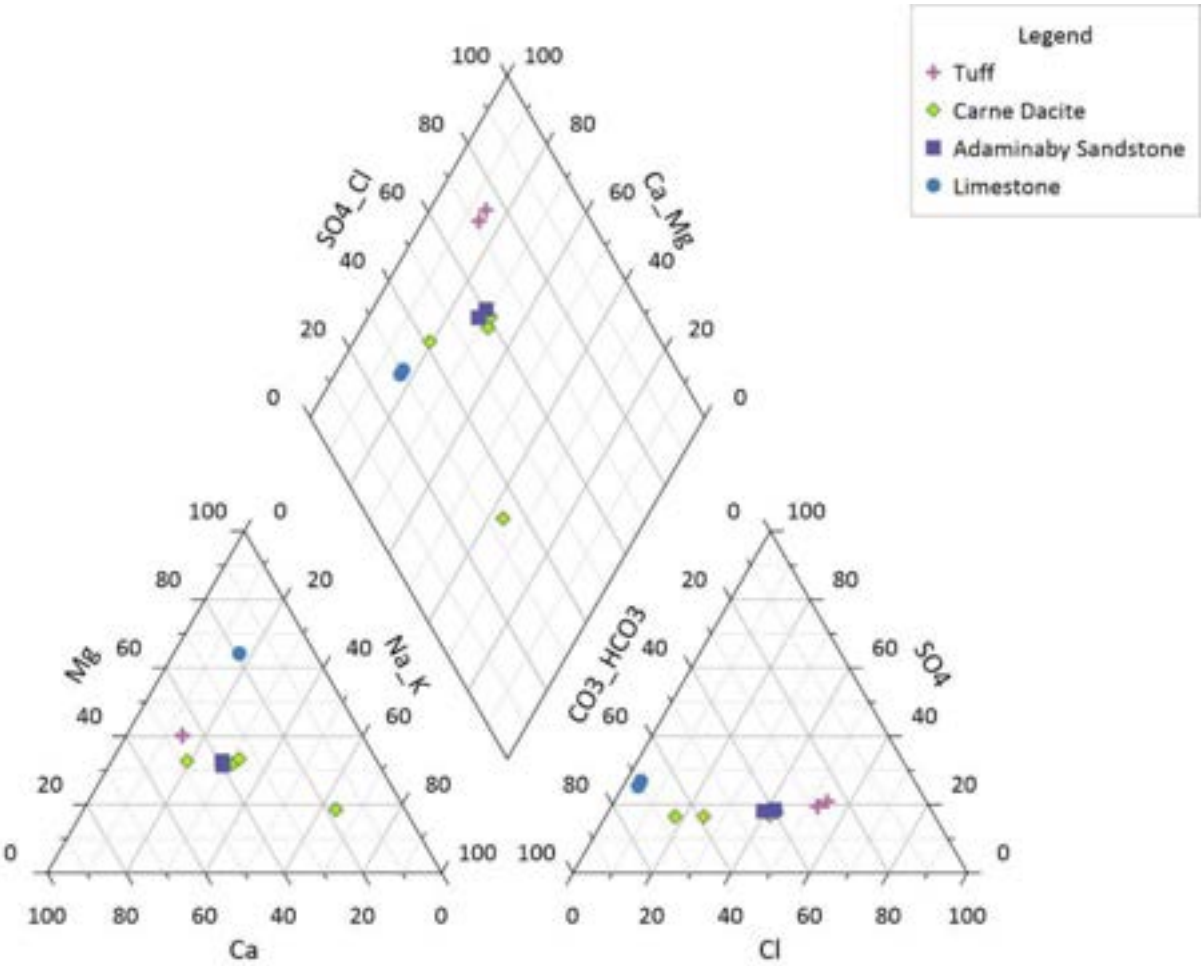



**Figure 13 Piper diagram showing distinct groundwater types 2024/2025**

# 5 PRODUCTION BORES COMPLETED SECTION

Two production bores were installed in 2021 and were used to supplement mine water supply. The combined abstraction volume was estimated at installation to be in the order of 6 litres per second (L/s) or ~189 mega litres per year (ML/year). Groundwater abstraction from production bores is measured through installed flow meters. The annual production rates are calculated from the flow meter readings and reported in this groundwater report. Bore WB07 South Dave Shepard is now dry.

**Table 10** shows the flowmeter reading at the start and end of the year. Total used for the year 18.5 ML, which is within the approved WAL. Boral Pty Ltd is in the process of linking the water supply works to WAL41976.

**Table 10 Production bore summary**

| Groundwater extraction | Flowmeter reading ($m^3$) July 2024 | Flowmeter reading ($m^3$) July 2025 | Used ($m^3$) |
|---|---|---|---|
| **WB7 North Dave Shep** | 40284 | 58128 | 17,844 |
| **WB07 South Dave Shep** | 11439 | 12104 | 665 |

There is no other groundwater abstraction incidental or non-incidental on the Mine.

# 6 GROUNDWATER SEEPAGE

Spring flow and groundwater seepage is being monitored through the surface water monitoring plan. Data gathered through the surface water monitoring program has been reported by comparing it with the annual groundwater data in the annual groundwater review. Hydrographs have also been compared between monitoring locations to reveal more significant changes in water level from climatic conditions and are linked with spring flow observations as reported in **Section 3.2.**

The surface water management plan provides trigger parameters for observed spring flow and is reported in annual report. Groundwater seepage is monitored via spring flow at "Blow hole" and any significant changes reported here.




**Figure 14 Time series – Groundwater seepage and GDEs as observed in Blowhole basic water quality parameters**

**Figure 15** shows the fluctuation in basic water quality parameters during current reporting period and provide comparison with historical data. It can be observed that there were no changes in pH and EC over the reporting period compared to historical data, with a decrease in EC and slight decrease in pH noted. Therefore, the impact of mining on groundwater seepage and GDEs is considered to be negligible.

EIS (Element Environment, 2019) indicated that baseflow from bedrock into Bungonia Creek was likely to only reduce by 1% due to the Project and it is unlikely to have a detrimental impact on creek flow. Therefore, they predicted that impacts on the water quality of the creeks caused by incidental water take were likely to be minimal. Reporting on alluvial aquifers is addressed by observing changes in Bungonia Creek water quality (**Figure 16**). Basic water quality parameters during this reporting period remain within historical range. Therefore, no impact from mining on baseflow is observed.

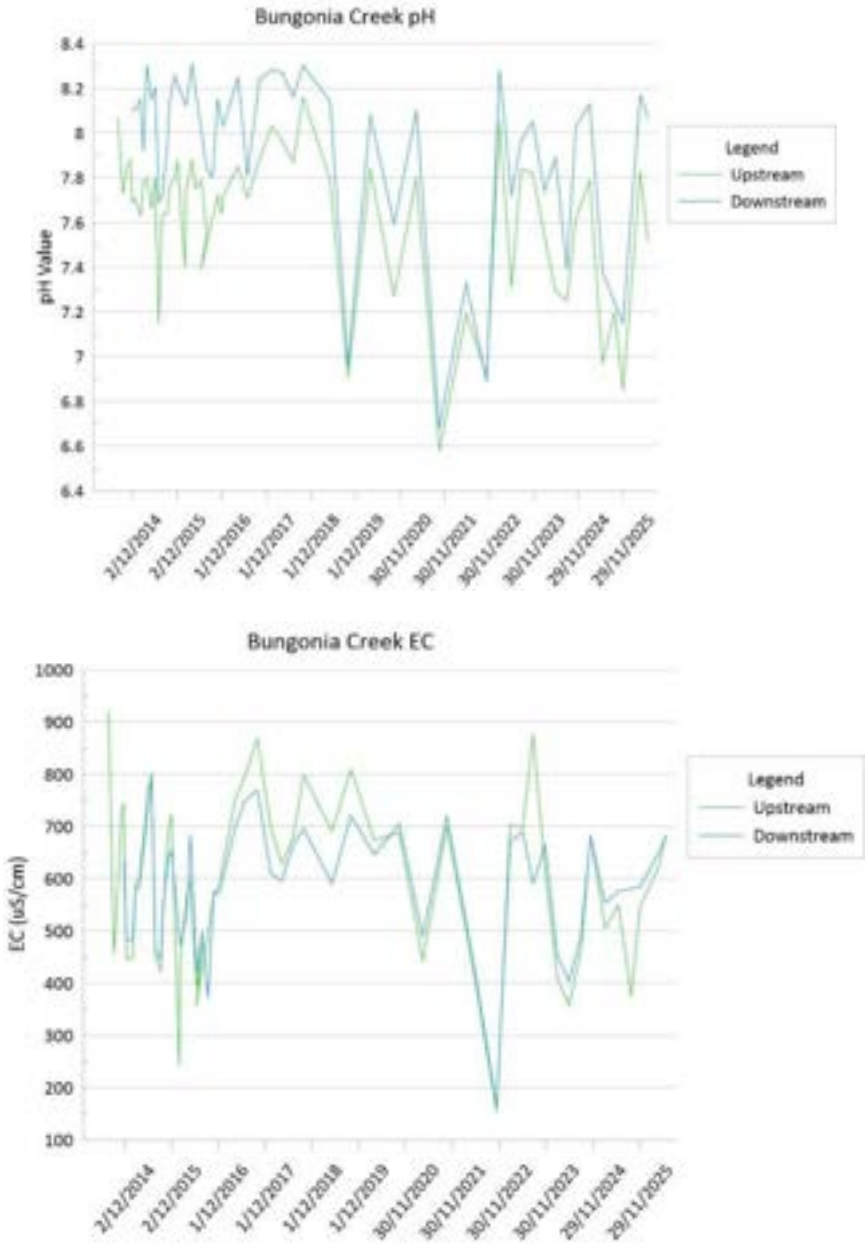



**Figure 15 Time series – Baseflow observed in Bungonia Creek basic water quality parameters**

Historically Bungonia downstream monitoring point had higher pH comparted to upstream, and the EC between the upstream and downstream points varied. During some periods the downstream point had higher salinity which is not expected except if baseflow is discharging between two points. Over the past 3 years the downstream point had higher salinity as expected along the flow.

# 7 CONCLUSIONS AND RECOMMENDATIONS

The review of groundwater levels and water quality was undertaken as an annual update related to the operation of the MSLM for the period from July 2025 to June 2026. The report discusses potential impact from operation on the groundwater system, nearby private bores, and ecosystems during this period. The following are the findings of the study:

- Groundwater levels responded to wetter and drier climate events within historically observed fluctuation. Groundwater level in MW06 bore decreased below 5$^{th}$ % during December 2025 but has recovered since, therefore no trigger event occurred.

- Highest groundwater level is recorded in the west of the Mine, (MW04S and MW9) and lowest in the east (MW08 and MW06). This trend is as observed at the start of mining and is consistent with conceptual groundwater model. There is limited influence from extraction activities on groundwater.

- In MW05 bore which recorded depressurisation over the past 8 years piezometric level decrease appears to have slowed down and was 4 m during this monitoring period.

- Groundwater levels in Peppertree quarry are very similar to those measured in the previous monitoring period and continue to respond to long term weather events. Groundwater levels are within the historically measured data and groundwater flow direction is towards the pit, which agrees with historical data

- MSLM does not have all bores installed in the same hydrostratigraphic unit, and same depth, however, the interpreted equipotential lines provide the regional groundwater flow direction. Interpreted groundwater flow is towards the east and southeast and unchanged from that reported in the GWMP (AGE, 2021). Peppertree Quarry groundwater flow has been interpreted towards the currently mined pit which is agreement with previously reported.

- pH varied in all bores around neutral and within the historical range. The pH was only slightly below the 5th% in March 2026 for MW04S. In all other events and bores pH ranged within the trigger level;

- Groundwater is fresh to slightly brackish ranging from 550 to 3040 µS/cm. Overall recorded EC levels were slightly above last year but within the historical range. The EC had been above defined trigger in MW04S over the last 3 years, and MW05 over the last year which would result in trigger level event. As per TARP, Boral undertook an investigation into the elevated EC and a memo was prepared in November 2024. The investigation recommended that bore development be undertaken, suggested a change of sampling method, and an update of the TARP to reflect natural change in water quality with data from 2020 onwards to be included. Given that there was no change in the operation over this time, and the piezometric level in these bores is within the predicted, it is likely that this represents natural fluctuation in EC. This is also supported by the fact that there had been no trend in EC over time.

- There were no exceedances of ionic balance over 10 % margin as per GWMP (AGE, 2021)

- Analysis of dissolved metals in groundwater indicates that overall concentration of metals is low, with the exception of arsenic in MW05 and MW06, which exceeded livestock drinking water guideline (draft ANZG, 2023). However, review of historical levels of arsenic on the contact between limestone and shale in those bores indicates that historically the level of arsenic was slightly elevated. Recommended TARP (not formally approved) was updated for this parameter.

- Groundwater within tuff formation is calcium chloride type (compared to calcium sulphate type over the last monitoring period) and limestone is magnesium-carbonate type water probably more dolomite than limestone
- Adaminaby sandstone and Carne Dacite do not fall into any of the water sub-types and represents mixed waters with a range of cation and anion concentration.
- Spring flow and groundwater seepage monitored via Blowhole indicates that there had been no change in water chemistry over the past year. Similarly, baseflow chemistry monitored in Bungonia Creek indicates no change in water chemistry over the past period.

- Pumping from production bores was within the approved WAL held by Boral for the MSLM. Groundwater production was mainly from Northern bore and significantly reduced to 50% to that of last year.

- No impact from the Quarry operations has been observed on the groundwater system, surface expression of groundwater and private bores.

Potential impact of the MSLM has been reviewed in accordance with the GWMP (AGE, 2021):

- Water level changes due to water take, drawdown and aquifer interconnectivity:
    - Water supply bores – no more than 2 m drawdown was observed at monitoring bores MW3D, MW4D, MW6, MW8 and MW9
    - GDEs – no adverse observed impact compared to historical events
    - Regional Monitoring bores- as observed by monitoring network drawdown in excess of 2 m was observed in MW05 (4 m observed) resulting from production bore pumping but is confined to the vicinity of this bore. No regional or other Mine monitoring bores are impacted.
- Water quality changes due to mining, final void and emplacement:
    - Water supply bores- there has been no change in beneficial use category (domestic and drinking water), produced volume was reduced by over 50% compared to previous monitoring period.
    - GDEs and springs – there has been no change in ANZG (2018) aquatic ecosystem water quality as observed in monitoring bores, Blowhole and Bungonia Creek
    - Mine monitoring bores- no change in beneficial use category – irrigation and stock. Exceedance where reported is due to elevated baseline data.
    - Groundwater inflow into the pit- no pit inflow has been observed
    - Water loss/seepage from water storages into groundwater system – no change in water levels in monitoring bores MW06, MW07 and MW08.

The following is recommended:

- While TARP has been updated in 2024, it has not been formally approved, therefore the natural changes in water quality and groundwater level over time are not well represented.
- A list of receiving receptors has been addressed in TARP update in 2024 but not formally approved. It is expected that once approved the groundwater quality data will provide early warning by using either trend method or derivation of mine specific guidelines.

## 8. REFERENCES

Australian and New Zealand Guidelines for Fresh and Marine Water Quality ANZG 2018. Volume 1, The guidelines /Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand.

Australian Groundwater Consultants (2021) Groundwater management plan, prepared for Boral Marula South Mine.

ANZG (2023a). Water Quality for Irrigation and General Water Uses: Guidelines. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand governments and Australian state and territory governments, Canberra.

ANZG (2023b). Livestock drinking water guidelines. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra.

Bureau of Meteorology, 2025 Groundwater Dependent Ecosystems Atlas, accessed 20 June 2025 from http://www.bom.gov.au/water/groundwater/gde/index.shtml

NSW Office of Water and the OEH, 2012 Risk assessment guidelines for groundwater dependent ecosystem

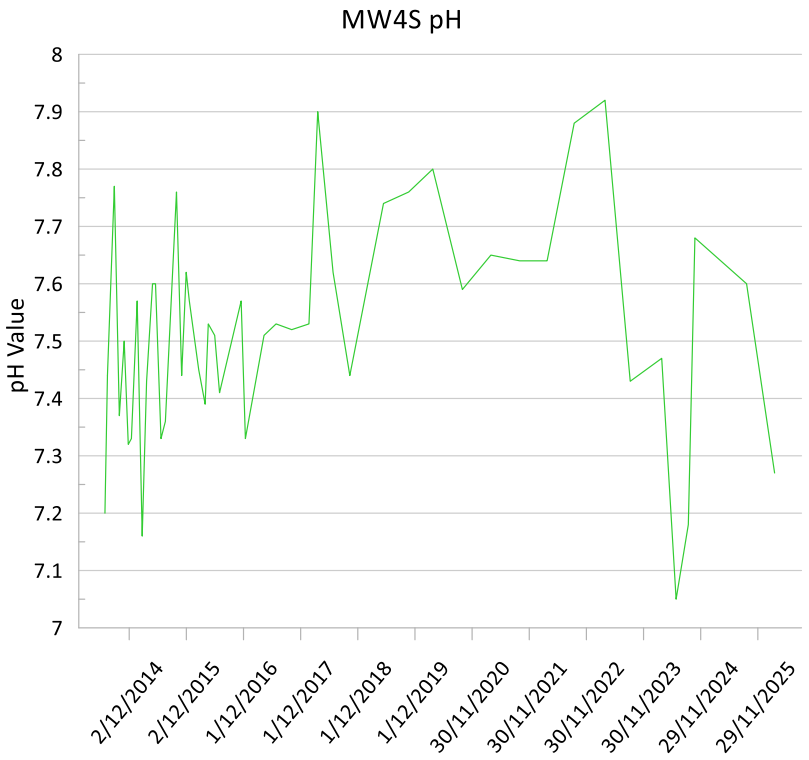
LIMITATIONS

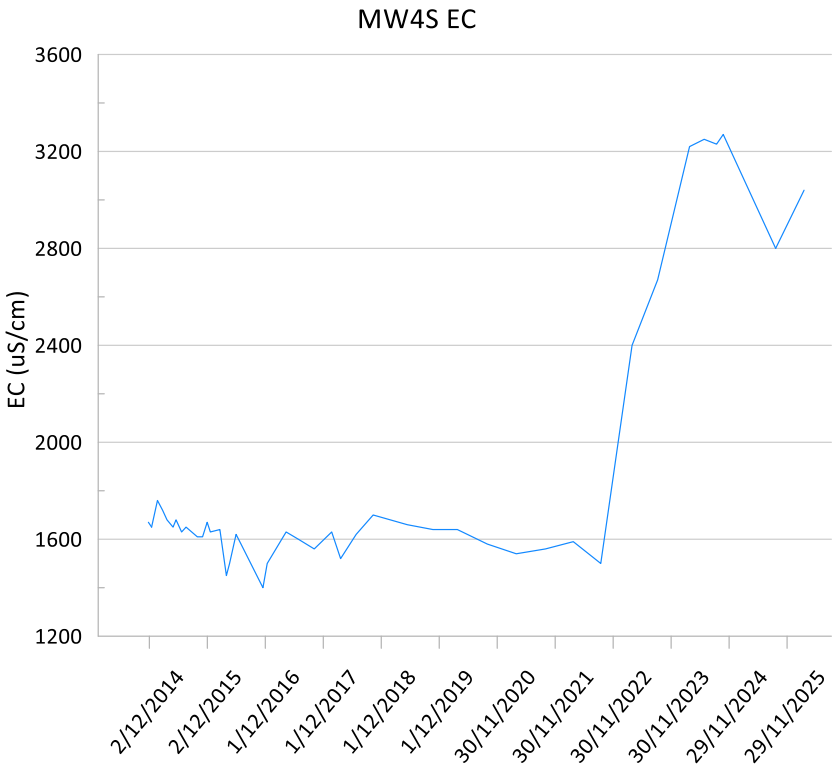
K.David has prepared this report for the use of Boral in accordance with the standard terms and conditions of the consulting profession. This report is prepared in accordance with the agreed scope of work. The methodology adopted and sources of information used are outlined in the report.

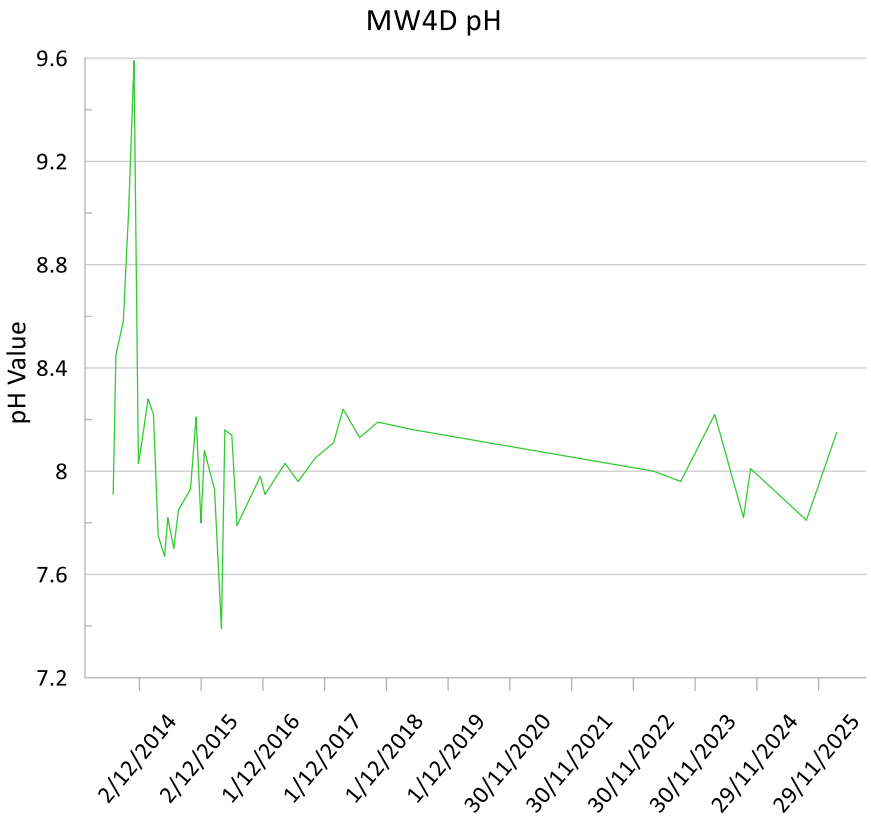
The report was prepared during July/August 2026 and is based on the information reviewed at the time of preparation. The report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose by third parties.

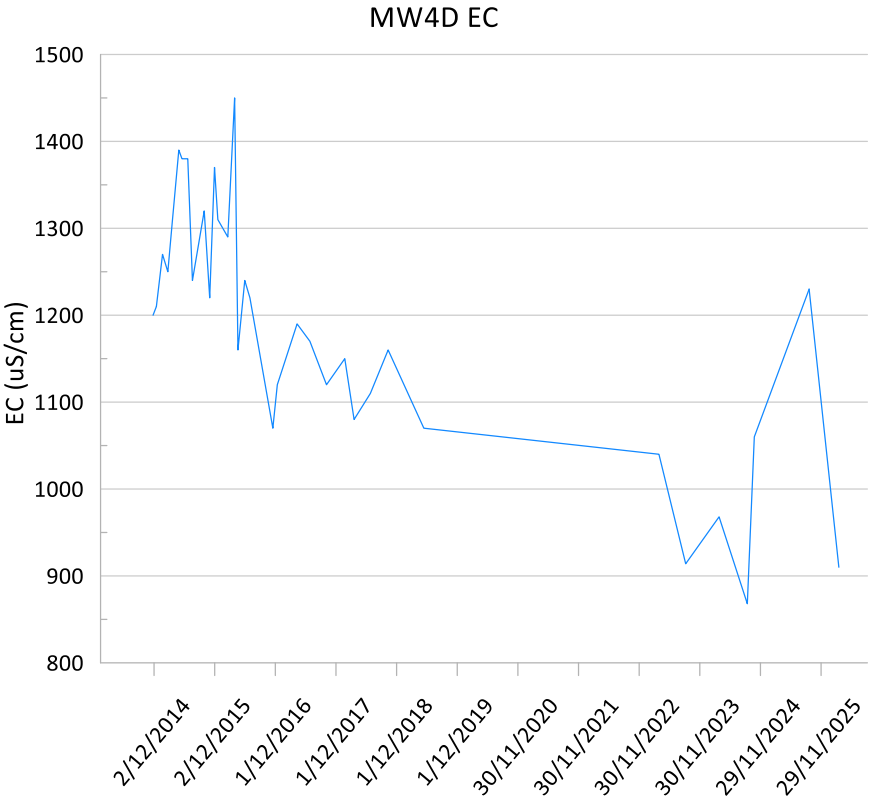
APPENDIX A

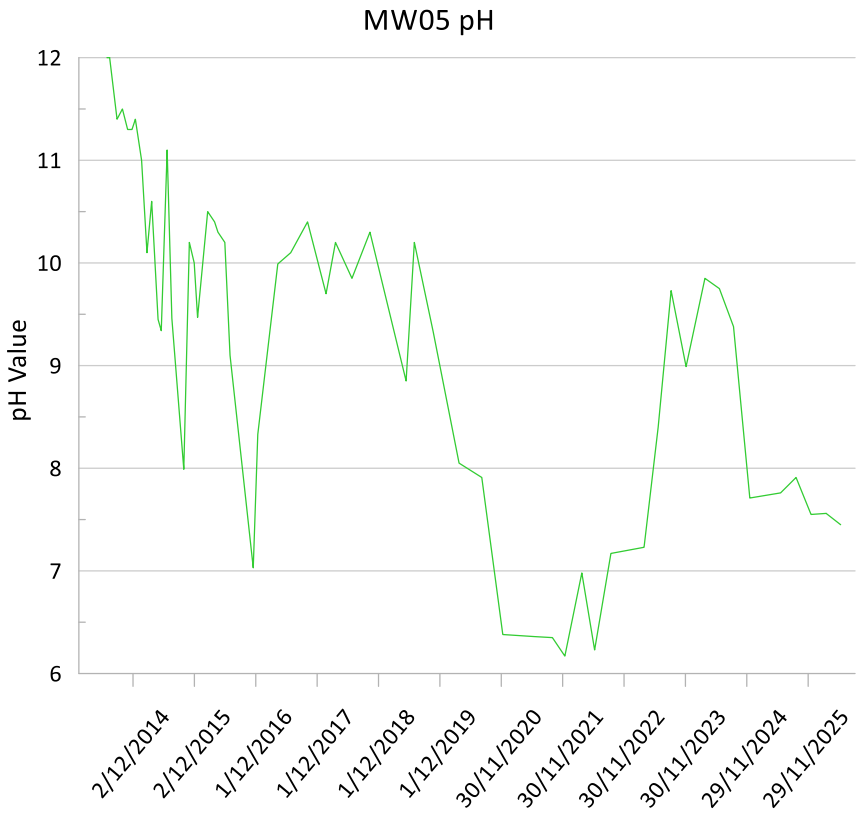
Time series groundwater data for pH and EC

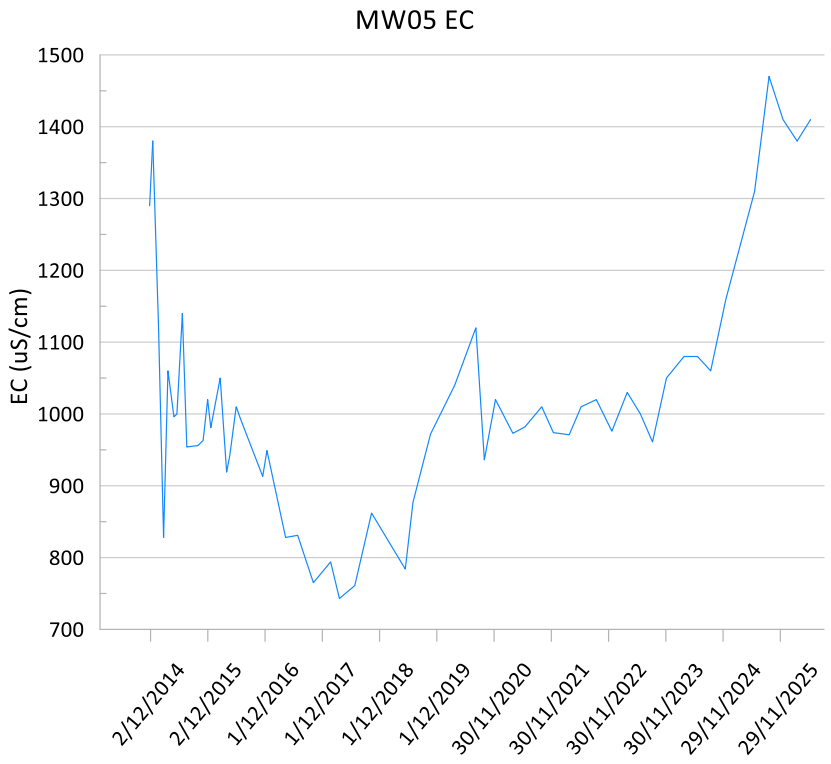

MW4S pH
pH Value
8
7.9
7.8
7.7
7.6
7.5
7.4
7.3
7.2
7.1
7
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

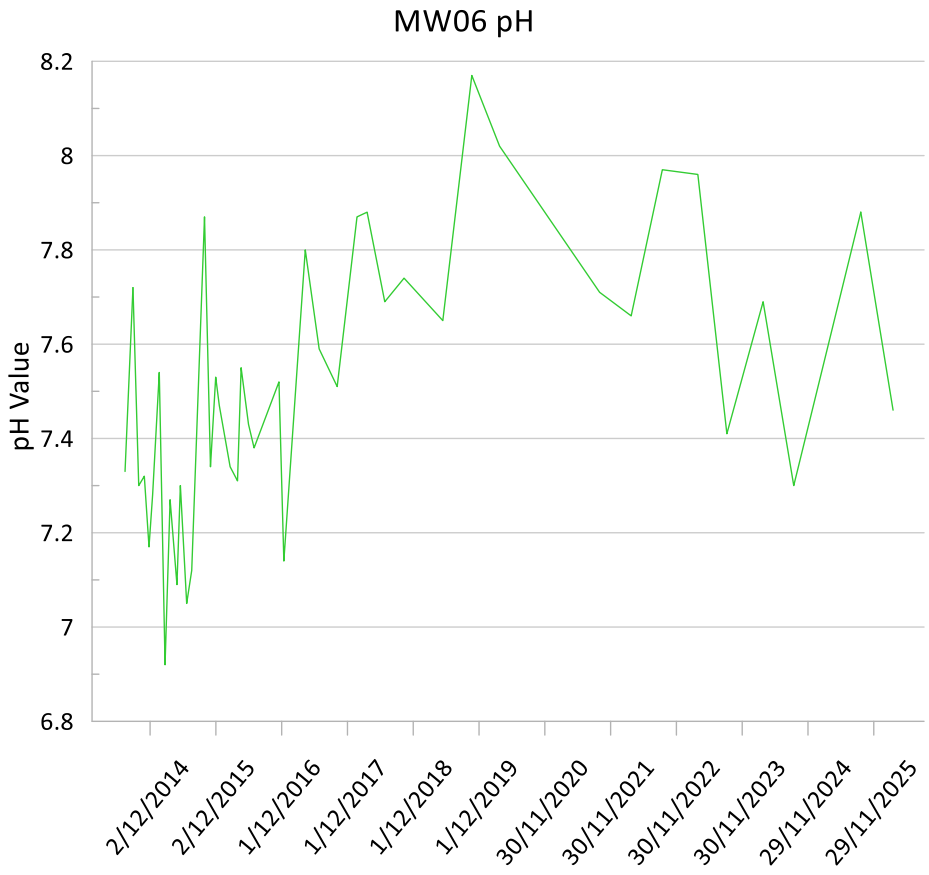

MW4S EC
EC (uS/cm)
3600
3200
2800
2400
2000
1600
1200
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
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30/11/2022
30/11/2023
29/11/2024
29/11/2025

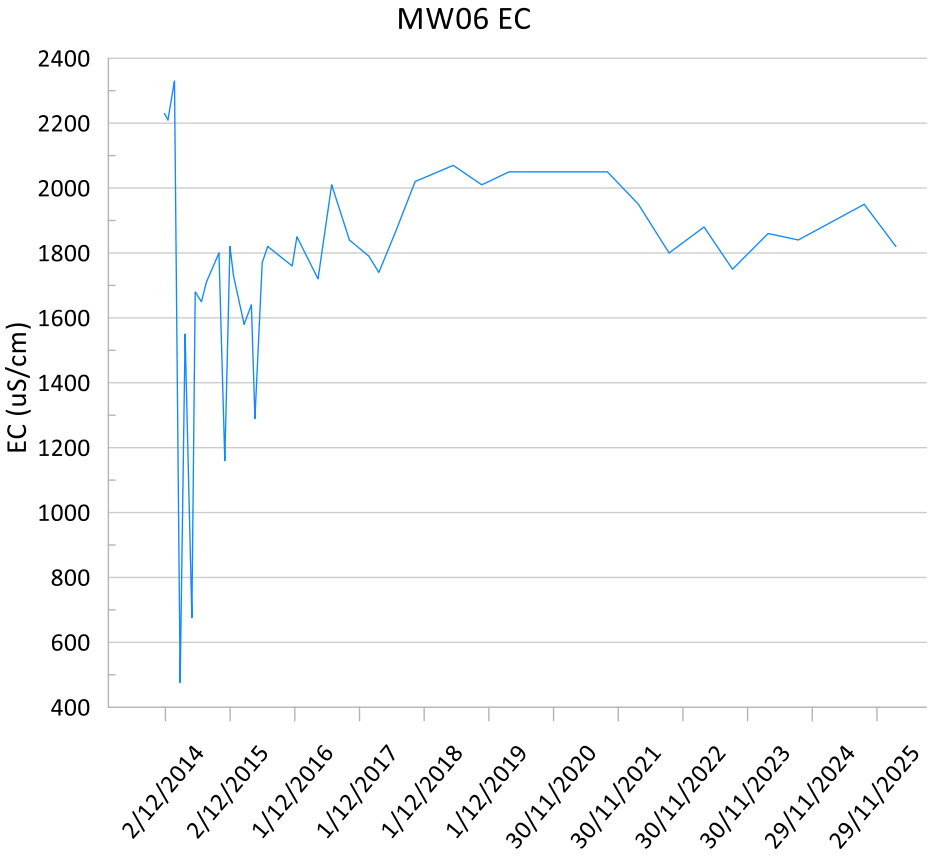

MW4D pH
pH Value
9.6
9.2
8.8
8.4
8
7.6
7.2
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
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29/11/2024
29/11/2025

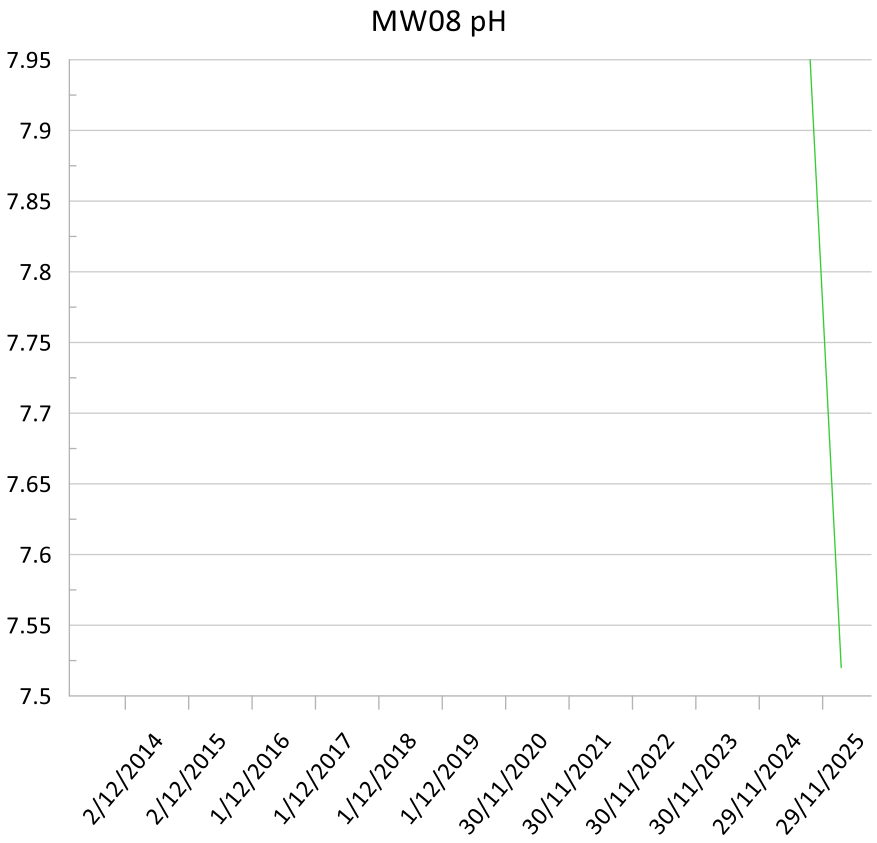

MW4D EC
EC (uS/cm)
1500
1400
1300
1200
1100
1000
900
800
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

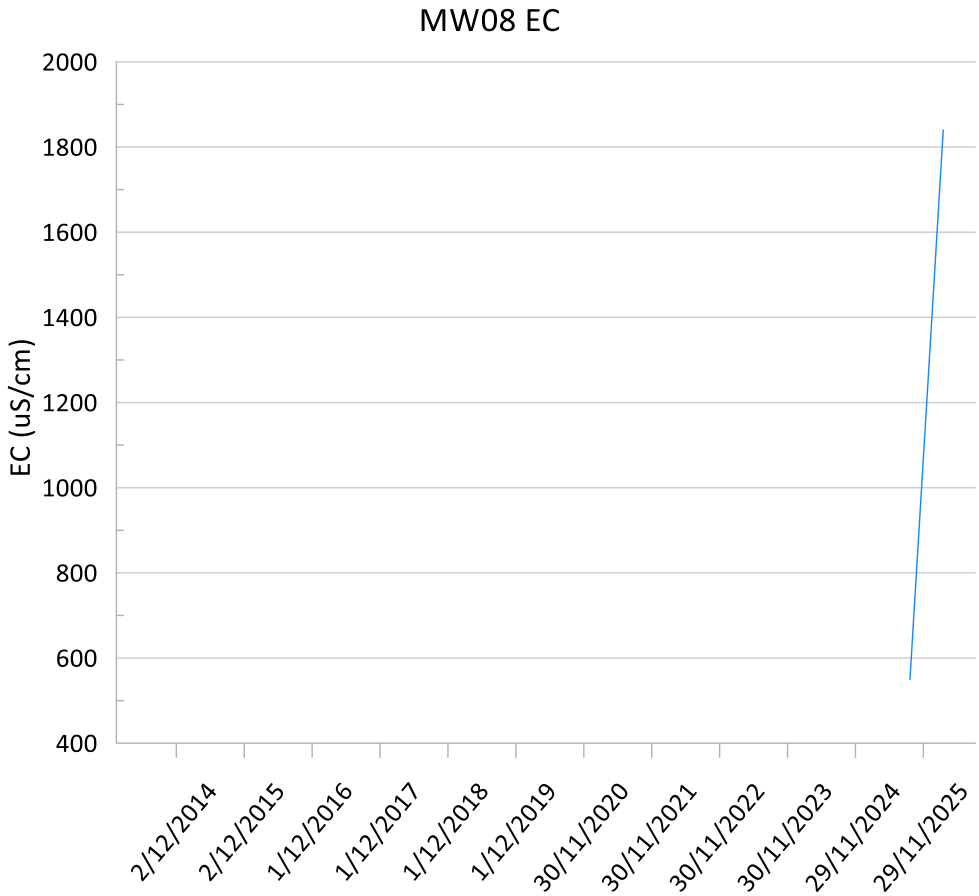

MW05 pH
pH Value
12
11
10
9
8
7
6
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

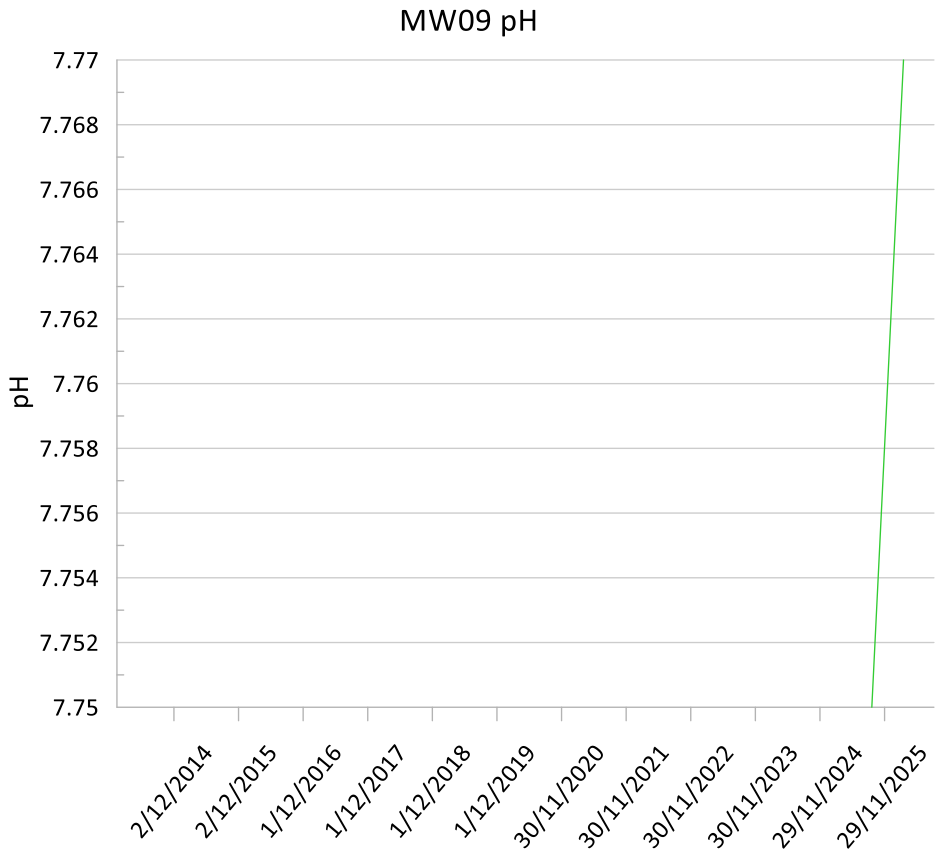

MW05 EC
EC (uS/cm)
1500
1400
1300
1200
1100
1000
900
800
700
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
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29/11/2024
29/11/2025

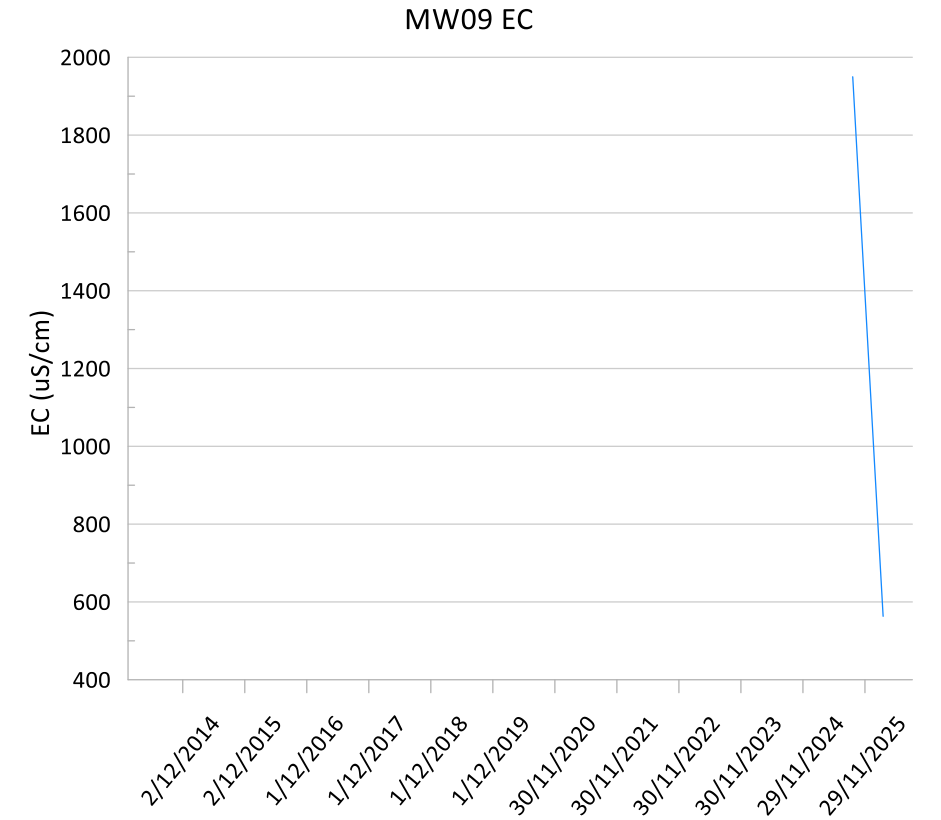

MW06 pH
pH Value
8.2
8
7.8
7.6
7.4
7.2
7
6.8
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW06 EC
EC (uS/cm)
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW08 pH
7.95
7.9
7.85
7.8
7.75
7.7
7.65
7.6
7.55
7.5
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

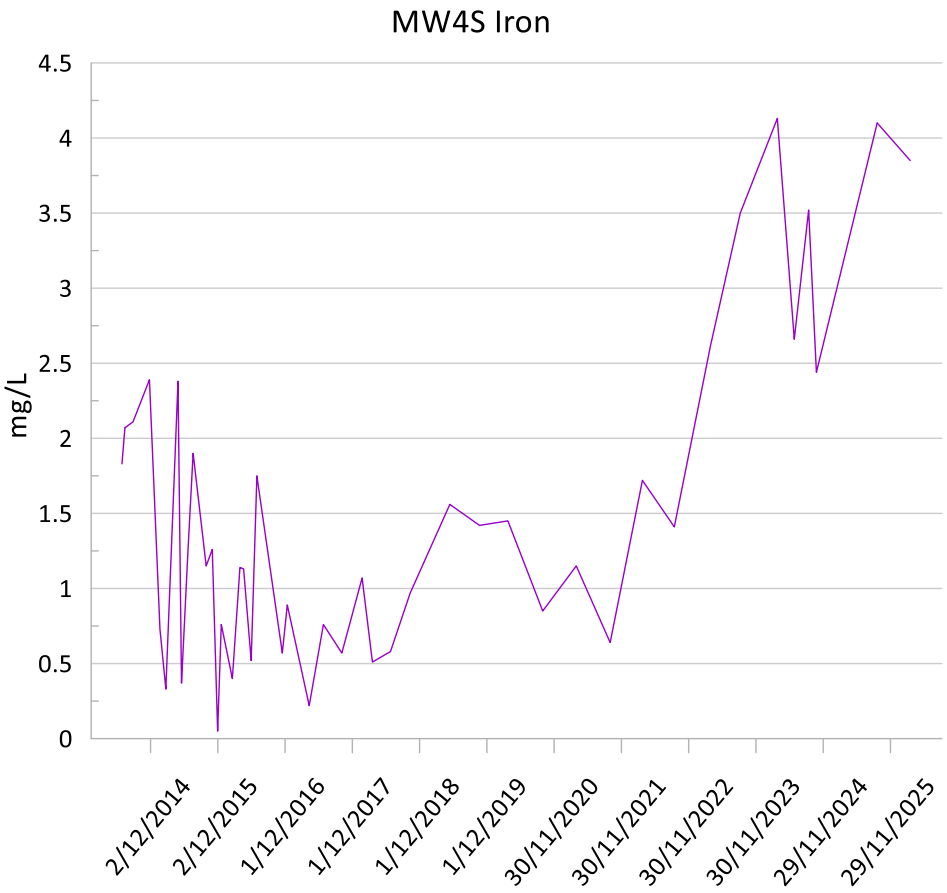

MW08 EC
EC (uS/cm)
2000
1800
1600
1400
1200
1000
800
600
400
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
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29/11/2024
29/11/2025

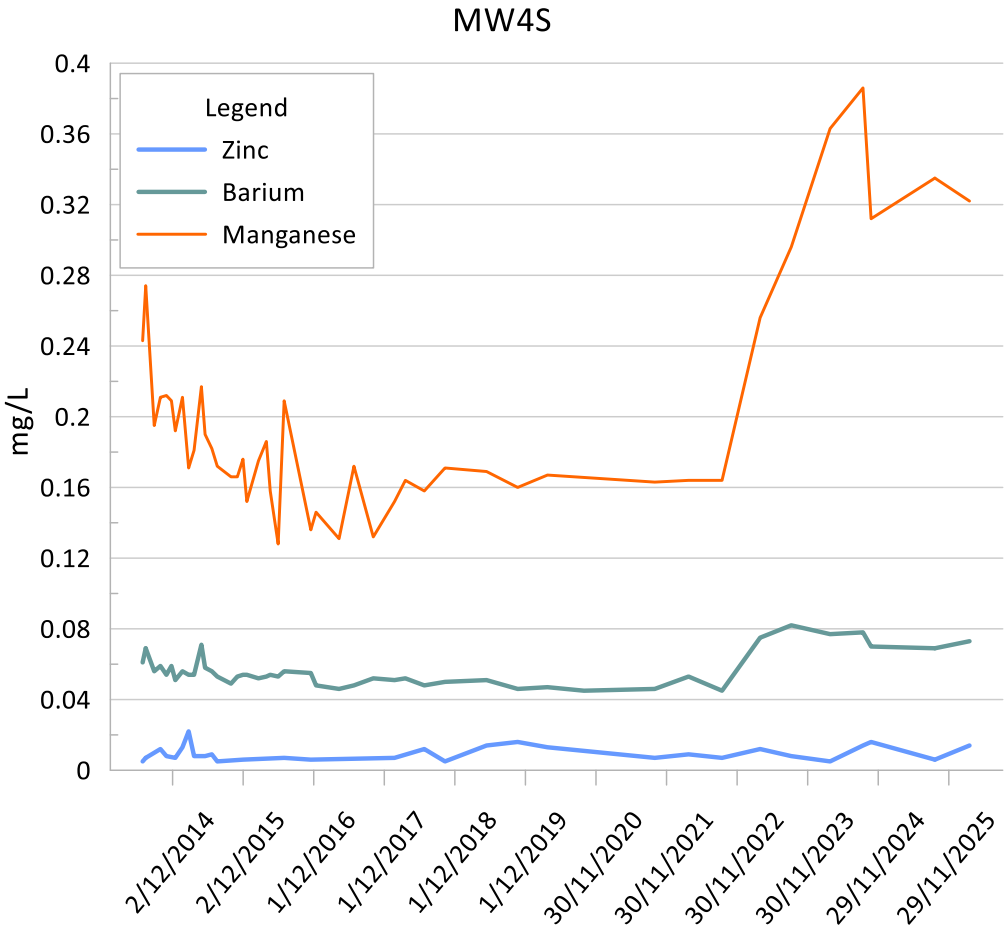

MW09 pH
pH
7.77
7.768
7.766
7.764
7.762
7.76
7.758
7.756
7.754
7.752
7.75
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

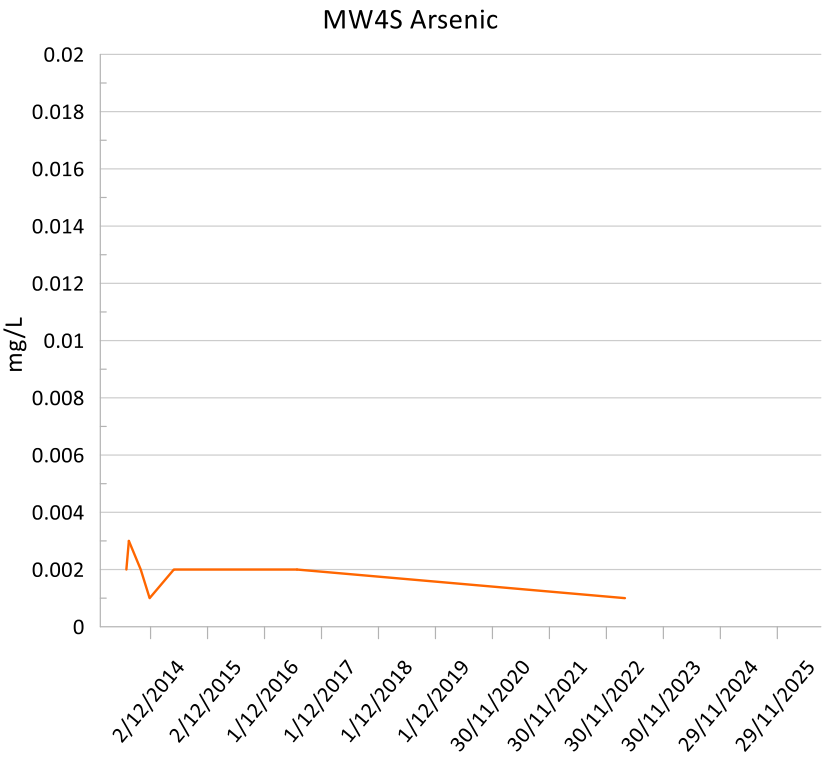

MW09 EC
EC (uS/cm)
2000
1800
1600
1400
1200
1000
800
600
400
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025

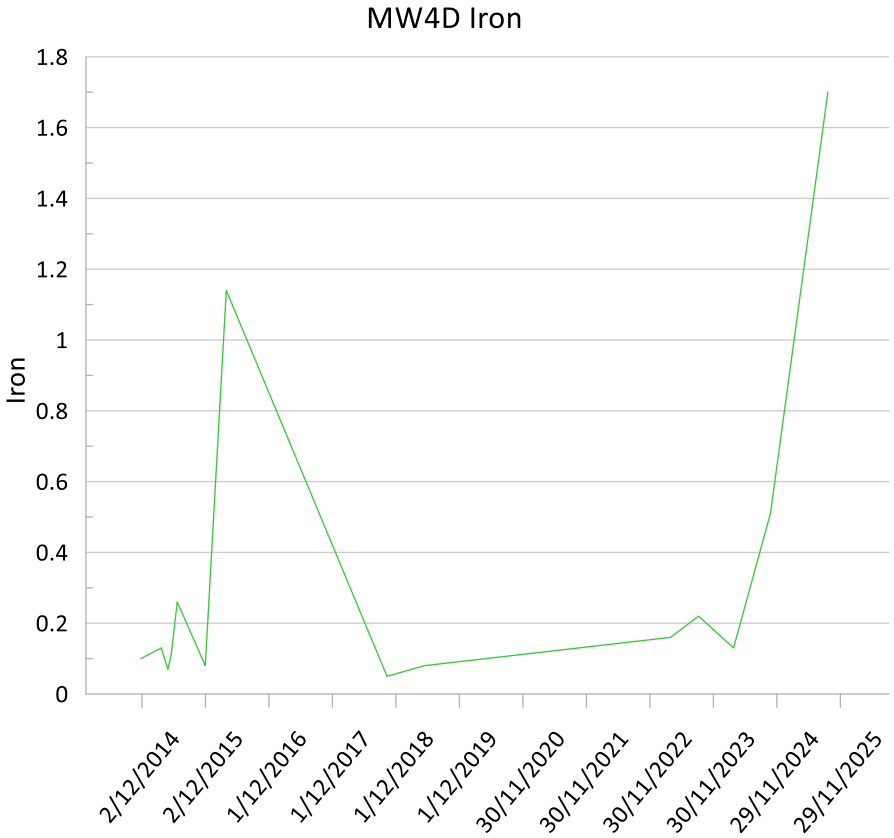
APPENDIX B

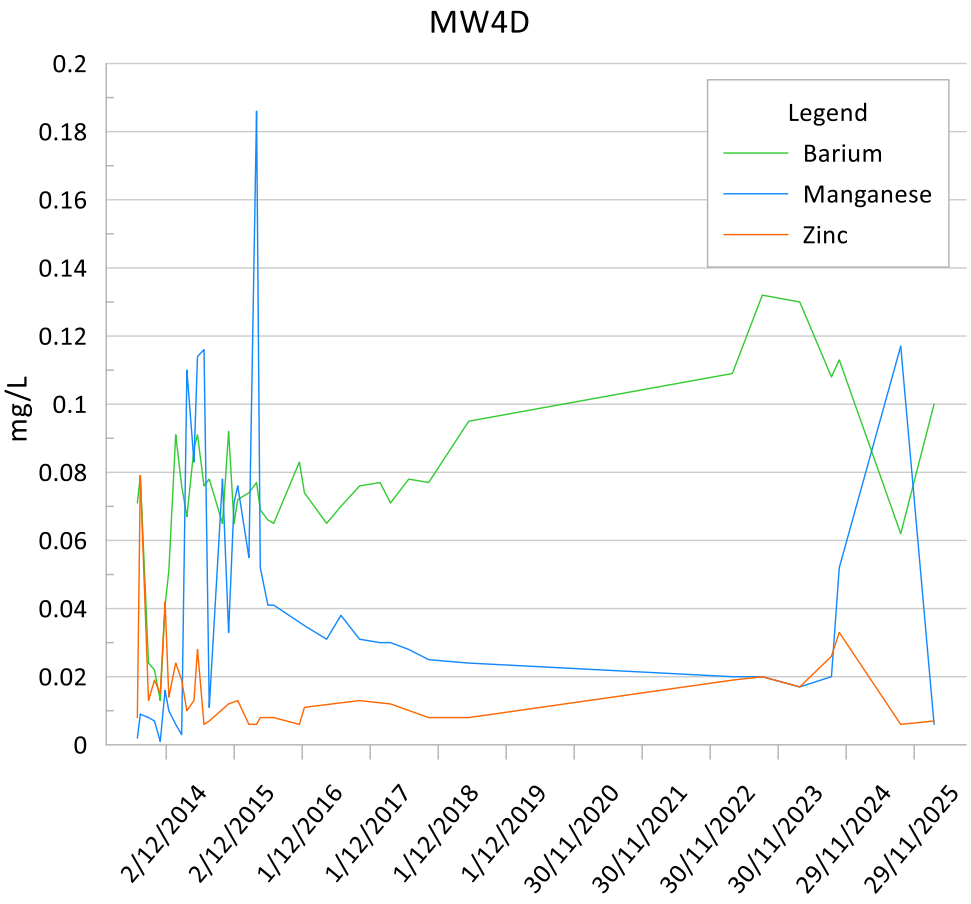
Time series groundwater data for dissolved metals

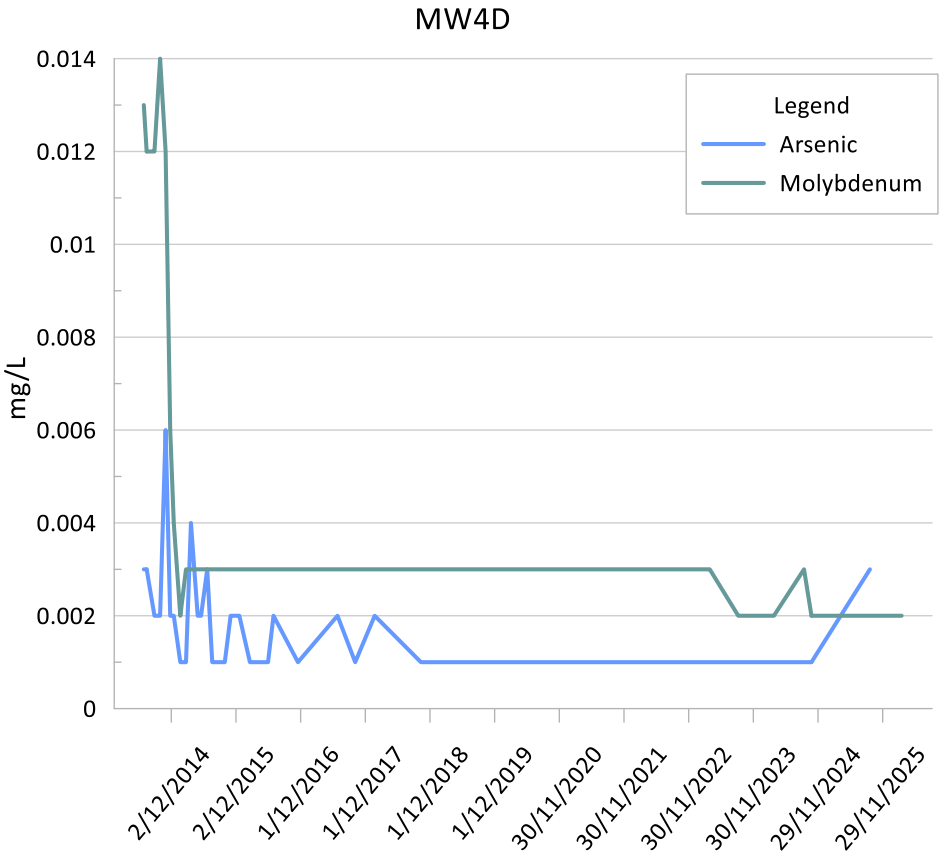

MW4S Iron
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
mg/L
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
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29/11/2024
29/11/2025

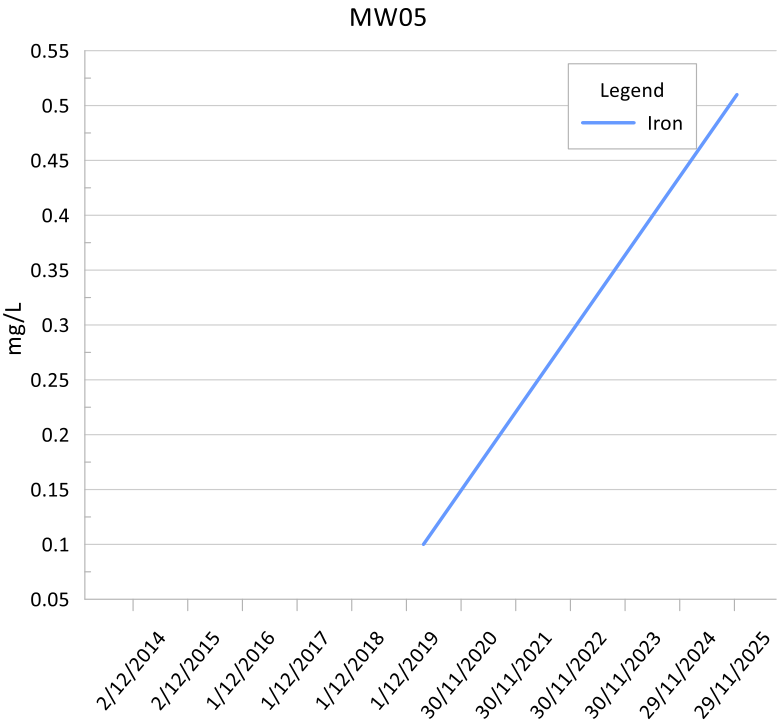

MW4S
Legend
Zinc
Barium
Manganese
0.4
0.36
0.32
0.28
0.24
0.2
0.16
0.12
0.08
0.04
0
mg/L
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
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29/11/2024
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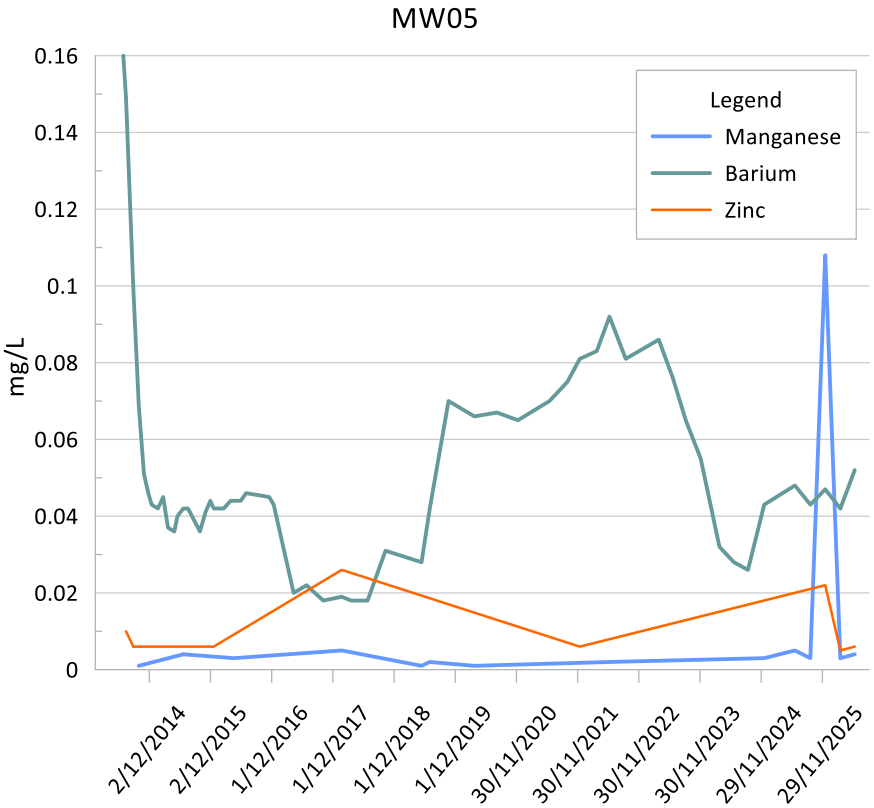

MW4S Arsenic
mg/L
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
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29/11/2024
29/11/2025

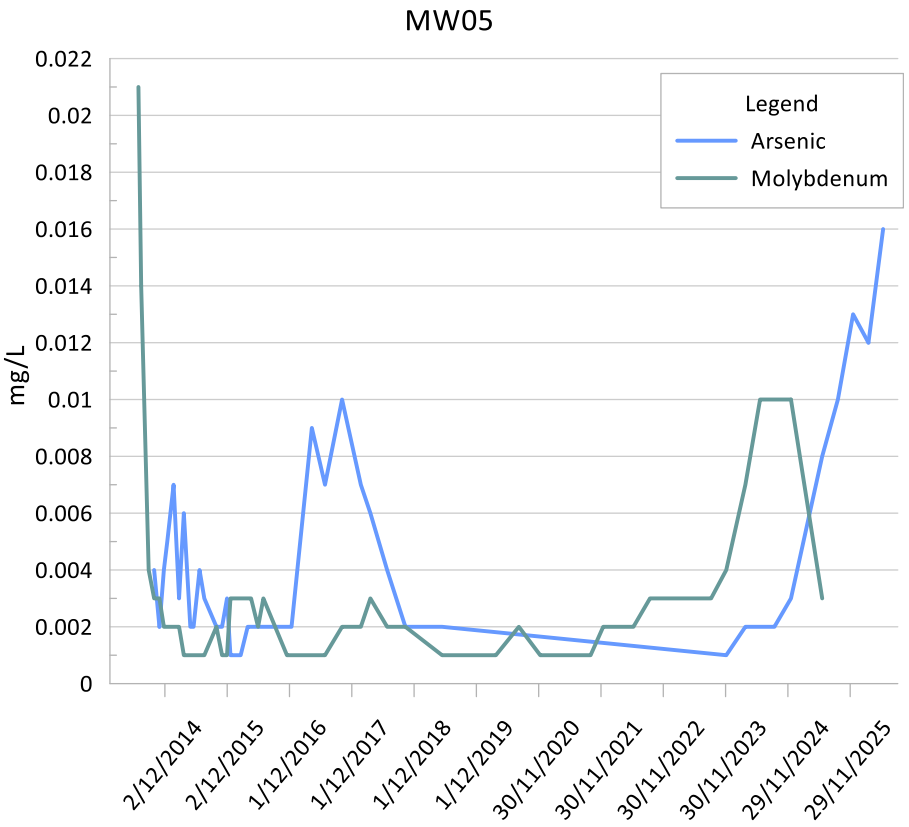

MW4D Iron
Iron
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
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29/11/2024
29/11/2025

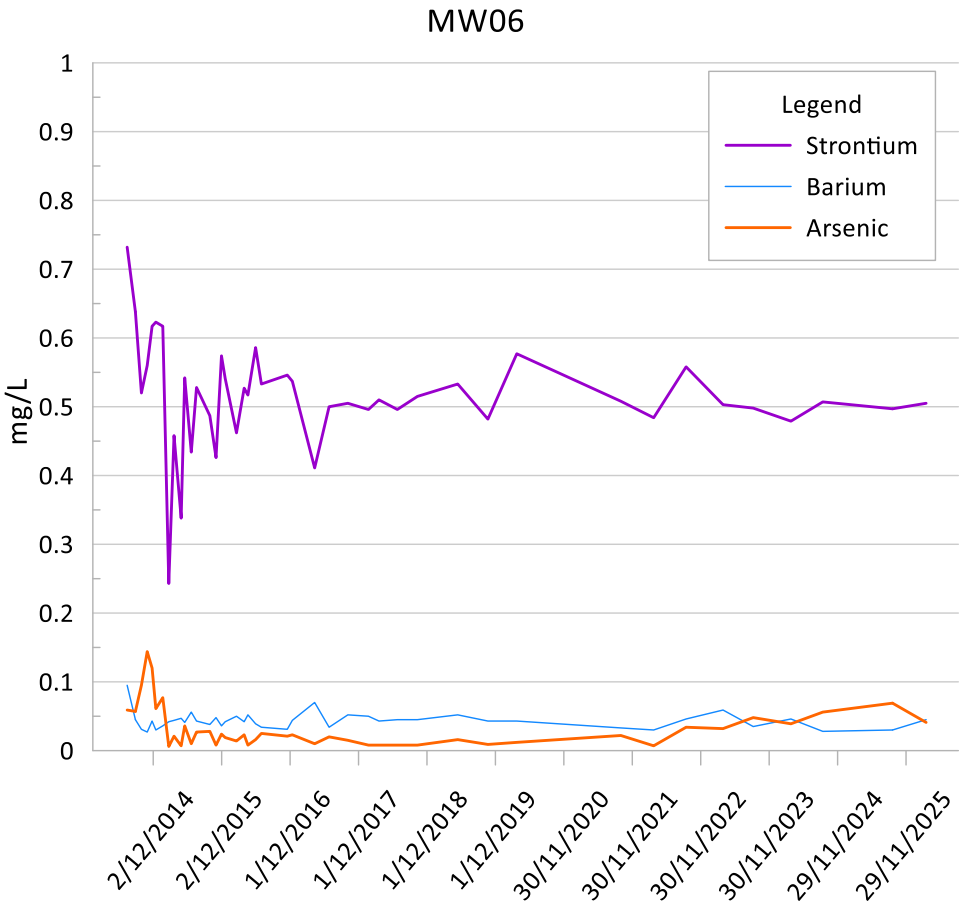

MW4D
Legend
Barium
Manganese
Zinc
mg/L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
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29/11/2024
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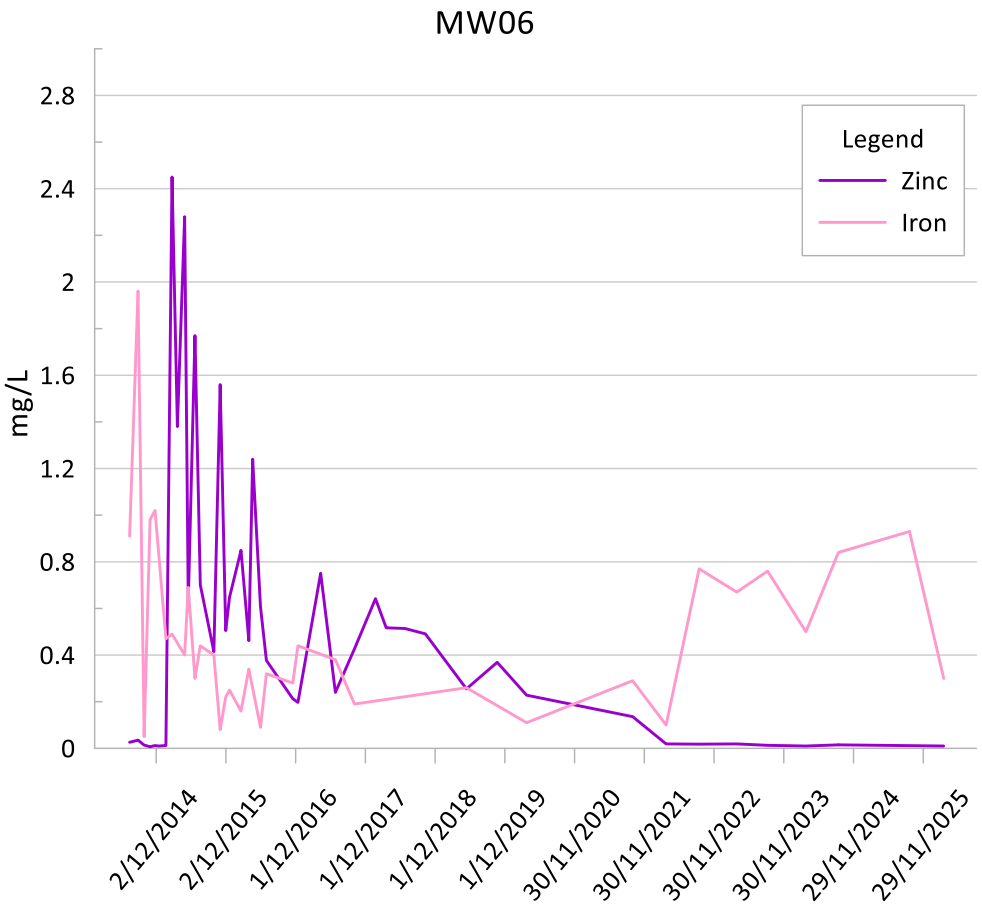

MW4D
Legend
Arsenic
Molybdenum
mg/L
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
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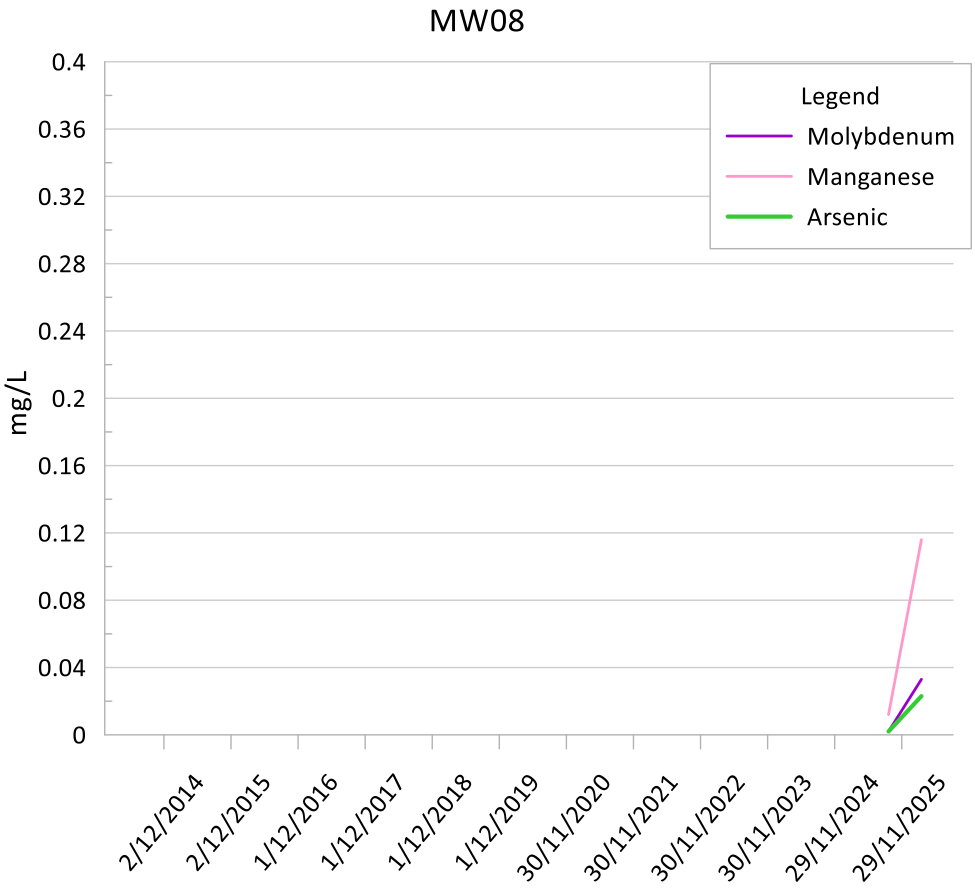

MW05
Legend
Iron
mg/L
0.55
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
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29/11/2024
29/11/2025

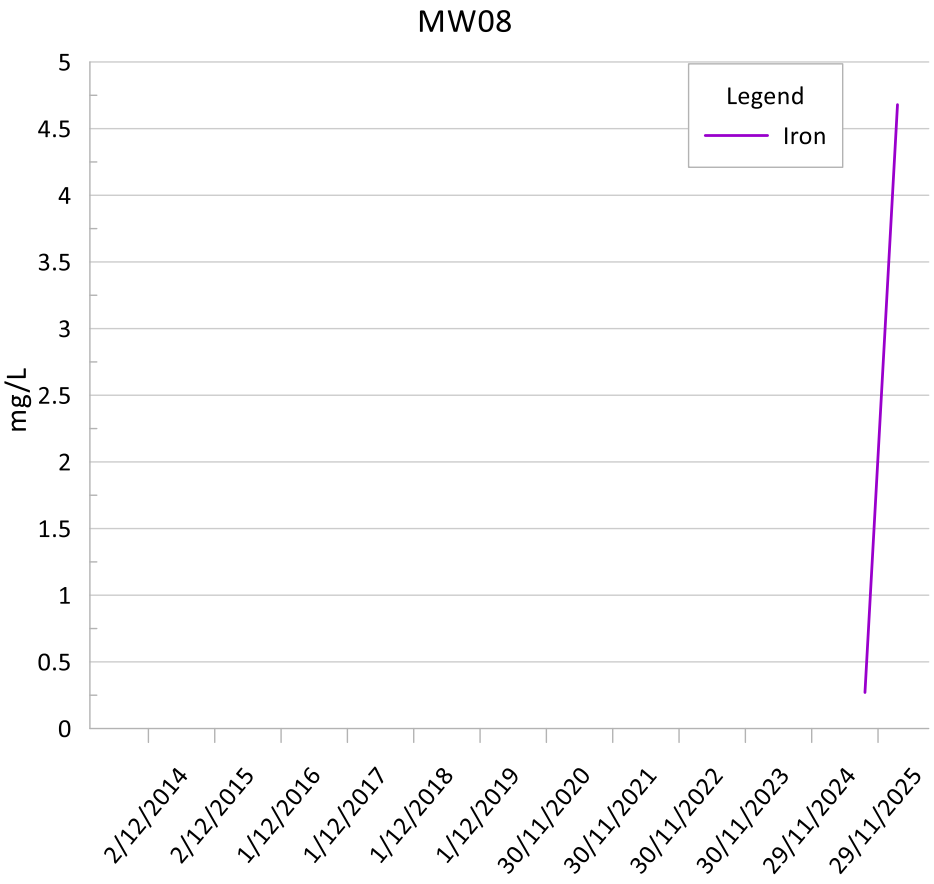

MW05
Legend
Manganese
Barium
Zinc
mg/L
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
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29/11/2024
29/11/2025

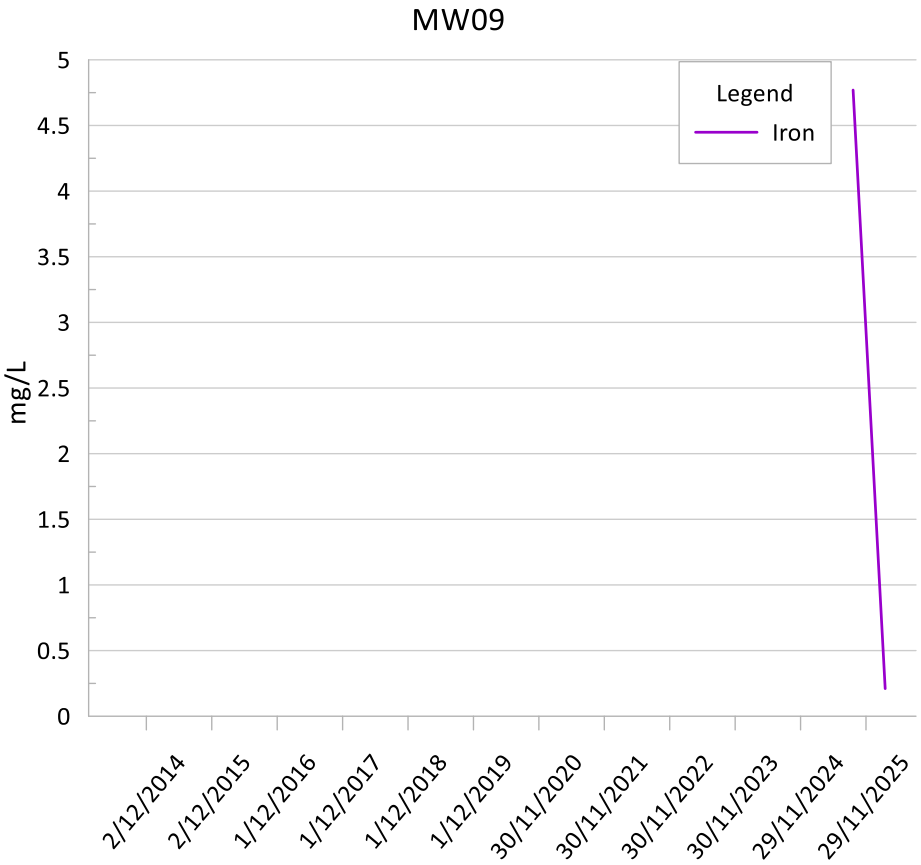

MW05
0.022
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
mg/L
Legend
Arsenic
Molybdenum
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
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29/11/2024
29/11/2025

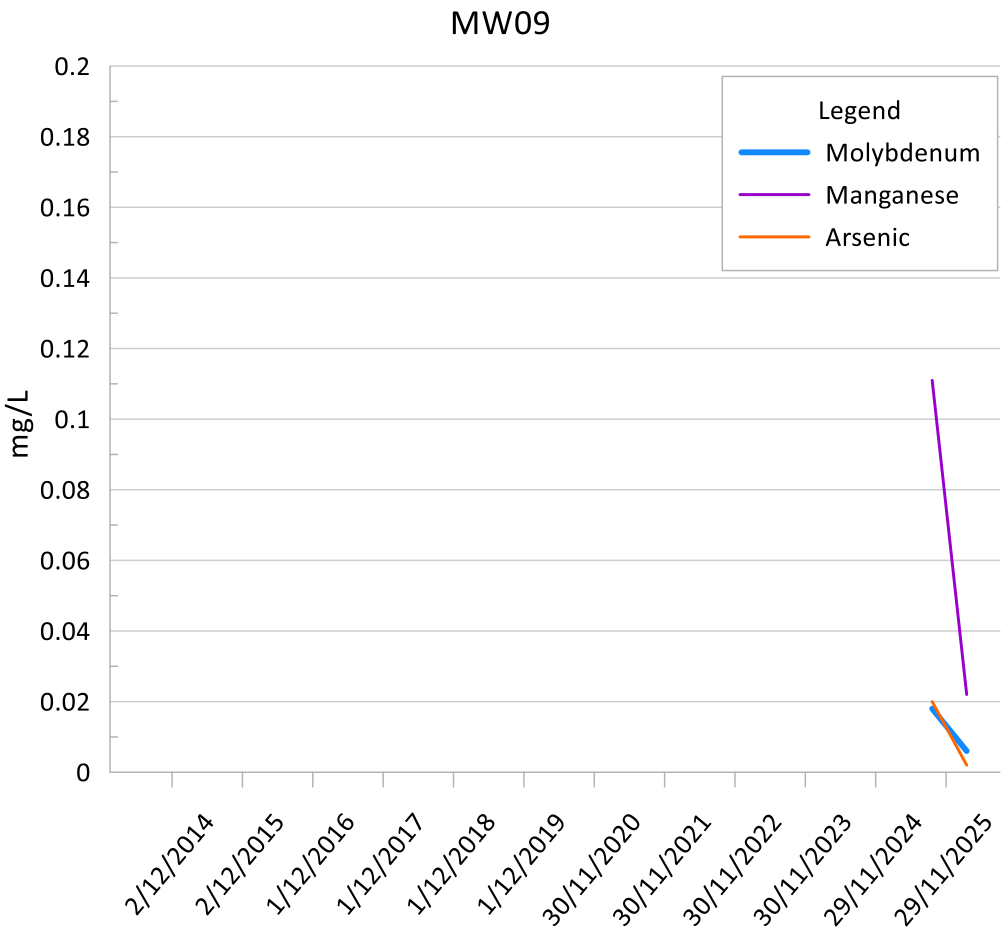

MW06
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
mg/L
Legend
Strontium
Barium
Arsenic
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW06
mg/L
2.8
2.4
2
1.6
1.2
0.8
0.4
0
Legend
Zinc
Iron
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW08
mg/L
0.4
0.36
0.32
0.28
0.24
0.2
0.16
0.12
0.08
0.04
0
Legend
Molybdenum
Manganese
Arsenic
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW08
Legend
Iron
mg/L
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW09
Legend
Iron
mg/L
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025


MW09
Legend
Molybdenum
Manganese
Arsenic
mg/L
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2/12/2014
2/12/2015
1/12/2016
1/12/2017
1/12/2018
1/12/2019
30/11/2020
30/11/2021
30/11/2022
30/11/2023
29/11/2024
29/11/2025