Boral Peppertree Quarry

Annual Review

January – December 2024

Document Control

Prepared by: Ijeoma Ehighibe & Chris Brown
Boral Peppertree Quarry

STATUS	DATE	DISTRIBUTION
Draft	15th January 2025	Andy Coe (Boral Peppertree Quarry Manager) Ijeoma Ehighibe (Stakeholder and Environment Advisor)
Final	28th March 2025	Andy Coe (Boral Peppertree Quarry Manager) Chris Brown (Environment Business Partner)

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Boral Peppertree Quarry

Annual Review (Jan 2024 – Dec 2024)

Name of operation	Peppertree Quarry
Name of operator	Boral Resources (NSW) Pty Ltd
Development consent / project approval #	06_0074
Name of holder of development consent / project approval	Boral Resources (NSW) Pty Ltd
Mining lease #	Not applicable
Name of holder of mining lease	Not applicable
Water licence #	10WA102701,10WA116000 & WAL43829
Name of holder of water licence	Boral Resources (NSW) Pty Ltd
MOP/RMP start date	Not applicable
MOP/RMP end date	Not applicable
Annual Review start date	1st January 2024
Annual Review end date	31st December 2024

I, Andy Coe, certify that this audit report is a true and accurate record of the compliance status of Peppertree Quarry for the period 2024 Calendar Year and that I am authorized to make this statement on behalf of Boral Resources (NSW) Pty Ltd .

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 or $22,000, or both).

Name of authorised reporting officer: Andy Coe	
Title of authorised reporting officer: **Quarry Manager Peppertree Quarry**	
Signature of authorised reporting officer 	
Date 28th March 2025	

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Commonly Used Abbreviations and Acronyms

AR	Annual Review
AHMP	Aboriginal Heritage Management Plan
AHMC	Aboriginal Heritage Management Committee
ANZECC	Australian and New Zealand Environment Conservation Council
AQMP	Air Quality Management Plan
AS	Australian Standard
EC	Electrical Conductivity
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC	Environment Protection and Biodiversity Conservation
EPL	Environment Protection Licence
DO	Dissolved Oxygen
DPE	Department of Planning and Environment
Ha	Hectares
HSE	Health, Safety and Environment
HSEQMS	Health, Safety, Environmental Management System
HVAS	High Volume Air Sampler
kL	Kilolitres
LOR	Limit of Reporting
mgbl	metres below ground level
NATA	National Association of Testing Authorities
NBMP	Noise and Blast Management Plan
NSW	New South Wales
NTU	Nephelometric Turbidity Units
O&G	Oil & Grease
PIRMP	Pollution Incident Response Management Plan
PM_{10}	Particulate Matter (10 microns in diameter)
POEO Act	*Protection of the Environment Operations Act 1997*
RL	Reduced Level
TDS	Total Dissolved Solids
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
$\mu g/m^2$	micro grams per square metre
$\mu g/m^3$	micro grams per cubic metre
WMP	Water Management Plan

1 STATEMENT OF COMPLIANCE

The Statement of Compliance for the 2024 Reporting Period is contained in Table 1.

Table 1: Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
Approval MP 06_0074	No
EPL 13088	Yes
EPBC 2018/8243	Yes

The Non compliances identified during the reporting period are detailed in Table 2. Each non-compliance has been risked ranked as per the DPE Annual Review Guidelines Compliance Status key outlined in Table 3.

Table 2: Non-Compliances

Relevant Approval	Condition #	Condition description	Compliance status	Comment	Where addressed in the Annual review
MP 06_0074	Part B Condition B36	The Surface Water Monitoring Program must include: (a) detailed baseline data on surface water flows and quality in Tangarang Creek and Barbers Creek.	Administrative non-compliant	Water Flow monitoring is not possible within Barbers Creek due to accessibility. Fossickers Flat is a monitoring site for Water NSW in the Shoalhaven River and downstream of the Quarry operations. This site will be used as an alternative with data reviewed regularly to identify any potential impacts. This was approved by the DPIE in response to the Annual review 2020 and is included in the Water Management plan 2021.	Section 7

MP 06_0074	Part B Condition B20	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 6 at any residence on privately-owned land, or on more than 25 percent of any privately owned land. (See table 6 of MP 06_0074)	Non-compliant	A $PM_{2.5}$ sample taken on the 17th December 2024 resulted in a $PM_{2.5}$ concentration of 84.33 ug/m^3. DPHI and the EPA were notified upon receiving the result. An investigation commenced by an air quality consultant. The findings of the investigation determined the result to be erroneous. This investigation was provided to DPHI and the EPA. On 2 other sampling occasions throughout the reporting period the $PM_{2.5}$ recorded results slightly above the 25 ug/m^3. When interpolated to the boundary, the results were within the criteria.	Section 6.3
MP 06_0074	Part B Condition B20	The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 6 at any residence on privately-owned land, or on more than 25 percent of any privately owned land. (See table 6 of MP 06_0074)	Non-compliant	$PM_{2.5}$ rolling annual average above criteria for 51 of 61 samples recorded. When interpolated to the Boral owned boundary as per the Air Quality Management plan, results remained below the annual average criteria of 8 ug/m^3	

Table 3: Compliance Status Key

Risk Level	Colour 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: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	non - compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • 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 (e.g. submitting a report to government later than required under approval conditions)

2 INTRODUCTION

Peppertree Quarry (the Quarry) is owned and operated by Boral Resources Pty Ltd (Boral). The hard rock quarry is located south-east of Marulan in the NSW Southern Tablelands, approximately 175 km south-west of Sydney (refer to Figure 1).

The Quarry was first granted planning approval in February 2007 under Part 3A of the *Environmental Planning and Assessment Act 1979* following the preparation and display of an Environmental Impact Assessment. The project has since been the subject of seven separate modification applications which were approved in March 2009, November 2011, October 2012, August 2016, October 2019, April 2020 and most recently in September 2021.

The Quarry has an identified resource area of approximately 250 million tonnes, which dependent upon extraction rates, would allow quarrying for 70 years or more over an area of approximately 104 hectares (ha), within a 650-ha parcel of land.

All quarry products and materials (granodiorite aggregate products and manufactured sand) are transported by rail to and a capped quantity of trucks to a number of Boral rail terminals for distribution by trucks into the Sydney metropolitan area.

This Annual Environmental Management Report (AR) provides a summary of the Quarry's activities, environmental performance, statutory compliance, and community relationships between the periods of 1st January 2024 to 31st December 2024 (the reporting period).

The AR has been prepared in accordance with the requirements of the Project Approval 06_0074 Modification 7 (Condition D11- PART D), which requires:

D11. By the end of March in each year after the commencement of development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:

(a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;

(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:

(i) relevant statutory requirements, limits or performance measures/criteria;

(ii) requirements of any plan or program required under this consent;

(iii) monitoring results of previous years; and

(iv) relevant predictions in the documents listed condition A2(c).

(c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;

(d) evaluate and report on:

(i) the effectiveness of the noise and air quality management systems; and

(ii) compliance with the performance measures, criteria and operating conditions in this consent;

(e) identify any trends in the monitoring data over the life of the development;

(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and

(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.

Table 4: Condition D11 – specific location of addressed

CoC	Condition of Project Approval	Addressed in Section
D11	By the end of March in each year after the commencement of development, or other timeframe agreed by the Planning Secretary, a report must be submitted to the Department reviewing the environmental performance of the development, to the satisfaction of the Planning Secretary. This review must:	Noted
	(a) describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;	Sections 2, 4, 5, 6, 8, 12
	(b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the: (i) relevant statutory requirements, limits or performance measures/criteria; (ii) requirements of any plan or program required under this consent;	Sections 6, 9 Appendices 2, 3, 4, 5

	(iii) monitoring results of previous years; and (iv) relevant predictions in the documents listed condition A2(c).	
	(c) identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence;	Section 1
	(d) evaluate and report on: (i) the effectiveness of the noise and air quality management systems; and (ii) compliance with the performance measures, criteria and operating conditions in this consent;	Section 6 Appendices 2, 3
	(e) identify any trends in the monitoring data over the life of the development;	Section 6 Appendices 2, 3
	(f) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and	Section 6
	(g) describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.	Sections 8, 12

The AR has also been prepared in line with the DPE Annual Review Guideline October 2015.

Copies of the AR will be submitted to:

- NSW Department of Planning, Housing and Infrastructure.
- NSW Environment Protection Authority.
- Goulburn Mulwaree Shire Council.
- Water NSW;
- DPE Water;
- Biodiversity Conservation Division
- The Peppertree Quarry Community Consultative Committee; and
- Aboriginal Heritage Management Committee.

The report will also be available at the Boral website:

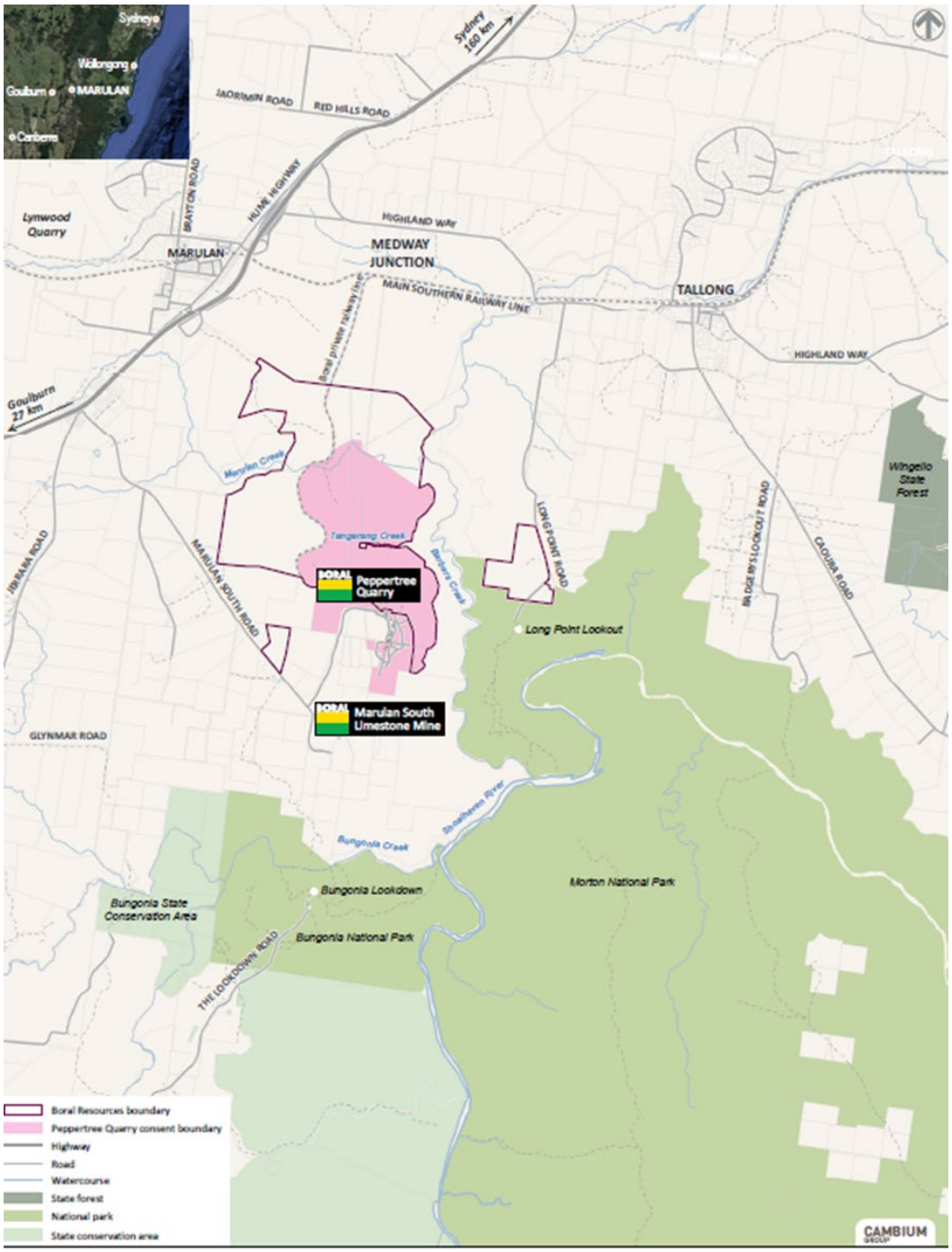
https://www.boral.com.au/locations/peppertree-quarry

Key contacts associated with the management of the Quarry operations, environment, safety, and stakeholder relationships are provided in Table 5.

Table 5: Key Contact Details – Peppertree Quarry

Contact Person	Position Title	Contact Details
Andy Coe	Quarry Manager	Tel: (02) 4841 1701 Email: andy.coe@boral.com.au
Ijeoma Ehighibe	Stakeholder and Environment Advisor	Tel: (02) 4841 1701 Email: ij.ehighibe@boral.com.au

Figure 1: Peppertree Quarry Location



3 APPROVALS

The Quarry operates under several regulatory approvals and licences which are summarized in Table 6 below.

Table 6: Approvals

Approval	Detail	Regulatory Authority
Project Approval 06_0074 Modification 7 (2021)	Quarry operating conditions updated for approval to extend the WOE footprint to relocate a sediment basin P2 and removal of one tree.	NSW Department of Planning and Environment
EPL No. 13088	The EPL is issued for the scheduled activity of: Crushing, Grinding, Separation and Extractive activities for tonnages greater than 2 million tonnes per annum. The EPL was varied in 2024 to align with the Approval conditions for PM2.5 Air quality monitoring	NSW Environment Protection Authority
EPBC 2018/8243	The EPBC approval was issued for the removal of Box Gum Grassy Woodland as part of the Mod 5 (SWOE) works.	Department of Climate Change, Energy, the Environment and Water
WAL25291 nominating 10WA102701	Extraction of 145 ML of surface water from Barbers Creek Water source via a 125mm centrifugal pump and overshot dam	Water NSW
WAL24717 nominating 10WA116000	Extraction of 15ML of groundwater from the Lachlan Fold Belt Greater Metropolitan Groundwater Source via a 165mm bore (This Licence is currently inactive)	Water NSW
WAL43829 nominating 10MW119333	Extraction of 300ML of groundwater from the Lachlan Fold Belt Greater Metropolitan Groundwater Source via an excavation (pit sump)	Water NSW

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:

https://www.boral.com.au/peppertree

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

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

Approval was granted of Modification 7 in September 2021 to modify Peppertree Quarry's operation extending the footprint of the WOE to allow the relocation of a proposed sediment basin P2 and the removal of one tree.

This Annual Return reflects compliance of the operation to the Modification 7 Condition of Consent.

4 QUARRY OPERATIONS

4.1 OPERATIONS LAST 12 MONTHS

Over the last 12 months, the pit has continued to move in a south easterly direction, extending into the area previously housing the oil storage facility and farmhouse office.

The mobile crusher was relocated to the RL525 level and became semi fixed for an estimated 2 – 5 years. This was associated with the construction of a tip bin to make loading of the crusher more efficient.

In pit load and haul operations commenced where raw blasted rock will be carted to the in-pit crusher for processing.

The Southern western overburden emplacement (Modification 5) activities continued but at a significant reduced capacity with full operations deferred, expected to resume July 2026.

Operations occurred within the prescribed hours of operation.

No exploration activities were undertaken.

4.2 OPERATIONS NEXT 12 MONTHS

Over the next 12 months, the pit will continue to move in a south easterly direction.

The Western Overburden Rehabilitation works will continue.

The mobile crusher will remain on the RL525 level and stay semi fixed for an estimated 2 – 5 years, with Load and haul operations continuing to feed raw blasted rock to the crusher.

The South western overburden emplacement (Modification 5) activities will continue with full operations expected to resume July 2026.

4.3 PRODUCTION, SALES AND TRANSPORT LAST 12 MONTHS

During the reporting period, the Quarry produced 2 489 195 million tonnes of aggregate, slightly below the forecasted 2 700 000 million tonnes for the 2024 period. (Refer to Figure 2).

The DRE Production results Form for the Financial Year ending 2024 is contained in Appendix 1.

Project Approval Condition A9 (Part A) requires a capped tonnage of 3.5 million tonnes of quarry products may be transported from the site per annum. During the 2024 calendar year 2 816 968 tonnes of product transported by road and rail to Boral terminals at Maldon, Enfield, and St Peters. This volume included both Peppertree product, as well as Limestone sand.

Road transportation is allowed as per Condition A10, (Part A) – *The Proponent may Dispatch up to two laden trucks containing quarry products per calendar day. Any additional truck Dispatches of quarry products will require the written approval of the Secretary.*

Peppertree Quarry has an authorisation system in place, to manage the requirement for only 2 loads per day to be dispatched. During the reporting period, the Boral Marulan South Limestone (SSD 7009), Conditions of Consent were enacted. Condition A10 of this consent allows"

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.

Peppertree transported 54 926 Tonnes to the shared road sales stockpiling area.

The use of the Apex weighbridge system keeps track of the Peppertree truck movements to avoid exceedance of the truck movement under the Limestone SSD condition.

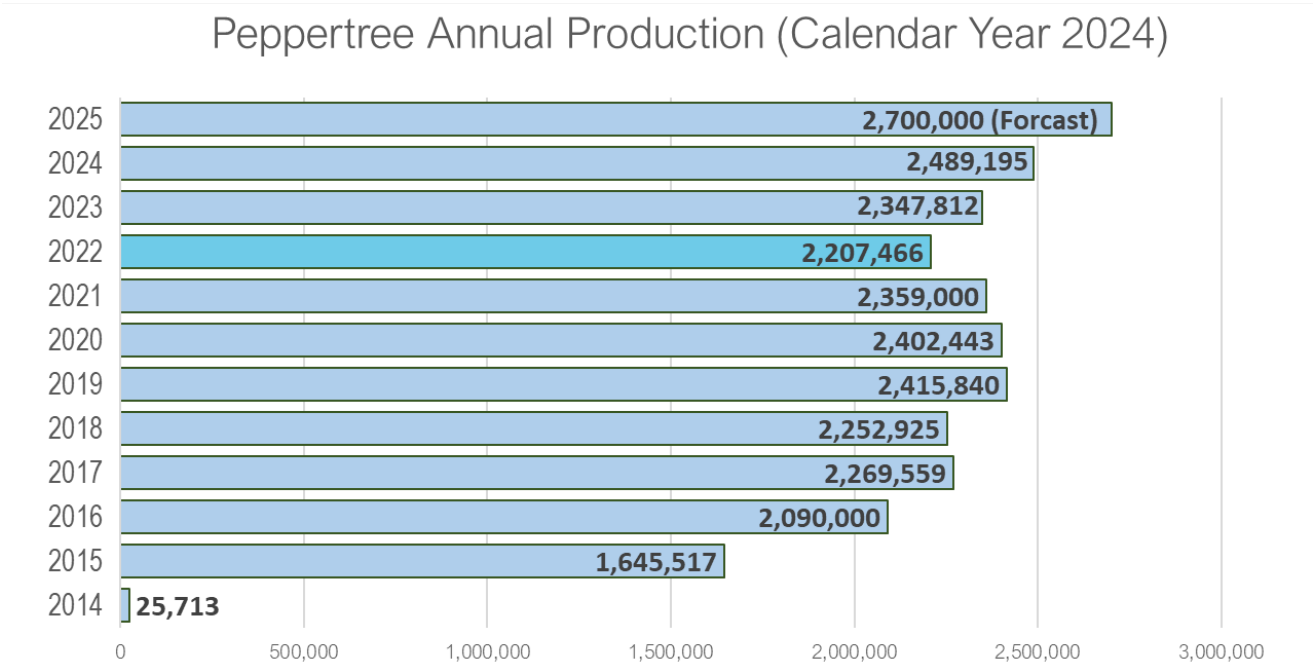
4.4 PRODUCTION, SALES AND TRANSPORT NEXT 12 MONTHS

The anticipated production for 2025, from Peppertree Quarry is 2 7000 000 million tonnes. However, actual realised tonnage will be dependent on market demand and the production levels at other Boral hard rock quarries.

During the 2025 reporting period product dispatch will continue to be mainly via rail.

It is estimated that Peppertree will dispatch via rail and road, approximately 2 850 000 million tonnes, which will also include Limestone sand.

Figure 2: Quarry Production Trends



5 ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

Table 7 lists specific actions from the 2023 AR that were required to have been undertaken during the 2024 reporting period.

Table 7: Actions Required from 2023 AR

Proposed Activities for 2024	Requested by	Status	Where discussed
Undertake progressive Overburden stabilization and rehabilitation and implement recommendations of the 2024 Rapid Visual Assessment and Ecological assessment	Operator	Consultants reports prepared outlining the required scope of works for rehabilitation and erosion and sediment control. Works being progressively undertaken.	Section 8
Review and/or prepare management plans - NBMP, AQMP, BRMP, WMP, EMS, BFMP as per modification 7 approval requirements following approval of AEMR	Operator	Management plans in place and approved. Aboriginal Heritage Management plan pending approval. Plans will be reviewed following AEMR and Independent audit in 2025	Section 6.1
Undertake annual Rehabilitation Rapid Visual Assessment (November 2024)	Operator	Complete. Undertaken by Cambium Group.	Section 8
Undertake 2-year Ecological assessment (November 2024)	Operator	Complete. Awaiting report.	Section 8
Undertake audit of the surface water management system at the Southern Overburden emplacement once system is installed	Operator	Southern Overburden yet to be completed. Audit to be completed once emplacement completed.	Section 8
Finalise Artefact collation/analysis and review and return Artefacts to Country	Operator	Artefact Analysis completed. Reporting to be completed early in 2025 with return to country to occur late in 2025	Section 6.9
Implement Stakeholder Engagement plan for 2024	Operator	Complete	Section 9
Pit expansion to the East and commence south-western overburden as per Modification 5	Operator	Ongoing	Section 4
Redevelopment of ground water wells in line with assessment report	Operator	Report prepared. Further reviewed by consultants determining replacement wells are not necessary.	Section 7.2
Implement real time air monitoring and investigate relocation of air monitoring sampling locations to boundary locations	Operator	Real time air monitoring has been installed. Appropriate locations on the boundary to be determined in 2025.	Section 6.3
Aboriginal heritage final report to be completed in 2024	Operator	Analysis was delayed, delaying reporting. To be completed and submitted in early 2025.	Section 6.9

Undertake geomorphological assessment of overburden emplacements	Operator	Aerial survey of the overburden emplacements in place.	Section 4
Undertake review of frequency of noise monitoring.	Operator	Not actioned. Currently still monitoring as per management plan requirements.	Section 6.4
Undertake Independent Audit	Operator	Complete	Section 10
Undertake and develop future display of the scar trees	Operator	Concept developed approved my AMC. To be built in 2025.	Section 6.9

6 ENVIRONMENTAL PERFORMANCE

The Quarry 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 8 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 8: Summary of Environmental Performance

Aspect	performance during the reporting period	Trend / Key management implications	Implemented / proposed management actions
Deposition gauges	Quarry contribution complies with criteria at the neighbouring 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	Quarry Contribution complies with criteria at the neighbouring residence	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	Continue to monitor and assess performance
PM 2.5 HVAS	Quarry Contribution complies with criteria at the neighbouring residence	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting at the boundary	Investigate and move the air quality monitoring points to the Boral owned boundary
TSP HVAS	Quarry Contribution complies with criteria at the neighbouring residence	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	Continue to monitor and assess performance
Noise	Quarry Contribution complies with criteria at the sensitive receivers	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	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
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	Continue to work with AHMC representatives. Bi-monthly meeting established to ensure all actions are identified and communicated.	Undertake collation of the artefacts and plan to conduct a second “return to Country” activity

Biodiversity and rehabilitation	Complies with BRMP	Rehabilitation continues to do well. Some erosion control needed at identified locations.	Implement recommendations of the Rapid Visual Assessment and Ecological review

6.1 BORAL INTEGRATED MANAGEMENT SYSTEM

Peppertree Quarry 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 Peppertree Quarry Environmental Management System that was updated and approved in July 2024.

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

6.2 METEOROLOGICAL MONITORING

In accordance with Project Approval Condition B26 (Part B), the Quarry continues to utilize the onsite weather station established upon the commencement of the quarry development.

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

A monthly review of the Weather station data is undertaken by a consultant to confirm that the station and the data are within operational compliance limits.

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

The Quarry operates an air quality monitoring system in accordance with the Air Quality Management Plan (AQMP) that was updated and approved in September 2024.Management actions have been accordingly developed and are outlined in the AQMP.

6.3.1 Deposition Dust Monitoring

There are three dust deposition gauges used for monitoring of larger dust particles (typically >50µm) that settle out from the air and are referred to as depositional dust. All gauges are located on Boral owned land (refer Appendix 2).

The dust deposition gauges were sampled monthly (+/- 2 days) during the reporting period with the corresponding results from the gauges comprising insoluble matter and ash residue (mineralogical).

Condition B20 (Part B) of the Project Approval requires that long term deposited dust emissions do not exceed an annual average criterion of 4 g/m^2/month at any neighbouring residence or privately owned land.

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 Quarry. 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 Quarry activities.

As all deposition gauges are located on Boral owned land, a review of the monitoring data and gauge locations was conducted by Todoroski Air Sciences during the reporting period. The monitoring data collected was interpolated to the neighbouring residences (in line with Condition B20 Part B) with no exceedances recorded to occur above the criteria (Refer to Appendix 2 for results). As part of the review, it has been previously recommended that at least 2 of the

gauges be relocated. The potential relocation of the deposition gauges will be further reviewed in the 2025 reporting period, using existing data to analyse concentration changes with a broader dataset.

The monthly results and annual averages recorded during the reporting period from the three dust deposition gauges (D1, D2 and D3) are detailed in Appendix 2.

6.3.1.1 Deposited Dust – Performance Review (2024)

For much of the 2024 reporting period, Sites D1, D2 and Site D3, were below the criteria of 4g/m^2/month, with the exception of 7 occurrences. For the 4 samples above 4 g/m^2/month at site D3, the analysis shows the insoluble solids content, made up an average of 75% of the total sample concentration. This is an indication that the samples are likely to have had some level of organic matter, which is not generally representative of mineralogical based quarry dust.

All sites were below the criteria of 4g/m^2/month when the recorded data was interpolated to the boundary.

6.3.1.2 Long Term Trend Analysis and assessment (2014 – 2024)

Dust Deposition modelling for the EA (2006) was based upon conservative assumptions and indicated that the annual average dust concentrations and deposition levels would be below relevant air quality criteria at the nearest residential properties.

Modification 6 (April 2020) also modelled that the dust concentrations would remain below the relevant air quality criteria.

The dust deposition results, when assessed at the boundary of the operations, have consistently been below the criteria, since operations commenced in 2014 and therefore are in line with the predictions of the EA and the latest Modification.

6.3.1.3 Deposited Dust Summary and opportunities for improvements

As the dust gauges are situated on Boral owned land and not at the Boundary, monthly interpolation of the data will continue to assess compliance. A Real Time dust sampler was installed in 2022 and will continue to monitor throughout 2025 with a view to gather information to support a relocation of gauges D1,D2 and D3 to the boundary.

6.3.2 PM2.5, PM10 and TSP High Volume Samplers (HVAS)

The three HVASs are on Boral owned land, situated together (refer to appendix 2) 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.

Condition B20 (Part B) of the Project Approval requires that the operation of the Quarry must meet the PM2.5, PM_{10} and TSP criteria presented in Table 9 at any neighbouring residence or privately owned land.

Table 9: TSP, PM10 and PM2.5 Criteria

Pollutant	Averaging period	Criteria
TSP	Annual average	90 µg/m^3
PM_{10}	Annual average	30 µg/m^3 Changed to 25 µg/m in July 2020
	24-hour average (short term impact)	50 µg/m^3
$PM_{2.5}$	Annual average	8 µg/m^3

	24-hour average (short term impact)	25 µg/m^3

It has been identified that the HVAS are not located at the boundary of the Peppertree Quarry and 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. Details of the interpolated data are included in Appendix 2.

6.3.2.1 PM2.5, TSP and PM10 – Performance Review (2024)

Graphical results for the annual average of TSP, PM10 and PM2.5 for the 2024 reporting period are contained in Appendix 2.

Results for TSP annual average were within the Project Approval criteria of 90 µg/m^3.

Results for PM10 24-hour average (short term impact) and annual average were within the Project Approval criteria of 50 µg/m^3 and 25 µg/m^3 respectively.

As of July 2020, the PM10 Annual average criteria was reduced to 25 µg/m^3, as per Modification 6.

Results for PM2.5 24-hour average (short term impact) remained below the Project Approval criteria of 25 µg/m^3 for the majority of the reporting period with the exception of three occasions. A PM2.5 sample taken on the 17th December 2024 resulted in a PM2.5 concentration of 84.33 ug/m^3. DPHI and the EPA were notified upon receiving the result. An investigation was commenced by an air quality consultant, taking into account weather conditions and quarry operations at the time. Findings of the investigation determined the result to be erroneous. Wind directions on the day indicated the HVAS were not downwind of the quarry operations. This investigation was provided to DPHI and the EPA.

On 2 other sampling occasions throughout the reporting period the $PM_{2.5}$ recorded results slightly above the 25 ug/m^3. These 2 occasions were the 23rd November 2024 and 23rd December 2024 giving measured results of 26.08 ug/m^3 and 26.66 ug/m^3 respectively, When interpolated to the boundary, the results were 2.1 ug/m^3 and 0.0 ug/m^3, well below the 25 ug/m^3 criteria.

Recorded results for PM2.5 remained on or above the annual average goal of 8 µg/m^3 for majority of the reporting period. When interpolated to the boundary the annual average remained consistently below the 8 µg/m^3 criteria.

6.3.2.2 Long Term Trend Analysis and assessment – PM2.5, TSP and PM10

The TSP monitoring results have all been below the average annual criteria of 90ug/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 and Modification 6 predicted annual averages.

The PM10 monitoring results have all been below the average annual criteria of 30ug/m^3, until January 2020, where the impact of bushfire smoke was seen on the PM10 levels measured. In July 2020, the criteria was reduced to 25ug/m^3 and levels had remained above this annual average criteria until December 2020. The long term result has consistently been below the criteria since December 2020 and throughout the 2024 reporting period.

The PM_{10} results have all been under the 24-hour average criteria (50ug/m^3) with the exception of a number of specific events in 2015, early in 2016, 2017, 2018, 2019, 2020 and on one occasion during 2021. However, when interpolated to the boundary, all results were determined to be below the relevant criteria in Table 9.

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 and Modification 6 predicted annual averages, taking into account the impact of smoke from bushfires.

Problems have been experienced with the consistent operation of the PM10 sampler at the end of 2020 and beginning of 2021. Similarly, problems were experienced with the consistent operation of the TSP sampler in late 2021 and early

2022, with some improvement observed following maintenance and repair of the machine. A backup High Volume Air sampler was used to ensure consistent sampling during periods of equipment failure.

The measured PM2.5 results remained under the 24 hour average criteria (8ug/m3) between May 2022 until January 2024. Results prior to this period, were usually above the criteria, similarly seen with the 2024 annual average results. When interpolated to the boundary, results remained below the criteria.

6.3.2.3 PM2.5, PM10, TSP Summary and opportunities for improvements

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 shown in Table 9. A Real Time air sampler was installed in 2022 reporting period and continue to monitor throughout 2024 to assess levels at the boundary with the potential for future relocation of the static HVASs.

6.4 NOISE

The Noise and Blast Management Plan May 2024 (NBMP) provides the framework and guidance for the Quarry activities to be conducted in a manner such that appropriate control measures are implemented to minimise the potential for adverse impacts on the amenity, property and safety of quarry neighbours and to ensure compliance with the Project Approval CoA requirements. A number of management actions have been put in place to assist in meeting these objectives with guidance on performance occurring through the implementation of a quarterly noise monitoring program. This plan was reviewed, updated and approved by DPHI in 2024.

The results and a general review of the quarterly noise monitoring program conducted during the reporting period are presented in Appendix 3.

In accordance with NBMP, operational noise assessments are conducted on a quarterly basis. During the reporting period noise assessments were conducted in March, July, October and December.

Attended monitoring is conducted during both day and nighttime periods to enable measurement of operational noise from quarry activities conducted during the Project Approval permissible hours of operation. Unattended monitoring is generally continuous between the device deployment and collection, measuring noise levels for all assessment periods.

Operator attended noise measurements are conducted at or near the locations specified in Table 2 of Project Approval Condition B3 Part B. Appendix 3 shows the receiver locations required to be monitored.

Table 10 presents the criteria for receiver locations required to be assessed in accordance with Condition B3 (Part B) of the Project Approval and EPL Condition L2.

Table 10: Operational Noise Assessment Criteria

Residential Receiver Locations	Noise Assessment Criteria			
	Day (7am to 7pm)	Evening (7pm to 10pm)	Night (10pm to 7am)	
	LAeq (15 min)	LAeq (15 min)	LAeq (15 min)	LA1 (1Min)
R3	40	35	35	52
R2	40	35	35	52
R8	40	35	35	52
Any other noise sensitive residential	40	35	35	52

receiver location (R4 & R17)				

A real time noise monitor has been installed and is in operation at the Residential Receiver R3. A procedure has been developed as to the management of quarry noise, based upon real time noise measurements and weather conditions.

6.4.1 Noise Management Performance Review

A summary of the maximum day and night time noise assessment measurements against the respective Project Approval compliance criteria for LAeq (15 minutes) noise levels (Condition 3B – Part B) is provided in Appendix 3.

A summary of the maximum night time noise assessment measurements against the respective Project Approval compliance criteria for measured LA1 (1 minute) noise levels at all receiver locations is also provided in Appendix 3. The assessment results found that the LA1 (1 minute) noise levels were in compliance at all receiver locations, with the averaged levels being considerably lower than the respective prescribed limits under the Project Approval.

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.

In 2024 the residential receiver located at R4 requested noise monitoring no longer occur at the premises. The noise monitoring consultant developed an alternative location known is R4a. Attended and unattended noise monitoring occurs at this alternate location and modelled to the residence of R4.

6.4.2 Long Term Trend Analysis and Assessment

Long term trend analysis has been undertaken on monitoring data for residential receivers R2, R5, R6 and R16 as monitoring commenced prior to operations in 2014. Analysis on residential receivers R4 and R17 has been undertaken since October 2016.

Extended hours of operation for in pit activities commenced in August 2016, however no noticeable variation has been identified in the noise monitoring.

Graphical representations of the noise monitoring results (estimated Quarry LAeq [15 minute and 1 min) contribution sourced from the quarterly monitoring reports) are contained in Appendix 3. The monitoring results have generally remained consistently below criteria since the commencement of operations at all locations.

Noise modelling for both the 2007 EA and Modification 6 indicated that all receiver locations will experience noise levels below the criteria. Sleep disturbance and cumulative noise impact due to the operations are not considered likely.

The quarterly noise monitoring data has found that the quarry achieved compliance with the approved operating noise criteria at all locations for the majority of the time and therefore is in line with the predicted models.

6.4.3 Noise summary and opportunities for improvement.

A review of the noise monitoring frequency will be undertaken during 2025. Quarterly noise monitoring has been undertaken for 12 years since the commencement of the operation of the quarry. An assessment will be made and discussions held with the EPA and DPE as to a change in frequency if it is warranted.

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6.5 BLASTING

All blasts are conducted in accordance with the Noise and Blast Management Plan May 2024.

Monitoring of overpressure and ground vibrations at four nominated sensitive receptors is conducted during every blast (refer to Appendix 4 for locations).

As part of every blast air, overpressure and ground vibration is monitored for compliance with the relevant assessment criteria in the Project Approval.

Conditions B12 and B13 (Part B) of the Project Approval requires that air-blast overpressure and ground vibration should not exceed the criteria in presented Tables 11 and 12, respectively, at any residence on privately-owned land.

Table 11: Air-blast Overpressure Impact Criteria

Air-blast overpressure (dB Lin peak)	Allowable Exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

Table 12: Ground Vibration Criteria

Peak Particle Velocity (mm/s)	Allowable Exceedance
5	5% of the total number of blasts over a period of 12 months
10	0%

6.5.1 Blast Management Performance Review

Blast monitoring results for over pressure and ground vibration collected during the reporting period are presented in Appendix 4. The maximum measurements for over pressure and ground vibration were 117.1 (18/9/24 – B5) and 9.89 mm/sec (24/04/24 – B2)

The Quarry conducted 44 blasts during the reporting period, all of which complied with Project Approval criteria.

All blasts were performed in accordance with the following Environmental Performance Conditions under Part B of the Project Approval:

- Monitored for overpressure and ground vibration levels (Conditions B12 and B13 respectively);
- Best practice considerations associated with safety and minimisation of fumes and dust (Condition B16); and
- Notifications to neighbours and public information (Condition B16).

6.5.2 Long Term Trend Analysis and Assessment

Graphical representations of the blast monitoring results since the commencement of operations are presented in Appendix 4.

For both parameters, 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.

Since the first AR reporting period in 2014, the Quarry has conducted 512. All blasts were found to be compliant with Airblast Overpressure and Ground Vibration blasting criteria as predicted in the EA.

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 quarry 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.

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 13.

Table 13: Waste Management Methods for Peppertree Quarry

Waste	Waste Classification	Management Method	Contractor
Oil absorbent pads	Solid general waste	Once used, bagged and placed in bin for landfill providing no liquid oil present.	Cleanaway – local Council landfill
Food scraps	Solid general waste	Bagged and placed in bin for landfill	Cleanaway – local Council landfill
Disposable Coffee Cups	Solid general waste	Coffee cups are made of compostable materials rather than polystyrene. Currently cups are bagged and placed in the bin for landfill.	Cleanaway – local Council landfill
Screen mats	Solid general waste	Placed in nominated bin for recycling	Cleanaway
Oil filters	Solid general waste once oil has been drained	Drained of oil, placed in bin for recycling	Cleanaway
Oily rags / waste	Solid general waste	Oily rags are bagged and placed in bin for landfill	Cleanaway – local Council landfill
Plastic / Glass bottles / Aluminium cans	Solid general waste	Separated in the crib room and offices for recycling.	Endeavour Industries
Office Paper and Cardboard	Solid General waste	Separated in the crib room and offices for recycling	Endeavour Industries
Cardboard	Solid general waste	Separated at the workshop and warehouse and placed in specific cardboard bins	Cleanaway – recycling
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. Scrap belting is placed in a designated bin for recycling.	Fenner Dunlop or Spice Tech with belt on sold for mainly agricultural uses. Scrap conveyor belt is recycled by Cleanaway

Waste	Waste Classification	Management Method	Contractor
Oil drums	Solid general waste	Drained on site, stockpiled in designated area, and crushed for recycling	Fast Skips
Empty IBC Containers	Solid general waste	Stockpiled in designated area and returned to supplier	Polo Citrus
Steel	Solid general waste	Offcuts and parts are placed in designated steel skip bins for recycling	Fast Skips
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	Clean away
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.	Bridgestone, Premier Tyres, Molycop
Timber pallets	Solid general waste	Pallets and timber waste are placed in designated timber skip bins for recycling. Pallets in good condition will be returned to the supplier where possible	Clean away
Photocopy toners	Solid general waste	Bagged and posted for recycling	Onsite management
Sewage Effluent	liquid waste	Above ground absorption trench on site.	Onsite management
Batteries	Solid general waste	Collected and recycled through regional facilities	Onsite management
Manganese Crusher liners	Solid General waste	Placed in designated skip bin and recycled	Fast Skips
Tungsten tips	Solid General waste	Placed in designated skip bin and recycled	Fast Skips
E Waste	General solid waste	Collected and recycled through regional facilities	Onsite management
General rubbish	General	General solid waste	General rubbish
Overburden	Virgin excavated natural material (VENM)	Emplaced within approved designated emplacements on site	Onsite management
Granodiorite Fines	Virgin excavated natural material (VENM)	Emplaced within approved designated emplacements on site	Onsite management
Scalps	Virgin excavated natural material (VENM)	Stockpiled on site prior to sale	Onsite management
Asbestos waste	Asbestos waste	Waste was removed by experts prior to the demolition of old farmhouse	GBAR
Demolition waste	Solid General Waste	Stockpiled on site prior to removal	Bingo
Paint Waste	Liquid waste	Stockpiled on a pallet prior to removal	Cleanaway

6.7 DANGEROUS GOODS AND HAZARDOUS MATERIALS MANAGEMENT

The Quarry 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.

The only Dangerous Goods Licence pertaining to the Quarry is for two aboveground double skinned bunded diesel tanks, one being 100 kl that is used for refuelling locomotives, the other being 60 kl used to refuel contractors heavy machinery. The WorkCover Notification (NDG200221) was issued on behalf of an on-site contractor who operates and maintains the 100kl refuelling facility. The Contractor's operation and management of the facility is audited on a regular basis for compliance.

6.8 BUSH FIRE MANAGEMENT

Part B, condition B76 requires the quarry to:

(a) Prepare a Fire management plan in consultation with NSW RFS Southern Tablelands District office, within six months of approval of Modification 5;
(b) Ensure the project:
    (i) Provides for asset protection in accordance with the relevant requirements in the *Planning for Bushfire Protection* (RFS, 2006) guideline 5;
    (ii) Ensure that there is suitable equipment to respond to any fires on site; and
(c) Assist the RFS and emergency services to the extent practicable if there is a fire in the vicinity of the site.

Peppertree quarry has in place an extensive fire management system, which is audited by independent experts on a quarterly basis.

Emergency response plans contain details for bush fire management and response.

As per Part B Condition B76 a Bush Fire Management plan was prepared and reviewed by NSW RFS Southern Tableland District Office, before being approved in May 2020. This plan was reviewed in 2024 however only administrative changes were required. No substantive changes were made to the content.

For the 2024 reporting period, there was no requirement to use the Bushfire emergency response plans.

6.9 HERITAGE CONSERVATION

The Aboriginal Heritage Management Plan (AHMP) was updated in 2024 to reflect management associated with the current quarry activities. This updated plan is awaiting approval.

The AHMP continues to provide the framework for the identification, protection, conservation and presentation of Aboriginal cultural values at the Quarry with the primary objectives of the AHMP to identify, protect, conserve, present and transmit the Aboriginal heritage values associated with the land, on which the Quarry activities are conducted.

Aboriginal Heritage Site works were undertaken during 2022 on the Mod 5 site prior to the construction commencement of the SWOE. Approximately 800 artefacts were salvaged as part of the MSL055 management measures. A report has been prepared detailing the outcomes of the management measures. No Aboriginal artefacts were salvaged during the reporting period.

Five scarred trees were relocated from the South-East of the quarry pit due to the expansion of the pit footprint to a temporary storage area South-West of the quarry pit following the involvement and advice of the Peppertree Quarry Aboriginal Heritage Management committee (AHMC). A decision to develop and confirm design with the AHMC the future display of the scar trees within the Peppertree quarry site will be undertaken during the 2025 reporting period.

The analysis of approximately 25 931 Aboriginal artefacts was completed in the 2024 reporting period, with the report detailing findings of the analysis to be completed early in the 2025 reporting period. This report will be prepared by a qualified archaeologist and reviewed by the AHMC, prior to submission to DPHI and Heritage NSW.

The construction of the Aboriginal Scar Tree display is to be completed in the 2025 reporting period. The final Return to Country will also take place in the 2025 reporting period, for the Aboriginal Artefacts not held back for educational purposes.

Termite management was installed at the scar trees in March 2024. 12 bait stations 2m apart have been placed around the perimeter of the trees. These are monitored every 2 / 3 months and refilled as necessary

Regular meetings have continued to be held with the Aboriginal Heritage Management Committee and within the reporting period three meetings were held with the Committee in March, April and November. The agenda covers future quarry operations, possible community projects and the implementation of the Boral Reconciliation Action Plan.

7 WATER MANAGEMENT

Surface and groundwater is managed in accordance with a Water Management Plan (WMP), which was reviewed and approved by DPHI in 2024.

Table 14 provides an overall summary of the environmental performance of the quarry in regard to water management, with further details provided in the following sections.

Table 14: Summary of Environmental Performance – Water Management

Aspect	performance during the reporting period	Trend / Key management implications	Implemented / proposed management actions
Surface water quality	No results were over the trigger levels for 3 consecutive samples requiring detailed investigation	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	Continue management and monitoring
Environmental flow	Complies with criteria	Data collected over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	Continue management and monitoring
Groundwater standing level	Complies with criteria	Data over time is consistent with the EIS predictions, Modification modelling and previous AR reporting	Continue management and monitoring
Groundwater quality	Results are consistent with trends and show no marked variations in water quality nor any impacts	Data collected over time has been consistent within each groundwater well.	Review trigger levels and review and update monitoring well mapping including the WMP inline with consults report.

	associated from quarry operations		

7.1 SURFACE WATER

Surface water management at the Quarry is conducted in accordance with a Water Management Plan (WMP) 2024.

In accordance with Condition B33 (Part B) of the Project Approval, the WMP includes a surface water quality program that involves quarterly sampling from the Tangarang Creek, Dam 1, the upstream culvert, Marulan South Creek and overflow from any sediment ponds during extreme storm events. (Refer to Appendix 5 for sampling locations).

This condition also details that the Surface Water monitoring program includes…

"(a) detailed baseline data on surface water flows and quality in Tangarang Creek and Barbers Creek"

Tangarang Creek is sampled on a quarterly basis, with Barbers Creek sampled twice a year. Sampling is conducted either by Peppertree or Marulan South operations. Flow is measured in Tangarang creek as part of the Environmental flow requirements for Peppertree Quarry.

No surface water flow data is obtained from Barbers Creek. This area is difficult to access, and the use of solar powered flow monitoring equipment has been investigated and found not to be suitable. Flow data is available further downstream in the Shoalhaven River at a Water NSW monitoring site (Fossickers Flat). Data associated with this site is contained at Appendix 5.

The quarry has a practice to ensure sediment ponds associated with overburden emplacements are emptied within 5 days of a rain event, by pumping the water to the main pit, so there is sufficient capacity in the dams for the next rain event. During the reporting period, Peppertree Quarry experienced a significant rain event in June 2024, receiving 135 mm of rainfall over a three-day period. Water samples were collected upstream and downstream on June 6, 2024. However, due to safety concerns, samples from the three discharging sediment ponds were taken the following day.

Water entering the main dam from upstream recorded 151 mg/L of suspended solids and 96.4 NTU for turbidity, while downstream measurements were 129 mg/L and 77.7 NTU, respectively. The three sediment ponds sampled during discharge had an average of 55 mg/L for suspended solids and 60 NTU for turbidity. These results indicate that the quarry's impact on water quality was minimal

The Quarry's main Dam provides environmental flows into the ephemeral Tangarang Creek and as such the downstream water quality is largely representative of the discharges, with some minor natural variations from the wider catchment influences.

The suite of parameters analysed for each water quality sample collected is listed in Table 15.

Table 15: Summary of Creek Water Quality Parameters

Laboratory Analysis of analytes		
Total Dissolved Solids (mg/L)	Potassium (K+)	Bicarbonate (HCO_{3-})
Total Suspended Solids (mg/L)	Magnesium (Mg2+)	Nitrate (NO_{3-})
Turbidity – Laboratory (NTU)	Sodium (Na+)	Nitrite (NO_{2-})
TPH C10-C36	Ammonia (NH4+)	Total Nitrogen
Benzo[a]pyrene	Chloride (Cl-)	Total Phosphorous
Naphthalene	Sulphate (SO42-)	Faecal coliforms (cfu/100mL)

Calcium (Ca2+)	pH

The Water Management Plan outlines trigger levels for the suite of analytes in line with ANZECC guideline recommendations.

Table 16 summarises the trigger values used to assess any potential impacts on the water quality in creeks in the vicinity of the Quarry. However, it should be noted that observations to date indicate that while the water quality in the Shoalhaven River mostly meets the ANZECC ecosystem protection levels, the upstream contributing creeks do not. Therefore, the trigger values shown in Table 15 are adopted as benchmark goals, rather than performance or compliance criteria.

Table 16: Water Quality Trigger Values

Indicator	ANZECC Default Trigger for Ecosystem Protection[1]	WaterNSW Benchmarks for Catchment Streams	Proposed 'Triggers'
pH	6.5 – 7.5	6.5 – 8.0	6.5 – 8.5
EC (µS/cm)	30 – 350		400-1,500
Total nitrogen (mg/L)	0.25	<0.25	1.1
Total phosphorus (mg/L)	0.02	<0.02	0.09
Turbidity (NTU)	2 - 25	0 - 25	

[1] Default trigger values for physical and chemical stressors for South-east Australia for slightly disturbed ecosystems (upland river)

The trigger values are applied as follows for ongoing monitoring in Tangarang Creek (both upstream and downstream of any influence from the Quarry):

- If the upper bound for pH, EC, total suspended solids or turbidity is exceeded for a period of three consecutive months downstream of the quarry but is not exceeded upstream of the quarry, this would be the trigger to undertake further assessment of potential sources within the Quarry.
- If the additional assessment finds that the change in water quality may be affected by quarry operations, then further investigation would be required to identify the source of the water quality impact, and review and revise practices to minimise the impact.

This further assessment would include investigation of the potential pathways for water quality impacts within the Quarry area in order to identify whether the change in water quality is attributable to quarry activities, and the nature of activity that has caused the change.

7.1.1 Surface Water Monitoring Results

The quarterly surface water quality monitoring data is presented in Appendix 5. Due to the ephemeral nature of Tangarang Creek, the upstream monitoring point (U1) had zero flow for 2 of the 4 of the monitoring events during the reporting period.

7.1.2 Surface Water Management Performance Review

The Quarry surface water quality trends are generally consistent over the 2024 reporting period with historic trends (refer to Appendix 5).

The results for pH were in the range of the trigger levels (i.e. pH 6.5 to 8.5).

Fluctuations in Total Dissolved Solids (TDS) during the reporting period were all below the ADWG guideline value of 500 mg/L (ANZECC (2000)), with the exception of 1 sample from the main dam and Marulan South creek due to the presence of cattle dung in the creek and to low flow event in the dam.

Turbidity levels were generally consistent over the 4 sampling periods in 2024 and in most cases were below the ANZECC guideline for every sampling location.

Total Nitrogen and Phosphorous are indicators of nutrient levels in water systems and results are depicted in Appendix 5.

Total Nitrogen levels recorded for the Dam, reflected rain events and fluctuated over the reporting period. Samples collected from the T1 location remained below the Trigger criteria for 2 of the 4 monitoring events, in both instances U1 and Marulan South creek displayed higher results.

Total Phosphorus levels remained low and below trigger levels at T1 and the Dam during the first, second, third and fourth quarters, apart from T1 during the second quarter.

All results for hydrocarbon and Polycyclic Aromatic Hydrocarbons (PAHs) were at concentrations below the Laboratory levels of reporting (LORs).

No results in the T1 Creek Samples for any of the above parameters were found to exceed the trigger levels for 3 consecutive samples, which were attributable to quarry operations and would require a detailed investigation.

7.1.3 Long Term Trend Analysis and Assessment

Long term trend analysis has been undertaken on pH, TDS, Turbidity, total Phosphorus and total Nitrogen with the results presented in Appendix 5.

pH is consistently between the range of 6.5 to 8.5, with some higher than usual levels occurring in the Dam in rain or low flow events. Levels at T1 downstream have consistently remained within the trigger levels. Barber Creek samples are also consistently below the trigger levels.

Long term TDS levels recorded at the Dam, T1 and U1 sites have remained below the ADWG guidelines, for the majority of the time since rain events in 2013. Barbers Creek levels have fluctuated over time and will be influenced by other factors rather than the quarry.

For the majority of time, Turbidity in both the Dam and for the T1 samples have been below the ANZECC criteria. Turbidity has been over the criteria at both sites in times of large rain events, when water from the catchment above enters the dam and downstream creek.

Total Phosphorus levels fluctuate over time at all sampling sites. For most of the time, levels were below the trigger criteria for all sites. Levels increased in the Dam and at Marulan south creek at the end of 2018, which may be attributed to outside activities associated with local farming practices. Levels were higher than usual in February 2020 and March 2022 in relation to a significant rain events. Marulan South Creek levels increased in December 2023.

Total Nitrogen levels have fluctuated over time. Samples collected from the T1 location have continued to be below trigger levels since 2014, with the exception of storm related events. This was evident throughout the 2023 reporting period with two monitoring points Dam and Marulan South Creek seeing elevated nitrogen levels in the December quarter, potentially attributed to increased rainfall and inflow from the catchment above the quarry.

The initial EA and management plans predicted compliance with the appropriate ANZECC and ADWG criteria based on limited background sampling. With the exception of periods of storm events, the results obtained from surface water analysis has been in line with the EA predictions and the criteria.

Overall, there would appear to be no impact to T1 and Barbers Creek from quarry operations.

7.1.4 Environmental Flows

Under Project Approval Condition B31 (Part B), the supply of 10% of daily inflows into the Quarry main dam must be provided as environmental flows to Tangarang Creek. The monthly averages of inflow and outflow volumes in comparison with the required 10% of environmental flow requirement are presented in Table 17. The environmental flows were above the 10% requirement each month despite the drier and hotter weather condition throughout the reporting period.

Overall, for 2024 the quarry complied with the 10% environmental flow requirement.

No surface water flow data is collected from Barbers Creek. This area is difficult to access, and the use of solar powered flow monitoring equipment has been investigated and found not to be suitable. Flow data is available further downstream in the Shoalhaven River at a NSW Water monitoring site (Fossickers Flat). This site has been in operation since July 1977. Data associated with this site is contained in appendix 5.

Fossickers Flat data shows a consistent water level in the river with increases in water level and flow associated with rainfall events.

Table 17: Environmental Flow Data (2024)

Month (2024)	Inflow (Megalitres)	Outflow Requirement (10%)	Outflow (Megalitres)	Compliance
January	46.6	4.66	134.23	Yes
February	58	5.8	840.61	Yes
March	3.9	0.39	21.28	Yes
April	51	5.1	685.21	Yes
May	45	4.5	971.15	Yes
June	46.7	4.67	1078.3	Yes
July	9.9	0.99	231.21	Yes
August	25.5	2.55	220.12	Yes
September	0.8	0.08	4.9	Yes
October	0.4	0.04	5.21	Yes
November	0.1	0.01	5.06	Yes
December	20.9	2.09	6.23	Yes
Total	308.8	30.88	4358	Yes

7.1.5 Surface water summary and opportunities for improvement

Results over the operation of the Quarry show little detrimental impact on the downstream environment in Tangarang creek and Barbers Creek.

Water management strategies need to remain in place with ongoing quarterly monitoring at nominated sites. Flow monitoring data will continue to be reviewed from Fossickers Flat.

7.2 GROUNDWATER

The Quarry WMP includes a groundwater monitoring program aimed to be conducted quarterly of five shallow and seven deep piezometers ranging from between 15 m to 100 m in depth (refer to Appendix 5). The groundwater

monitoring is undertaken in general accordance with AS 5667.11 – 1998 Water Quality Sampling – Guidance on Sampling of Groundwaters.

The groundwater monitoring program has been undertaken for 8 years since commencing in October 2015 and continued through 2024.

The installation of additional wells as per a previous report has been re-assessed, determining the failed bores at Peppertree Quarry no longer need to be replaced because the existing monitoring network has already confirmed the key findings of the original Environmental Assessment. The remaining bores provide sufficient data to verify that the quarry continues to have minimal impact on local and regional groundwater resources. Additionally, most of the failed bores were twin locations, meaning their loss has not significantly reduced the overall dataset. Instead of replacing the failed bores, the report recommends monitoring a nearby private production bore to further validate the assumption that the quarry is not affecting external groundwater users.

Assessment of groundwater results is undertaken following each monitoring round with any analytes above trigger levels being noted. In instances where trigger levels are exceeded in two consecutive rounds of monitoring, further assessment is undertaken to determine whether the potential anomaly is the result of quarrying activities or due to natural variability.

Ground water flow was mapped and shows a pattern of very slow recharge due to the nature of the granodiorite and with a direction of flow towards the pit. RPS, groundwater consultants who undertook the monitoring (until mid 2022) and assessment have advised….

“Groundwater at the site appears to flow in the direction towards the pit, which is acting locally as a sink. Considering the low hydraulic conductivity of the aquifer, risks to the receiving environment from any contamination that may be present in groundwater are likely to be low. “

The groundwater field sampling measurements, standing water levels and the Laboratory analytical results from the quarterly groundwater sampling completed during the reporting period are presented in Appendix 5.

7.2.1 Groundwater Management Performance Review

Groundwater monitoring first commenced in October 2015. Groundwater results and trends presented in Appendix 5 and discussed below are in the early stages of a long-term monitoring program which will generate a greater data set from which more detailed and accurate interpretation of any potential or actual impacts on groundwater may be occurring through quarry activities.

The pH levels varied considerably between the respective piezometers with a range of 5.86 to 8.69 throughout the reporting period.

Field measured Electrical Conductivity (EC) during the reporting period ranged from 502 to 3697 uS/cm, indicative of fresh to brackish water quality. EC trends are relatively stable and consistent between each of the piezometers.

Dissolved oxygen (DO) trends showed a high degree of variability in individual and between respective piezometers throughout the reporting period but did not indicate any degradation in water quality.

Standing water levels remained relatively stable in each of the piezometers. PQ5 is identified as the sentinel water bore and over the last 12 months has remained steady over the 4 monitoring periods.

Key findings from the analytical results were:

- Concentrations of nutrients (total nitrogen and total phosphorous) are above the trigger values in most of the piezometers throughout the reporting period, and as such it is believed that these levels are representative of

background levels. In field filtering, has identified that the nitrogen is accounted for by total Kjeldahl nitrogen (sum of ammonia and organic nitrogen) and supports that the nitrogen is more likely to represent an agricultural influence than quarry operations.

- Organic analyses (oil & grease, polycyclic aromatic hydrocarbons, volatile and semi-volatile total recoverable hydrocarbons and benzene, toluene, ethyl benzene, xylenes and naphthalene) were not detected at the majority of the piezometers. On a limited number of occasions, Oil and grease or TPH was detected in single bores.

For all the other analytes, all piezometers across the site showed levels in line with the historic trends and below the trigger values.

7.2.2 Long term trend and assessment

pH trends have remained relatively stable in each piezometer since the commencement of the monitoring program in 2015. The pH levels have varied considerably between the respective piezometers with a range of neutral to alkaline. These levels occur in both in pit groundwater bores as well as those outside of any influence from quarry activities.

The early EC trends are relatively stable and consistent between each of the piezometers. Variations appear to occur consistently across most of the bores and are most likely in response to recharge rain events.

A rapid decrease in Dissolved Oxygen (DO) trends occurred from the development of the piezometers in 2015 through to 2016. Spikes in DO have occurred in several of the piezometers during 2017 and 2018 and are likely to have been influenced by recharge rain events. For 2019, a change was made in the measurement of the DO to better identify any issues within the groundwater. There has been no indication of water quality degradation through the variable DO results.

Standing water levels remained stable in each of the piezometers, with some fluctuation due to rainfall events. PQ5 is identified as the sentinel water bore and shows some reaction to rainfall events since 2015. The standing Water level has fallen less than 2metres since monitoring commenced, and therefore has not triggered any need for investigation, required if the level falls 5m or more.

Key findings from the analytical results were:

- Concentrations of nutrients (total nitrogen and total phosphorous) were above the trigger values in most of the piezometers, and as such it is believed that these levels are representative of background levels. In field filtering of samples was undertaken in 2020 and showed total Kjeldahl nitrogen (sum of ammonia and organic nitrogen), accounts for the Total Nitrogen and supports that the nitrogen is more likely to represent an agricultural influence than quarry operations. A technical review of the nutrients undertaken in 2021, showed levels were not associated with quarry operations.

- Organic analyses (oil & grease, polycyclic aromatic hydrocarbons, volatile and semi-volatile total recoverable hydrocarbons and benzene, toluene, ethyl benzene, xylenes and naphthalene) have been detected at times in some of the piezometers. These have been one off occurrences and on investigation have not been associated with quarry operations. It is more likely to be associated with development of the piezometers or laboratory level of detections.

For all the other analytes, all piezometers across the site showed levels above the trigger values at times.

A review of these occurrences show that the results are consistent with previous trends and do not indicate marked variations or impacts in water quality.

7.2.3 Ground water summary and opportunities for improvement

A review of the data over the sampling rounds, since 2015 has shown results above trigger values.

A review of these results show that they are consistent with previous trends and do not indicate marked variations in water quality nor any impacts associated from the quarry operations.

RPS, groundwater consultants who undertook the monitoring (until mid 2022) and assessment have advised….

"Groundwater at the site appears to flow in the direction towards the pit, which is acting locally as a sink. Considering the low hydraulic conductivity of the aquifer, risks to the receiving environment from any contamination that may be present in groundwater are likely to be low. "

An assessment of the overall groundwater well network was undertaken in 2021 to determine what wells need to be reestablished. This has been further reviewed and determined the failed bores at Peppertree Quarry no longer need to be replaced because the existing monitoring network has already confirmed the key findings of the original Environmental Assessment. The remaining bores provide sufficient data to verify that the quarry continues to have minimal impact on local and regional groundwater resources. Additionally, most of the failed bores were twin locations, meaning their loss has not significantly reduced the overall dataset. Instead of replacing the failed bores, the report recommends monitoring a nearby private production bore to further validate the assumption that the quarry is not affecting external groundwater users.

8 REHABILITATION

During the 2024 AR period, a total of 141.02 ha of Quarry land remained disturbed. All works have continued within the existing disturbed footprint. Rehabilitation works in 2024 have focussed on maintenance, infill planting and repairs on existing areas.

Hydro mulching occurred of approximately 26 000 m^2 during the 2024 reporting period on the western overburden emplacement. A sterile cover crop with the addition of native tree and grass to was used to provide initial stabilisation with the native seed to germinate over several years.

Table 18 presents the total estimated areas of disturbance and rehabilitation.

Table 18: Areas of Disturbance and rehabilitation

Area Reference	Total Disturbed Area (ha)	Total rehabilitated Area (ha)	Disturbed Area during 2024 (ha)	Rehabilitated Areas as of the end of 2024 (ha)
1: Infrastructure area – (Primary, STQ and TLO)	25	0 (Not applicable till end of life)	0	0
2: Quarry extraction area	46.5	0 (Not applicable till end of life)	0	0
3: Eastern overburden emplacement	17.9	2.0	0	0
4: west pad	0	0	0	Now included in SWOE disturbance
5: Overburden emplacement / Noise bund	12	12.1	0	0

6: Dam and creek rehabilitation area	10	10.3	0	No further rehabilitation work required. Now in maintenance
7. Heritage salvage	13.2	0	0	0
8. Western overburden emplacement	4.6	0	0	2.6
9. Southern overburden emplacement	11.52	8.3	0	0
10. South Western Overburden Emplacement (SWOE)	27.68	0	0	0
Total area Disturbed / Rehabilitated as of the end of 2024	168.4	32.7	0	0

A Biodiversity and Rehabilitation management plan was prepared and discussed with the Biodiversity Conservation Department in 2021 in accordance with Development Consent Condition B60 (Part B). The finalised plan was issued to DPE being approved in 2022. This plan has been reviewed, updated and approved by DPHI in 2024.

As Part of the Quarry's rehabilitation monitoring program, the annual Rapid Visual assessment was undertaken in November 2024. This assessment was conducted by independent consultant Mark Nolan and Emilie Mascarenhas of Cambium Group.

The assessment recommended that the following be considered in the next 12 months of rehabilitation maintenance planning:

- Serrated Tussock: Immediate spraying before seed set, followed by monitoring and removal of new growth.
- Blackberry: Increase spraying efforts as per the Weed Management Plan.
- Erosion on reshaped areas: Use light earthworks, hydro mulch, or reseeding to stabilize affected areas.
- Erosion on access road: Assess road necessity; consider decommissioning and revegetation.
- Dam access: Inspect site and reinstate access for maintenance and monitoring.
- Tree guards: Replace, secure, and straighten damaged guards; replant trees as needed.
- Vegetation establishment: Implement RIP, hydro mulch, and supplement plantings for canopy and understory development.
- Slope regeneration: Continue monitoring natural regeneration to support ecological connectivity.
- Canopy supplementation: Plant additional eucalypts every 20m to strengthen vegetation cover.
- Wombat burrows: Monitor burrows as they currently pose minimal risk to slope stability.
- Head gully erosion: Consider lining with geotextile and rock to support dam decommissioning.
- Gully erosion: Acacia growth stabilizing the area; further direct erosion control is difficult but remains a closure risk.
- Large erosion gullies: Gullies remain but are stabilizing with Acacia growth; no further erosion control recommended.
- Drop-down structures: Currently stable but require engineered redesign for long-term decommissioning.
- Sediment trap maintenance: Regular desilting now incorporated into routine operations.
- Slope stability: Hydro mulching recommended for vegetative cover and stability.
- Sediment control: Reshape landform to direct water flow to the designated sediment dam.
- Tree guards maintenance: Replace damaged guards, assess tree survivorship, and replant as needed.

The detailed Ecological Assessment was undertaken in November 2024. This Assessment is undertaken every 2 years to determine the status of the rehabilitation areas against the closure completion criteria and to provide advice for improvements. The three-year plan was developed in 2021 to guide the rehabilitation of the quarry site, table 19 shows the three-year plan status. An update to the 3 year rehabilitation implementation plan, designed to provide timings of rehab objectives over the 3 year period will be developed early in 2025. The weed management plan was updated in 2024 to align with the rapid visual assessment and target any new areas of weed infestation.

Table 19: Biodiversity Rehabilitation Management Plan- three-year plan status

Unit	Area	Activity	Due date	Status
1	Habitat Management area	Maintenance- Weed and pest management	Quarterly 2022 Quarterly 2024 Quarterly 2024	Completed, heavy focus on serrated tussock and blackberry Completed, heavy focus on serrated tussock and blackberry
		Ecological Assessment	2022 2024	Completed Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
2	**Peppers Woodlands (proposed biobank site)** This area is no longer a biobank site but now the benchmark for the rehabilitation works at Peppertree	Ecological Assessment	2022 2024	Completed Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
3	**Pit void**	Landform establishment of batters	2022 2024 2024	Ongoing as batters become available Ongoing as batters become available
		Land preparation and revegetation	2022 2024 2024	Not applicable Not applicable
		Maintenance of rehabilitated areas	2022 2024 2024	N/A no rehabilitated areas within the pit void, ongoing as they become available
		Ecological Assessment	2022 2024	Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
4	**Southern overburden emplacement**	Land preparation	2022	Ongoing, some completed throughout 2024, will continue throughout 2024
		Revegetation	2022	Areas available for revegetation have been completed

		Maintenance of rehabilitated areas	2022 2024 2024	Completed, heavy focus on serrated tussock and blackberry and goat removal
		Ecological Assessment	2022 2024	Completed Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
5	**Western Overburden emplacement**	Landform establishment	2022	Ongoing, some completed throughout 2022, will continue throughout 2024
		Land preparation	2022	Ongoing, some completed throughout 2022, will continue throughout 2024
		Revegetation	2024	Ongoing
		Maintenance of rehabilitated areas	2022 2024 2024	Completed, heavy focus on serrated tussock and blackberry
		Ecological Assessment	2022 2024	Completed Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
6	**Eastern Overburden Emplacement**	Land preparation	2022	Completed in 2024
		Revegetation	2022 2024 2024	Area grassed, spot sprayed and overplanted Ongoing
		Maintenance of rehabilitated areas	2022 2024 2024	Completed, heavy focus on serrated tussock and blackberry and goat removal Ongoing
		Ecological Assessment	2022 2024	Completed Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed
7	**Infrastructure footprint**	Maintenance of rehabilitated areas	2022 2024 2024	Completed, heavy focus on serrated tussock and blackberry
8	**Southern Western Overburden Emplacement**	Revegetation	2022 2024 2024	Not yet completed, construction of the overburden continuing
		Maintenance of rehabilitated areas	2022 2024 2024	Completed, heavy focus on serrated tussock and blackberry
		Ecological Assessment	2022 2024	Completed
		Rapid visual Assessment	2022 2024 2024	Completed Completed

9 COMMUNITY

9.1 ENVIRONMENTAL COMPLAINTS MANAGEMENT

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.

The Quarry received 2 complaints, during the current reporting period. This complaint was investigated, and all appropriate actions taken at the time, with details shown in Table 20.

As part of an ongoing noise assessment program that was managed during the reporting period, text notifications have also been received from two residents regarding noise. A real time noise monitor is now in place at one residence. Information received from the residence is correlated with the real time noise measurements, Quarry operations occurring at the time, and the weather conditions, to allow the quarry to establish an operating procedure around the management of the noise. Additional noise monitoring is undertaken at the second residence as deemed necessary.

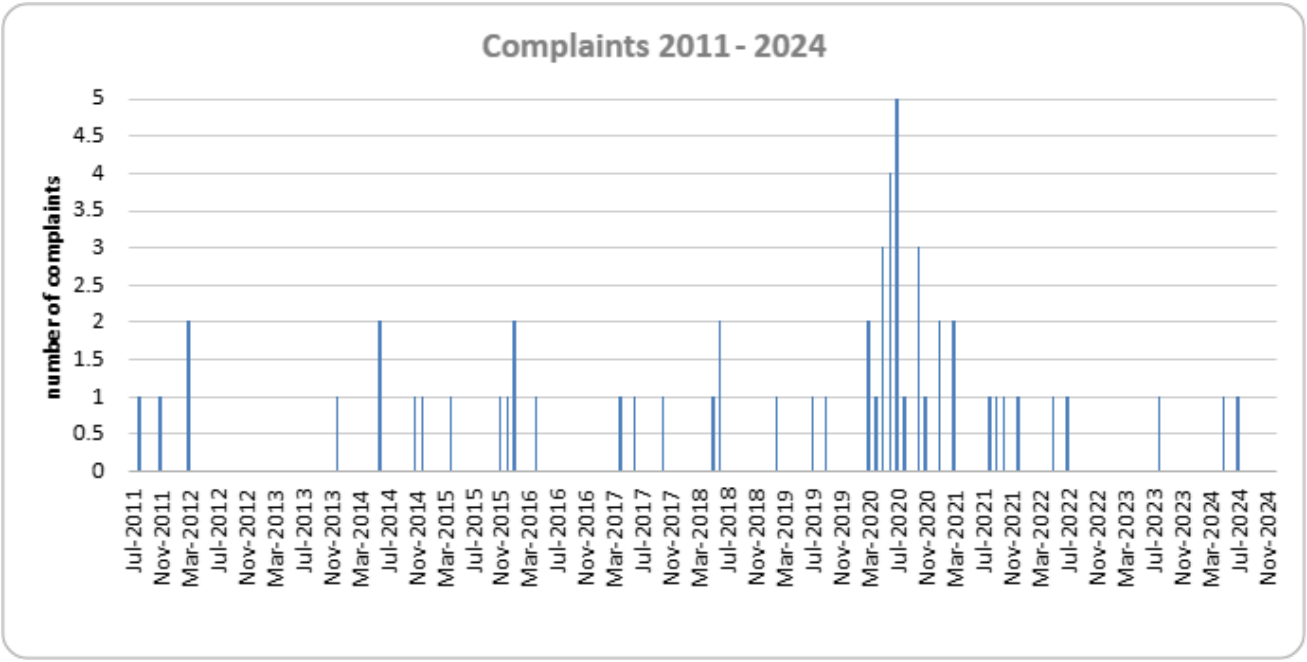
Boral will continue to develop and maintain relationships with the community and ensure their concerns are addressed to an acceptable outcome, wherever possible.

Complaints received since the Quarry commenced production are presented in Figure 3 (2011- 2024).

Table 20: Complaints

Date - 2024	Nature of Concern	Outcome of investigation
26th & 27th May	EPA officers advised of an anonymous dust complaint made to their information line regarding dust emissions at Peppertree on the 26th and 27th of May 2024	EPA advised that a complaint was also received from the Resource Regulator for the same time period. An investigation into operations over that time period had already been undertaken. Water cart was in operation. Truck movements had been stopped.
6th July 2024	A complaint was received from one of the neighbours of Peppertree Quarry regarding noise from train shunting on the morning of Wednesday 3rd, Thursday 4th and Friday 5th July in the early hours of 12.30 to 3am.	No immediate action as complaint was made after the event. However, train times and weather conditions were investigated

Figure 3: Long term trend Complaints (2011 – 2024)



9.2 COMMUNITY CONSULTATION

The Quarry has actively engaged with the local community since the commencement of the 2006 Environmental Assessment for the project. The program has included:

- The establishment of a Community Consultation Committee;
- 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. The CCC is comprised of:

- Two representatives from Peppertree Quarry 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 Quarry 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 three times during the 2024 calendar year – March, July, and November

An Annual CCC report for 2024 has prepared, by the Chair (as per the Community Consultative Guidelines) and issued to the DPHI.

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.

9.4 COMMUNITY NEWSLETTERS

Community Newsletters are produced on a regular basis in order to inform local residents of the Quarry operations and activities as well as detailing Boral's involvement in local community events. These are distributed via the Marulan Messenger" newsletter issued to the local community. These can be found under the communications tab at:

https://www.boral.com.au/locations/peppertree-quarry

The first newsletter was circulated in 2011 and continued to be frequently issued during the reporting period.

9.5 COMMUNITY EVENTS

The Quarry staff are actively engaged with community events in the Marulan and Goulburn area.
Community and stakeholder activities that occurred during the reporting period included:

- Tallong Apple Festival – Financial sponsorship and stall holder;
- Goulburn Mulwaree Council Community Bike ride as part of Bike week
- Support for the printing of the Marulan Messenger local newsletter on a monthly basis
- Printing of the Tallong newsletter
- Marulan Discretionary fund – Meeting and program support;
- Marulan Chamber of Commerce – Meeting and program support;
- Tallong Public School – Presentation Day and financial support in form of book voucher.
- Donation to rural Fire Service flood light program

9.6 BLAST LIAISON

In accordance with the Development Consent, Condition B16 (Part B), landowners and occupiers of residences within 2 kilometres of the Quarry pit are encouraged to register interest in order to be advised of any future blasts at the pit. Two parties are advised by email with one notified by phone.

9.7 ACCESS TO INFORMATION

Boral has a number of websites for each corporate division. Peppertree Quarry has its own site at:

https://www.boral.com.au/locations/peppertree-quarry

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

10 INDEPENDENT AUDIT

In accordance with Project Approval Condition D13 Part D (Schedule 2) an Independent Audit was conducted in December 2024.

A copy of the final audit report and a response to the recommendations will be provided to the Department of Planning, Housing and Infrastructure in 2025.

All site management plans will be reviewed in line with Condition D6, Part D as a result of the audit.

The Next independent audit, as per Condition D13, is planned for mid-2027.

An EPBC audit was undertaken in September 2024 as to the compliance with Mod 5 EPBC conditions of consent. The audit outcomes included compliance with 7 of the 12 compliance conditions, not applicable with 4 of the 12 conditions and non compliant with 1 of the 12 conditions. The non compliance related to the timing of ecosystem/species credit retirement. The EPBC approval conditions were varied on a number of occasions in relation to the timing of the retirement of the credits due to delays in the final Biodiversity Stewardship Agreement for the offset site. DAWE we kept aware of the situation and the reason for the delays. All credit retirement obligations were met shortly after.

In June 2024 the NSW EPA undertook an Environmental Risk Assessment (ERA) of the Peppertree operations. The ERA determined the operation to remain at a low risk.

11 INCIDENTS & 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 V15 in November 2024 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

One notification was provided to the EPA during the reporting period in regard to Peppertree Quarry operations. This notification related to the sediment dam discharge during prolonged heavy rainfall as discussed in section 7.1

No Regulatory notifications have been received from either the EPA or DPE.

12 ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

The activities proposed to be undertaken during the 2025 AR reporting period are presented in Table 21. 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 21: Proposed Activities in 2025 AR Period

Proposed Activities in 2025	Objectives
Undertake progressive Overburden stabilization and rehabilitation and implement recommendations of the 2024 Rapid Visual Assessment and Ecological assessment	• Minimise erosion and sediment runoff • Move towards achieving biodiversity management plan goals of establishing vegetation corridors
Review and/or prepare management plans - NBMP, AQMP, BRMP, WMP, EMS, BFMP as per modification 7 approval requirements following approval of AEMR and independent audit recommendations	• Document management protocols for quarry operations
Undertake annual Rehabilitation Rapid Visual Assessment (November 2025)	• Move towards achieving biodiversity management plan goals of establishing vegetation corridors
Undertake audit of the surface water management system at the Southern Overburden emplacement once system is installed	• Surface water management
Implement Stakeholder Engagement plan for 2025	• Ongoing community engagement
Pit expansion to the East and commence south-western overburden as per Modification 5	• Ongoing operations
Investigate relocation of air monitoring sampling locations to boundary locations	• Air quality management
Undertake review of frequency of noise monitoring.	• Noise management
Implement recommendations of audit	• Assess compliance with conditions of consent
Undertake and develop future display of the scar trees	• Preservation of Aboriginal Cultural Heritage
Return Aboriginal Artefacts to country not required for education purposes as determined by the AHMC.	• Preservation of Aboriginal Cultural Heritage

APPENDIX 1: ANNUAL RETURN FOR EXTRACTIVE MATERIALS – FINANCIAL YEAR 2024

Extractive Materials Return 2023-24

Form S1 – 1 July 2023 to 30 June 2024

NSW GOVERNMENT | Regional NSW

Please complete the following information to assist in identifying the location of the Quarry

Quarry ID	
RIMS ID	400960
Operator Name	BORAL RESOURCES (NSW) PTY LTD
Operator Address	PO BOX 6041 NORTH RYDE NSW 2113
Operator Email	jon-paul.amodio@boral.com.au
Operator Phone Number	
Quarry Name	PEPPERTREE QUARRY
Quarry Address	MARULAN SOUTH RD, MARULAN NSW 2579
Mining Lease(s) – if any	
Leaseholder(s) Name	
Leaseholder Email	
Leaseholder Phone Number	
Licence or Lease Number – if any (from Crown Lands or other Government Department)	
Licensee Name	Boral Resources (NSW) Pty Ltd
Licensee Email	
Licensee Phone Number	
Deposited Plan and Lot Number of Quarry	
Land Owner	
Nearest Town to Quarry	Marulan
Local Council Name	Goulburn Mulwaree Council
Typical Geology	

For inquiries or to submit completed or nil returns please email: mineral.royalty@regional.new.gov.au

If no work was done during the year, a **NIL** return must be provided.

If completion of the return is unavoidably delayed, an application for extension of time should be requested **before** the due date.

Employment

Include PERSONS in and around the mining establishment (pit or quarry) on quarrying operations, in TRANSPORT, in ADMINISTRATION and PRODUCER-CONSUMERS'S employees, who are engaged in manufacturing (eg of bricks). Head office staff should be excluded (estimate if necessary). Employees on long term service leave or otherwise temporarily absent should be included, but persons on permanent compensation should be omitted.

EMPLOYMENT during the LAST PAY PERIOD of JUNE 2024 All personnel employed at this site including working managers, partner's managers, and contractors.	Employed at site:

The return should relate to the **above quarrying establishment** and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry. A return is required even if the operations are solely of a developmental nature and whether the area being worked is held under a mining title or otherwise.

Submission of this form by email constitutes a declaration by the Leaseholder (if any) Licensee (if any) or Operator that the information contained in this return is correct, to the best of their knowledge, and that there are no blank spaces left where figures should have been inserted.

Regional NSW | 1

Extractive Materials Return 2023-24

Form S1 – 1 July 2023 to 30 June 2024

NSW GOVERNMENT | Regional NSW

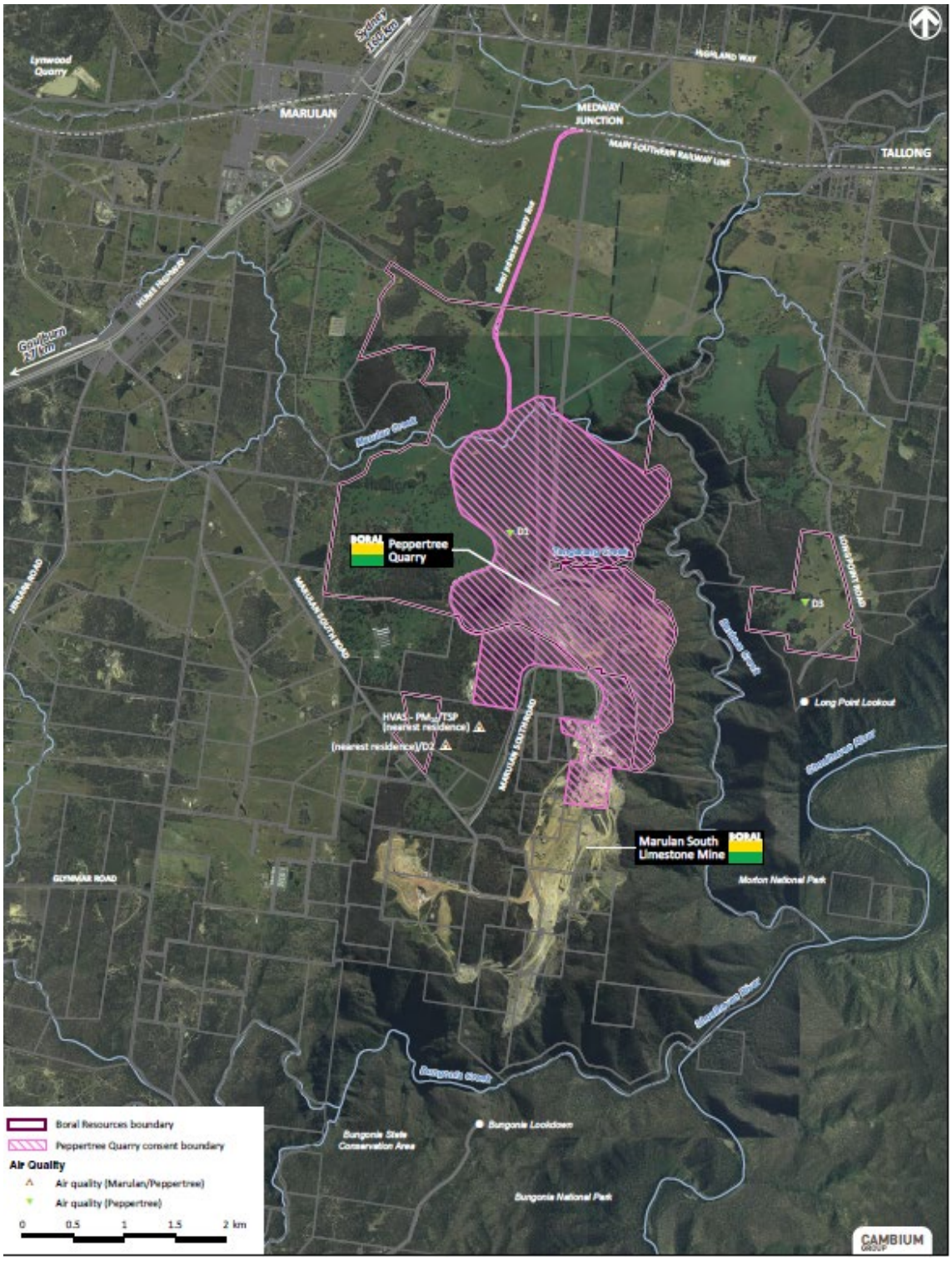
Sales During 2023-2024

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
Virgin Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		1,723,880
Under 5mm		
Natural Sand		
Manufactured Sand		1,241,008
Prepared Road Base & Sub Base		47,506
Other Unprocessed Materials		
Recycled Materials		
Crushed Coarse Aggregates		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
River Gravel		
Over 30mm		
5mm to 30mm		
Under 5mm		
Construction Sand	Excluding Industrial	
Industrial Sand		
Foundry, Moulding		
Glass		
Other (Specify)		
Dimension Stone	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
Decorative Aggregate	Including Terrazzo	
Loam	Soil for Topdressing, Garden soil, Horticultural purposes)	
TOTAL SITE PRODUCTION		3,012,374
Gross Value ($) of all Sales		$115,783,473
Type of Material		
Number of Full-Time Equivalent (FTE) Employees	**Employees = 46**	**Contractors**

APPENDIX 2 AIR QUALITY MONITORING INFORMATION

Air monitoring locations



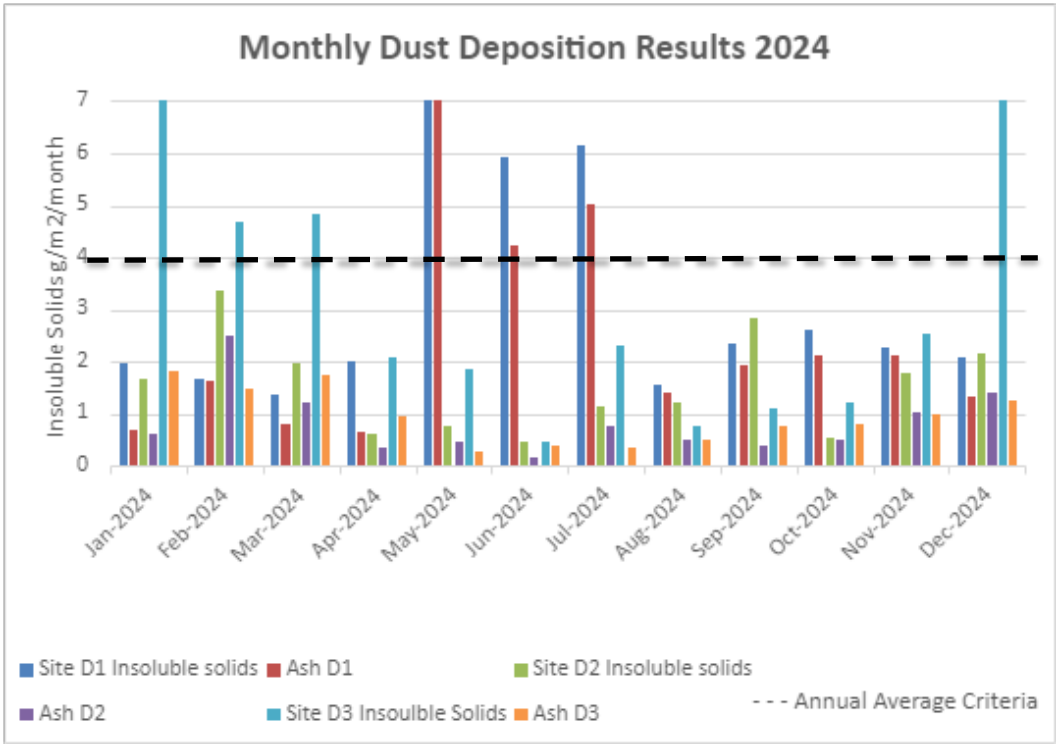
Dust Deposition Results

Sample Identification		Monthly Dust Deposition (Insoluble Solids g/m2/month)												Annual Average Criteria: (4 g/m²/m)
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
D1	Insoluble Solids	1.95	1.66	1.38	1.99	19.13	5.93	6.15	1.56	2.34	2.61	2.25	2.08	**4.09**
	Ash Content	0.7	1.62	0.81	0.63	11.01	4.24	5.02	1.4	1.93	2.11	2.1	1.33	**2.74**
D2	Insoluble Solids	1.66	3.37	1.95	0.60	0.76	0.47	1.12	1.21	2.84	0.53	1.76	2.14	**1.53**
	Ash Content	0.59	2.51	1.23	0.34	0.45	0.14	0.76	0.49	0.40	0.48	1.01	1.41	**0.82**
D3	Insoluble Solids	8.93	4.69	4.84	2.06	1.86	0.46	2.3	0.76	1.11	1.21	2.52	10.41	**3.43**
	Ash Content	1.8	1.49	1.75	0.96	0.25	0.38	0.36	0.5	0.75	0.78	0.99	1.24	**0.94**

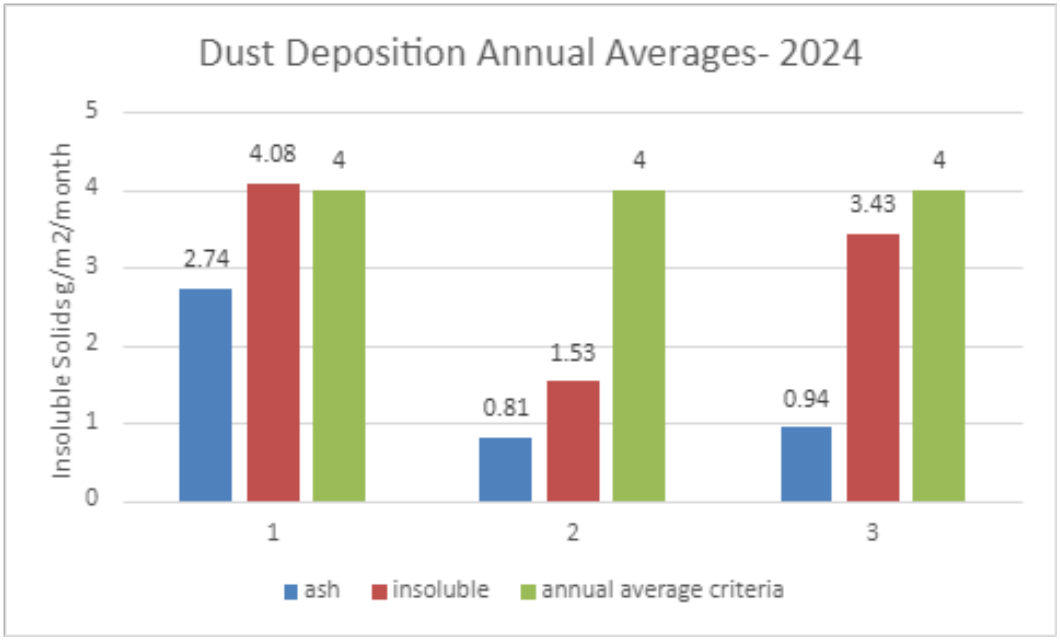
Interpolated deposited dust levels - Todoroski Air Sciences

Sample Identification		Monthly Dust Deposition (Insoluble Solids g/m2/month)											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
D1	Insoluble Solids annual average (at the gauge)	2.16	2.14	2.04	2.06	3.45	3.76	4.15	4.16	4.00	4.14	4.06	4.09
	Insoluble Solids annual average (at the boundary)	0.5	0.5	0.5	0.5	0.8	0.9	1.0	1.0	0.9	1.0	0.9	0.9
D2	Insoluble Solids annual average (at the gauge)	1.47	1.64	1.70	1.66	1.66	1.62	1.63	1.67	1.79	1.69	1.67	1.53
	Insoluble Solids annual average (at the boundary)	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.0
D3	Insoluble Solids annual average (at the gauge)	2.84	3.15	3.24	3.28	3.35	3.26	3.26	3.27	3.27	3.24	2.97	3.43
	Insoluble Solids annual average (at the boundary)	1.8	2.0	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	1.9	2.2

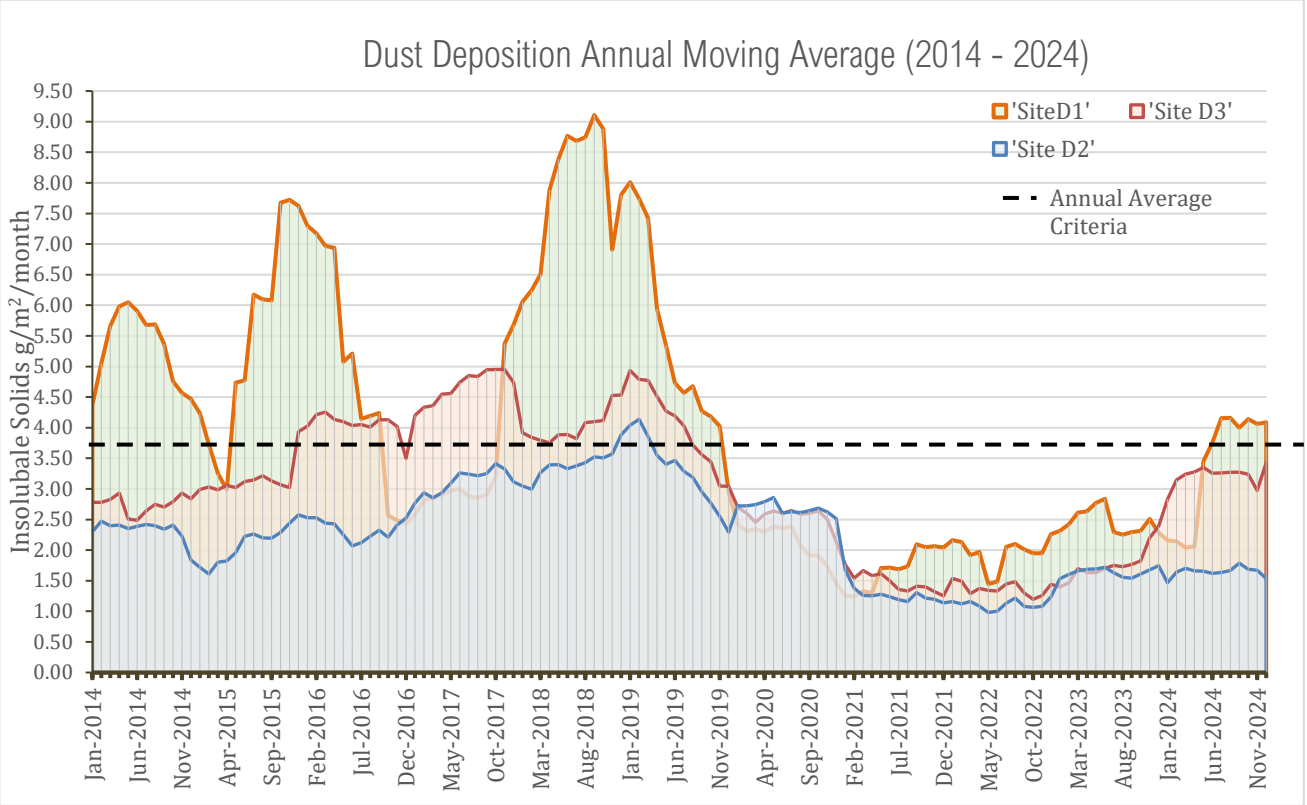
Dust Deposition Results – Annual Averages 2024



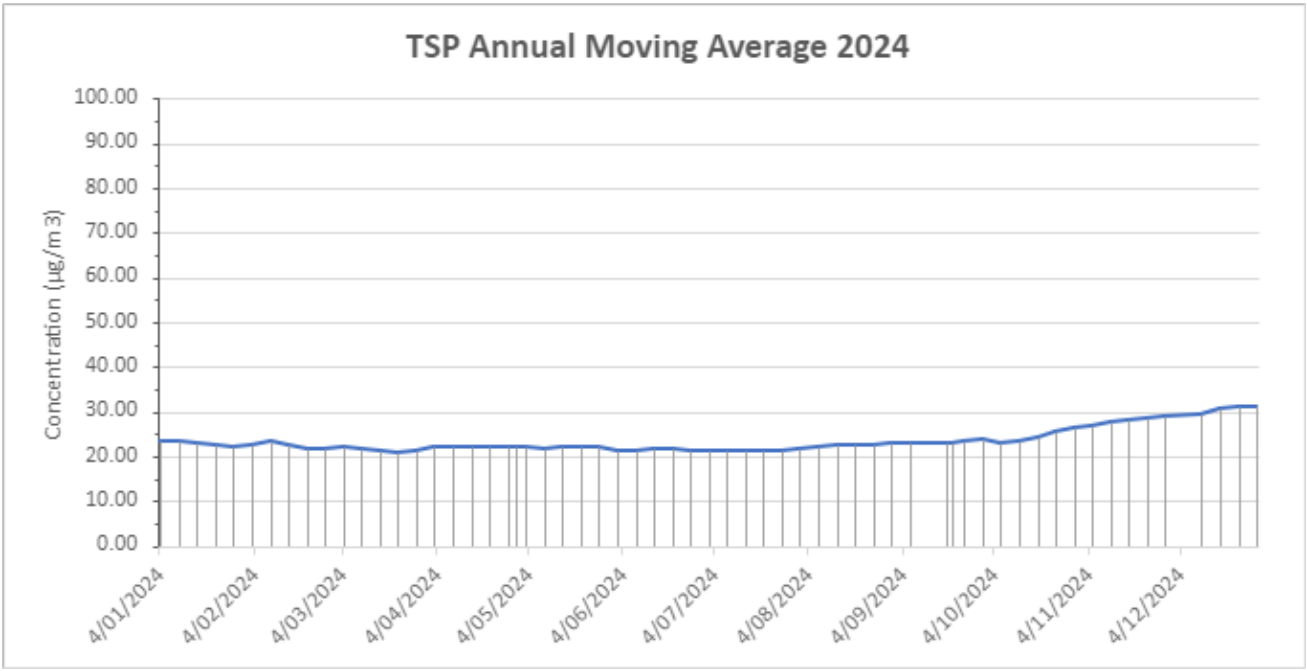
Dust Deposition Results – Annual Averages – Total 2024



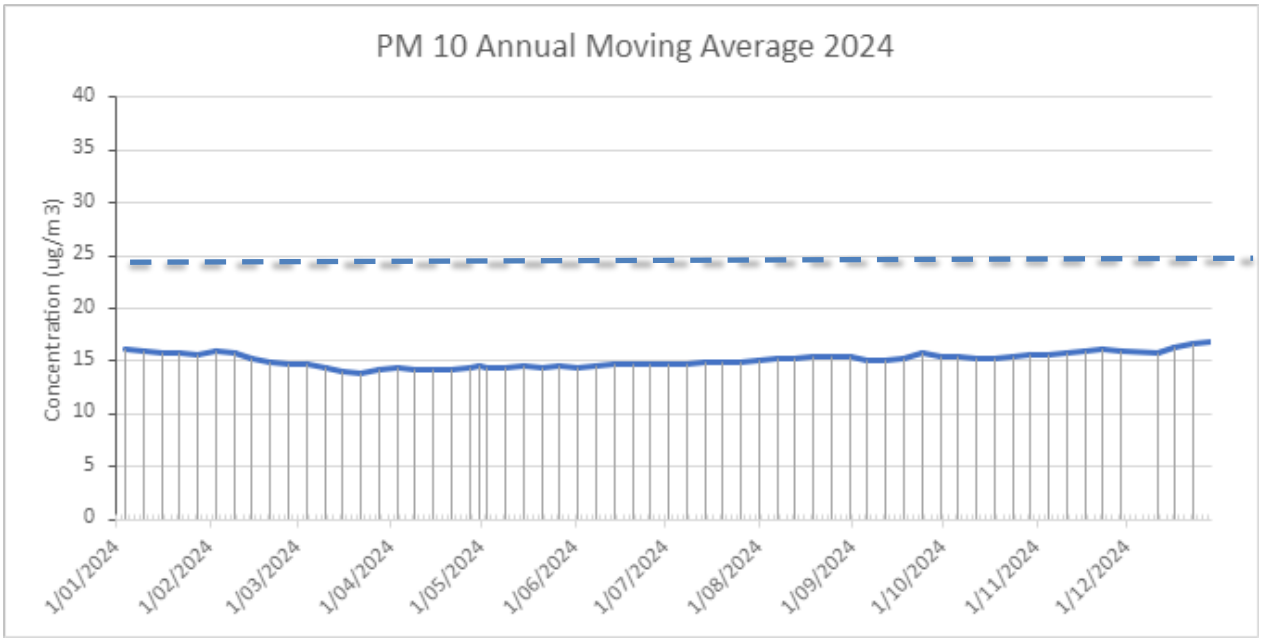
Dust Deposition Results – Annual Averages trend 2014 to 2024



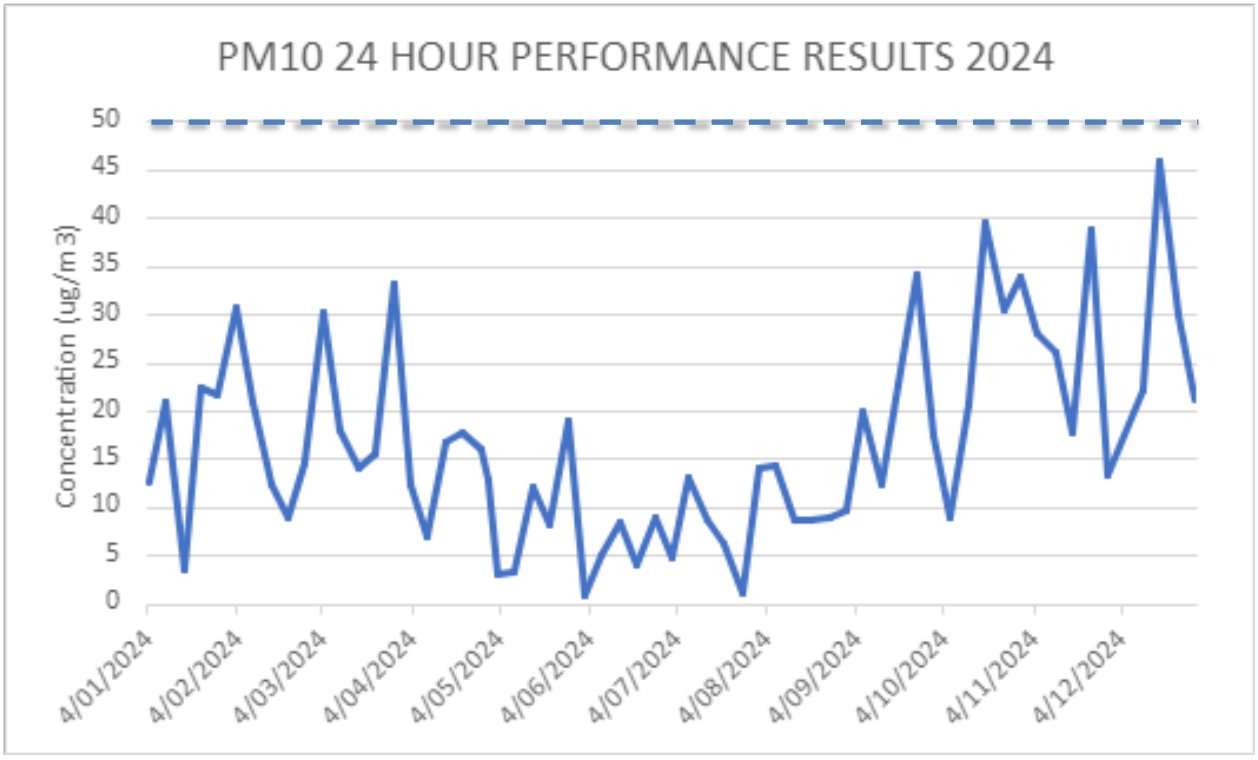
TSP - Annual Average results – 2024



PM_{10} annual average results 2024



PM10 24- hour performance results – 2024



Interpolated HVAS dust levels - Todoroski Air Sciences

Dates	PM10 (Measured)	PM10 (Estimated contribution to receptor)
4/01/2024	12.6	5.5
10/01/2024	20.92	5.4
16/01/2024	3.67	1.8
22/01/2024	22.33	11.6
28/01/2024	21.63	10.7
3/02/2024	30.84	14.5
9/02/2024	21.05	11.0
15/02/2024	12.5	6.5
21/02/2024	8.99	4.7
27/02/2024	14.54	7.6
4/03/2024	30.23	15.7
10/03/2024	18.12	5.6
16/03/2024	14.09	7.3
22/03/2024	15.63	5.6
28/03/2024	33.12	17.3
3/04/2024	12.48	3.5
9/04/2024	7.06	2.3
15/04/2024	16.86	0.0
21/04/2024	17.68	6.9
27/04/2024	16.06	6.8
30/04/2024	12.95	6.5
3/05/2024	3.00	1.6
9/05/2024	3.28	1.7
15/05/2024	12.27	1.3
21/05/2024	8.14	3.0
27/05/2024	19.01	3.6
2/06/2024	0.96	0.3
8/06/2024	5.06	0.0
14/06/2024	8.56	2.5
20/06/2024	4.2	0.4

Dates	PM10 (Measured)	PM10 (Estimated contribution to receptor)
26/06/2024	8.95	0.0
2/07/2024	4.78	2.5
8/07/2024	13.19	6.5
14/07/2024	8.76	0.0
20/07/2024	6.18	0.0
26/07/2024	1.17	- (weather data unavailable)
1/08/2024	14.08	7.0
7/08/2024	14.47	3.6
13/08/2024	8.65	2.9
19/08/2024	8.76	3.5
25/08/2024	8.9	0.3
31/08/2024	9.82	0.0
6/09/2024	19.99	0.0
12/09/2024	12.45	5.4
18/09/2024	22.68	0.0
24/09/2024	34.17	4.9
30/09/2024	17.6	5.6
6/10/2024	8.97	0.0
12/10/2024	20.62	10.7
18/10/2024	39.54	0.0
24/10/2024	30.41	9.0
30/10/2024	33.9	3.1
5/11/2024	27.98	14.6
11/11/2024	26.24	13.7
17/11/2024	17.75	0.8
23/11/2024	38.85	3.2
29/11/2024	13.48	7.0
11/12/2024	22.26	6.3
17/12/2024	45.89	8.0
23/12/2024	29.96	0.0
29/12/2024	21.19	5.1

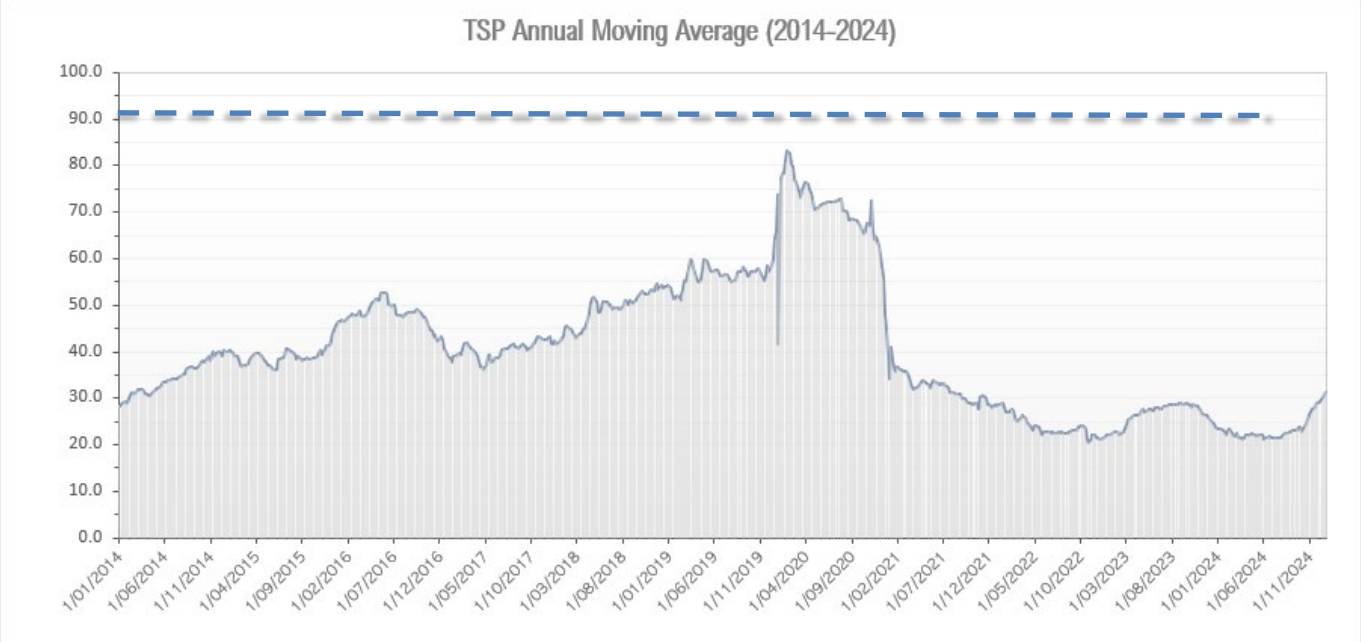
Interpolated HVAS dust levels - Todoroski Air Sciences

Dates	PM2.5 (Measured)	PM2.5 (Estimated contribution to receptor)
4/01/2024	14.2	2.6
10/01/2024	22.56	5.9
16/01/2024	10.13	5.1
22/01/2024	16.89	8.8
28/01/2024	15.90	7.9
3/02/2024	19.54	9.3
9/02/2024	12.94	6.7
15/02/2024	5.21	2.7
21/02/2024	4.61	2.4
27/02/2024	5.97	3.1
4/03/2024	17.20	9.0
10/03/2024	11.28	3.5
16/03/2024	9.28	4.8
22/03/2024	12.82	4.6
28/03/2024	11.70	6.1
3/04/2024	14.52	4.1
9/04/2024	5.65	1.8
15/04/2024	12.91	0.0
21/04/2024	21.98	8.6
27/04/2024	10.84	4.6
30/04/2024	5.21	2.6
3/05/2024	1.58	0.8
9/05/2024	0.62	0.3
15/05/2024	3.98	0.4
21/05/2024	3.06	1.1
27/05/2024	14.96	2.9
2/06/2024	1.30	0.5
8/06/2024	6.19	0.0
14/06/2024	5.23	1.6
20/06/2024	7.88	0.8

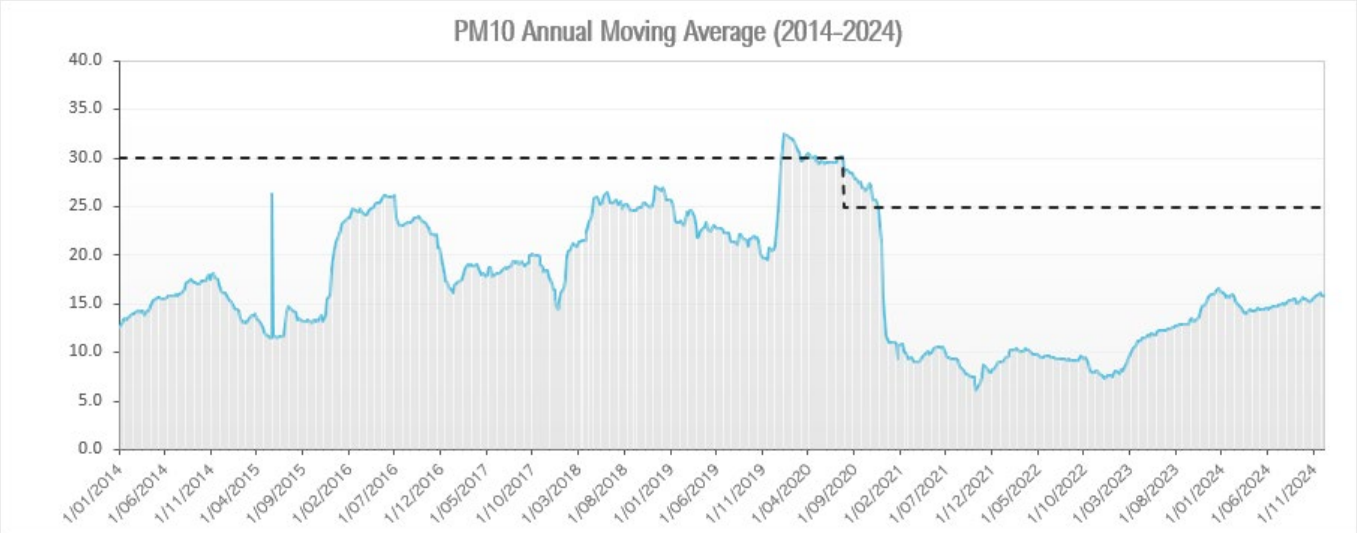
Dates	PM2.5 (Measured)	PM2.5 (Estimated contribution to receptor)
26/06/2024	5.60	0.0
2/07/2024	2.29	0.5
8/07/2024	8.05	0.0
14/07/2024	5.82	1.6
20/07/2024	8.71	0.8
26/07/2024	5.68	0.0
1/08/2024	7.39	3.7
7/08/2024	12.31	3.1
13/08/2024	5.36	1.8
19/08/2024	0.55	0.2
25/08/2024	6.25	0.2
31/08/2024	8.20	0.0
6/09/2024	23.73	0.0
12/09/2024	3.88	1.7
18/09/2024	17.21	0.0
24/09/2024	24.98	3.6
30/09/2024	12.18	3.9
6/10/2024	6.52	0.0
12/10/2024	10.01	5.2
18/10/2024	21.58	0.0
24/10/2024	16.14	4.8
30/10/2024	22.29	2.0
5/11/2024	10.67	5.6
11/11/2024	10.06	5.2
17/11/2024	14.46	0.6
23/11/2024	26.08	2.1
29/11/2024	7.48	3.9
11/12/2024	13.24	3.7
17/12/2024	84.33	N/A[a]
23/12/2024	26.66	0.0
29/12/2024	15.87	3.8

[a] Discussed in section 6.3.2.1

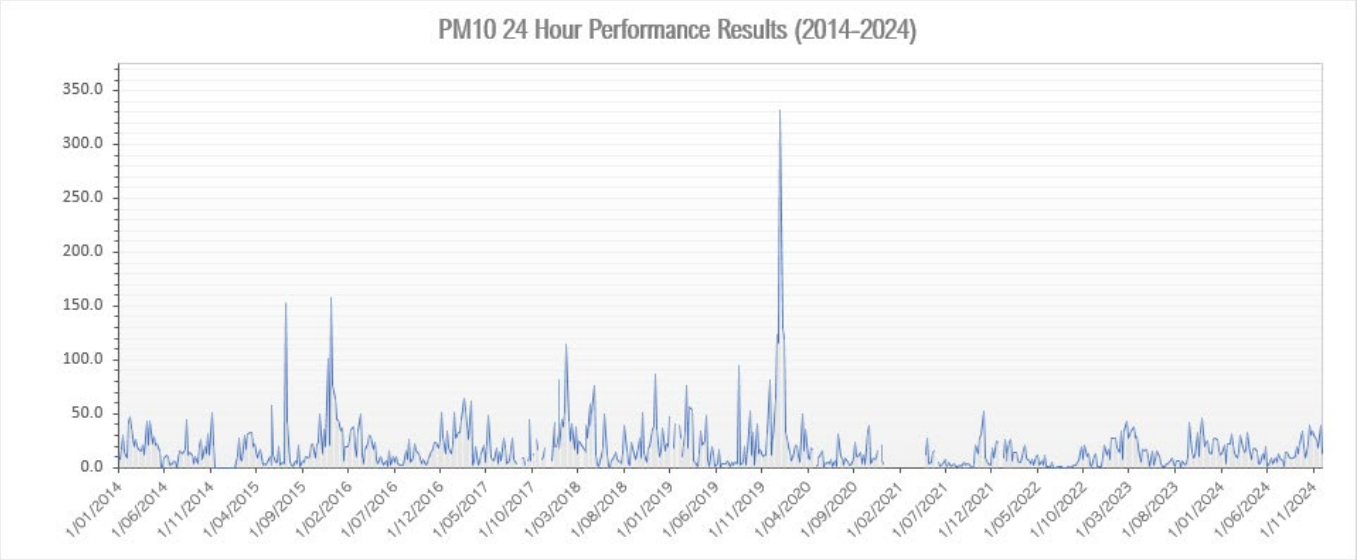
Long Term TSP Trend – 2014 to 2024



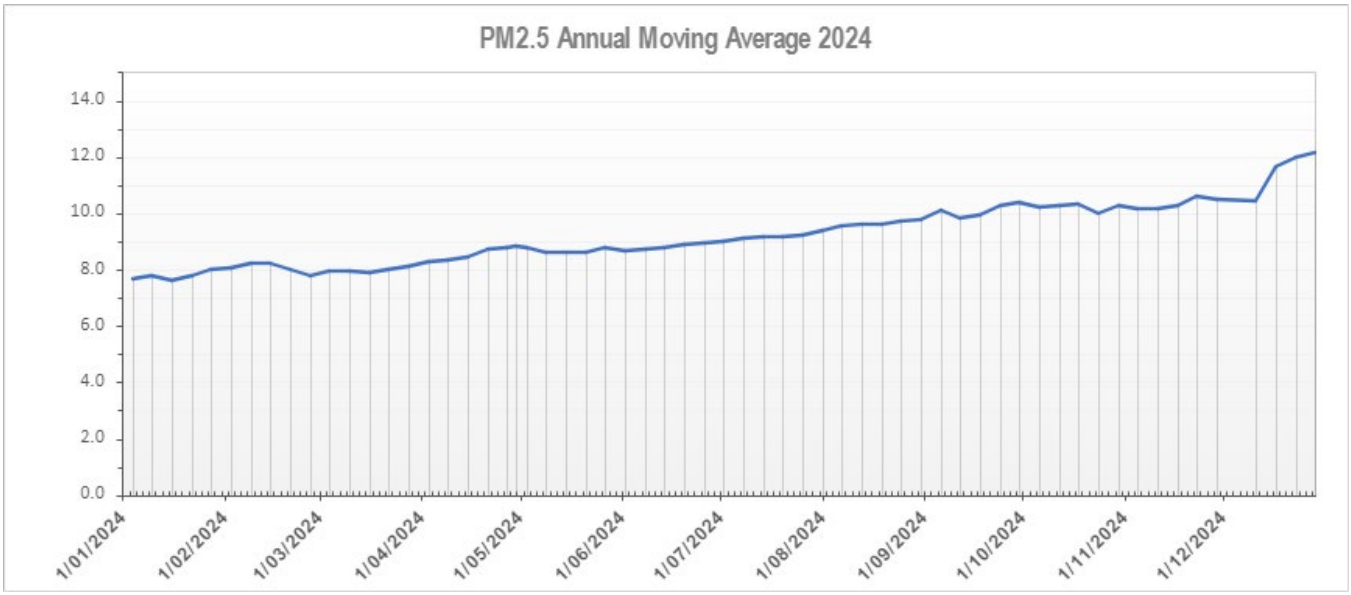
Long Term PM10 Trend – 2014 to 2024



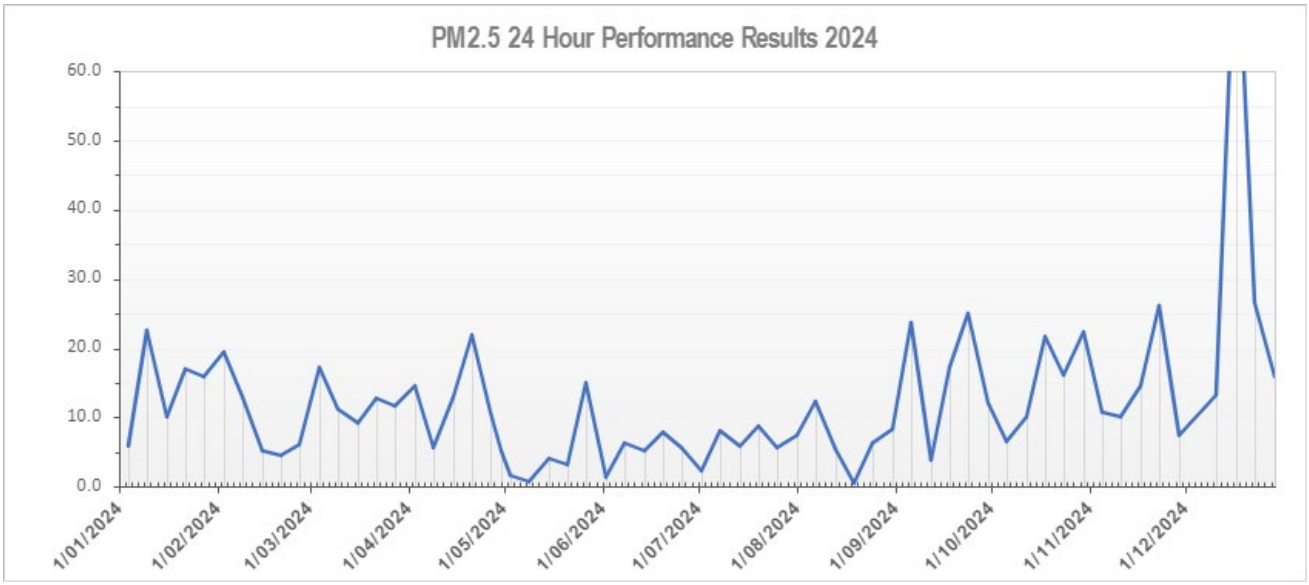
PM10 24 hour performance results - 2014 to 2024



PM2.5 annual average results 2024

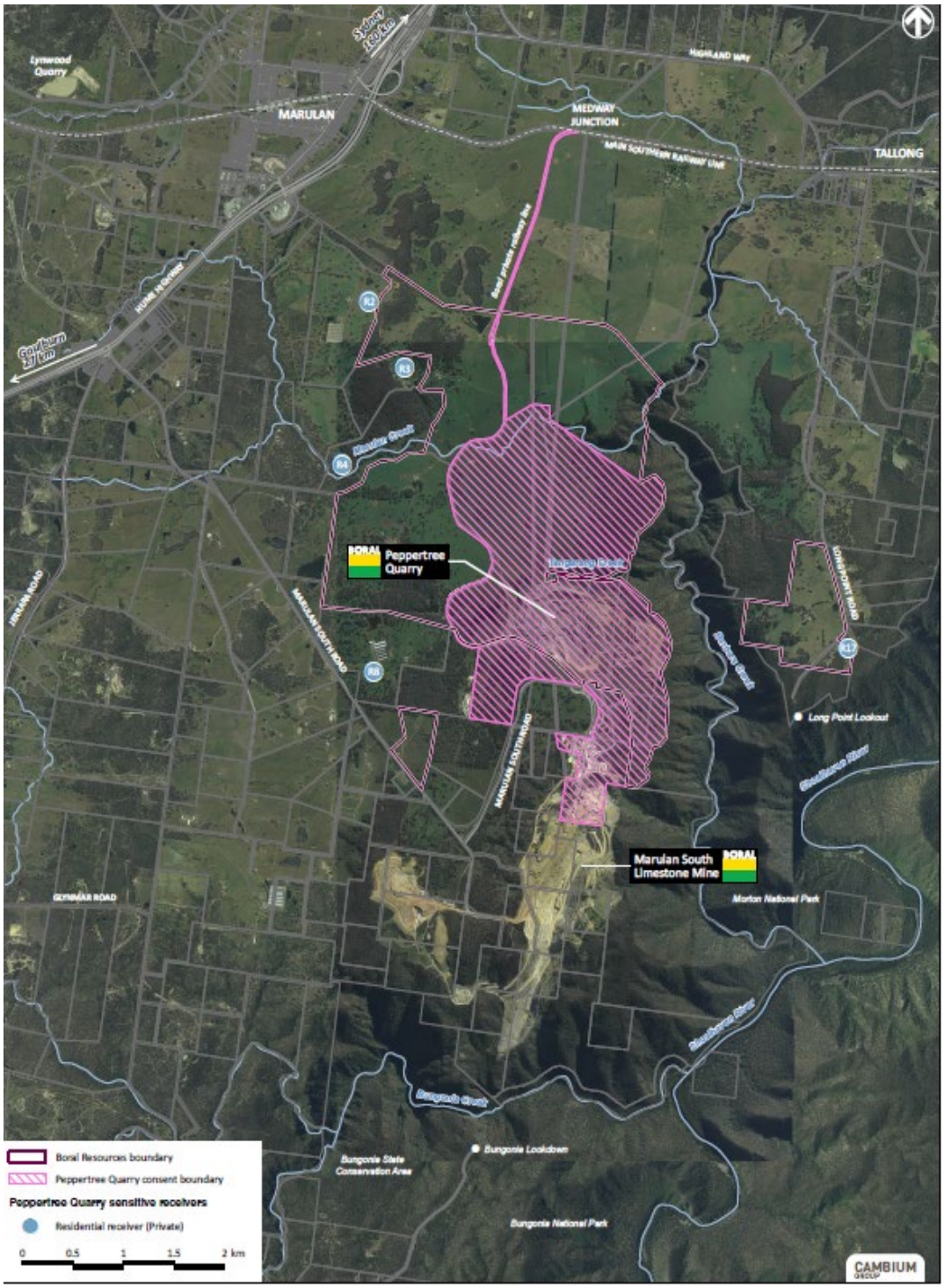


PM2.5 24 hour performance results – 2024



APPENDIX 3 NOISE MONITORING

Residential receiver locations

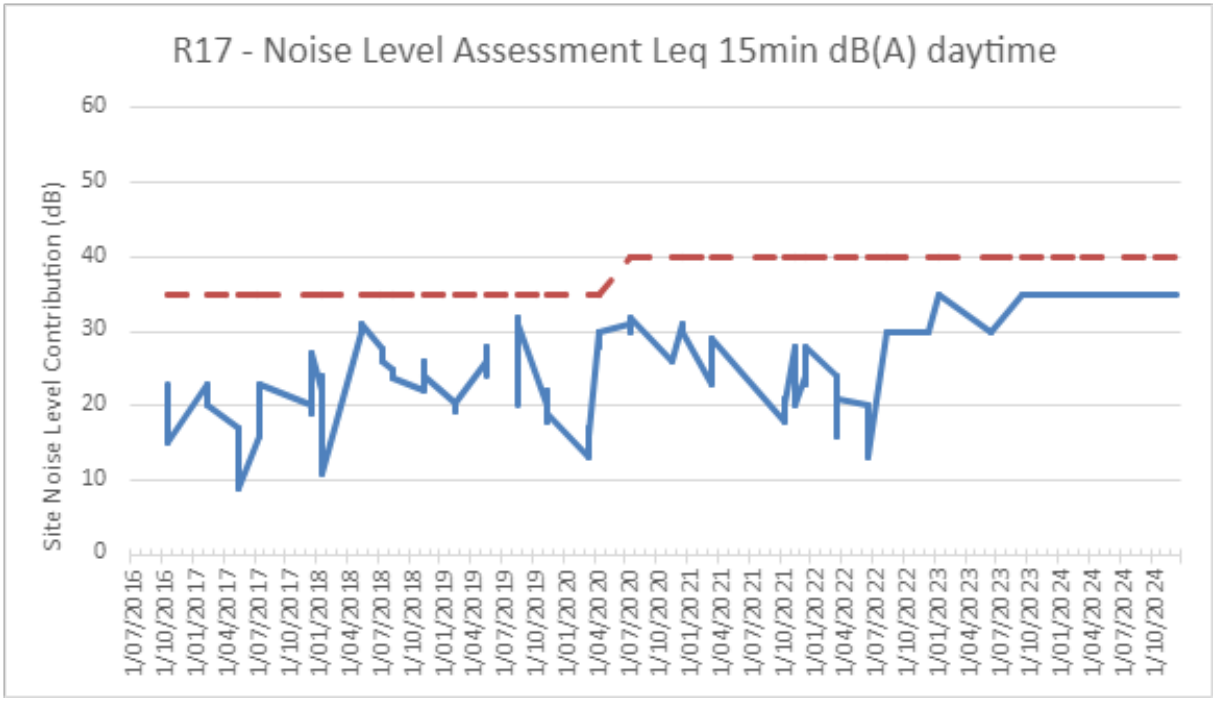


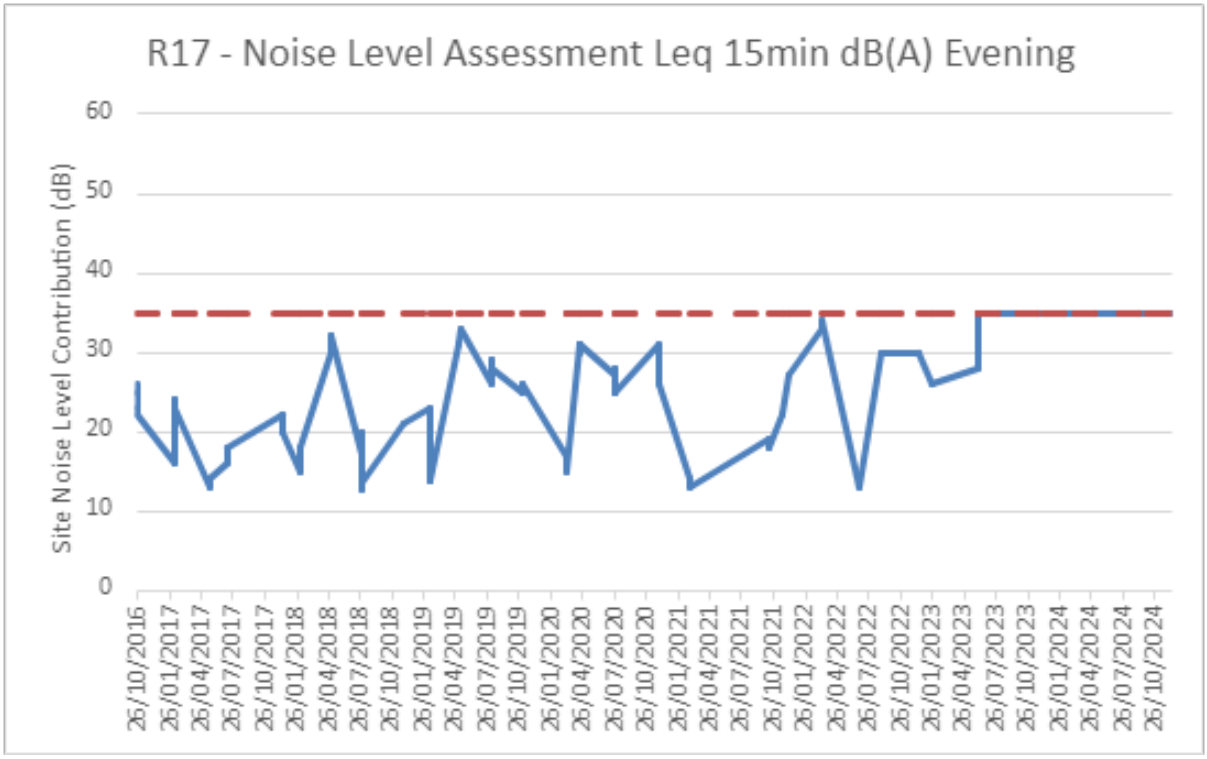
Noise Assessment Results (LAeq (15min))

Residential Receiver	Assessment Dates (2024)	Noise Level Assessment (LAeq (15min))		
		Compliance Criteria	Measured Noise Levels dB(A)	Compliance with Criteria
Receiver R3	March	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	July	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
	October	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	December	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
Receiver R2	March	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	July	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
	October	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	December	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
Receiver R8	March	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	July	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
	October	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	December	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
Receiver R4	March	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	July	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
	October	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	December	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
Receiver R17	March	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	July	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes
	October	Day: 40 Evening/Night: 35	<35/<35 <35	Yes Yes
	December	Day: 40 Evening/Night: 35	<35 <35/<35	Yes Yes

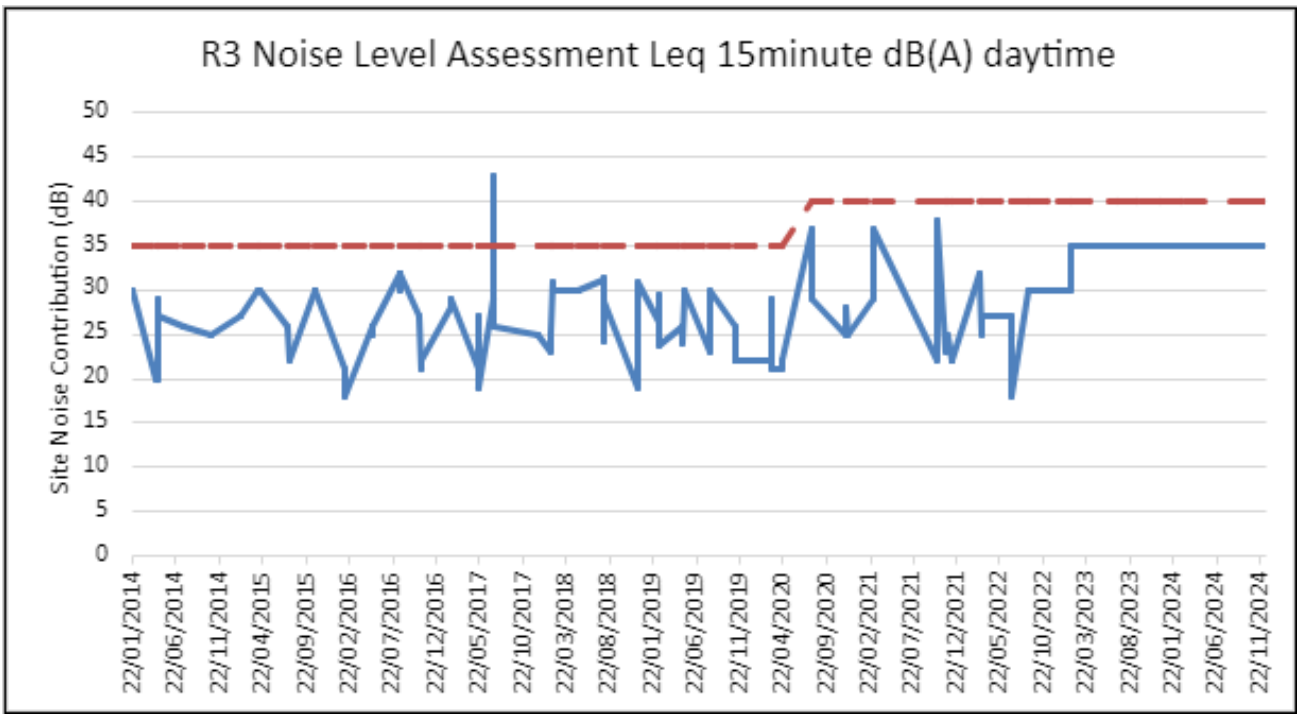
Note: some results in the below graphs may appear on the criteria limit. Noise results are now given as a less than number (e.g. <35) rather than an exact noise level.

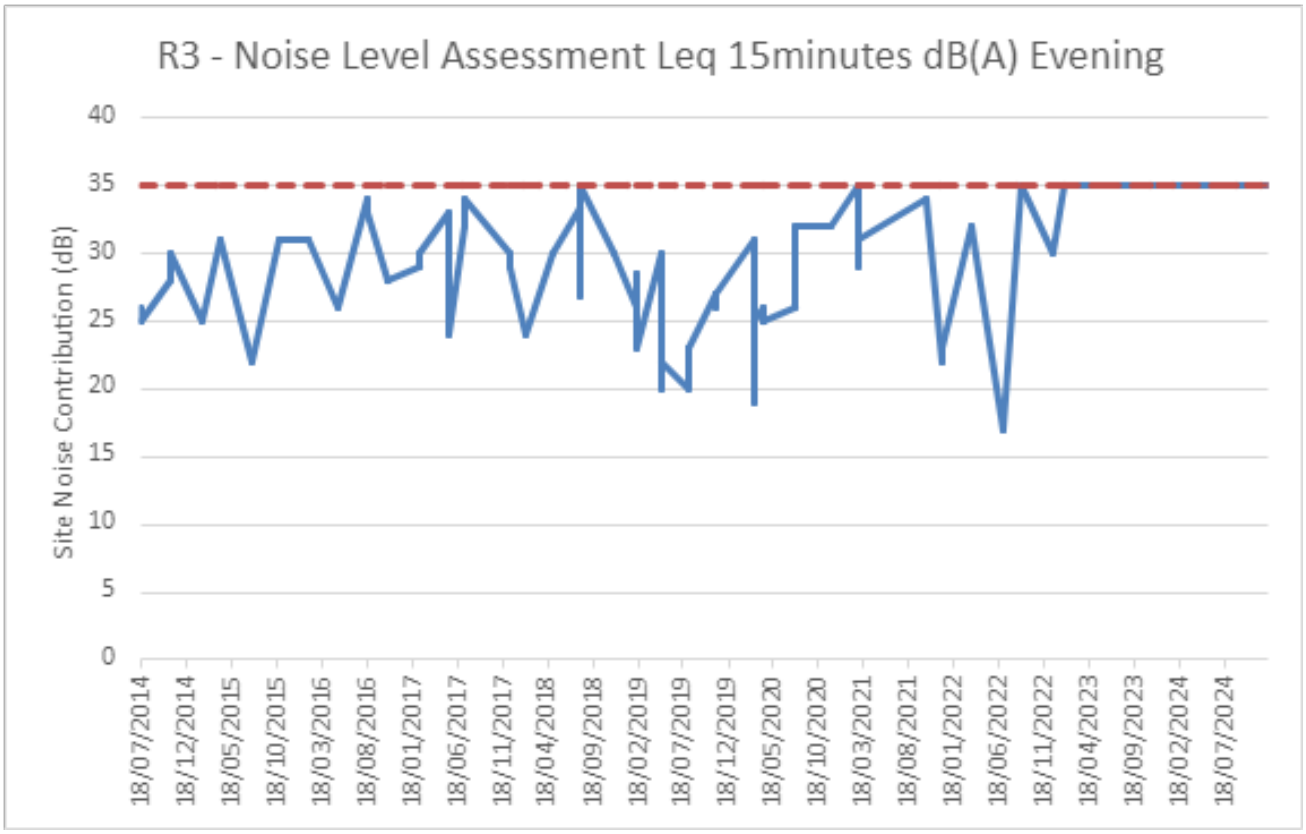
R 17 Off-Site Noise Level Trends (LAeq 15) 2016 – 2024



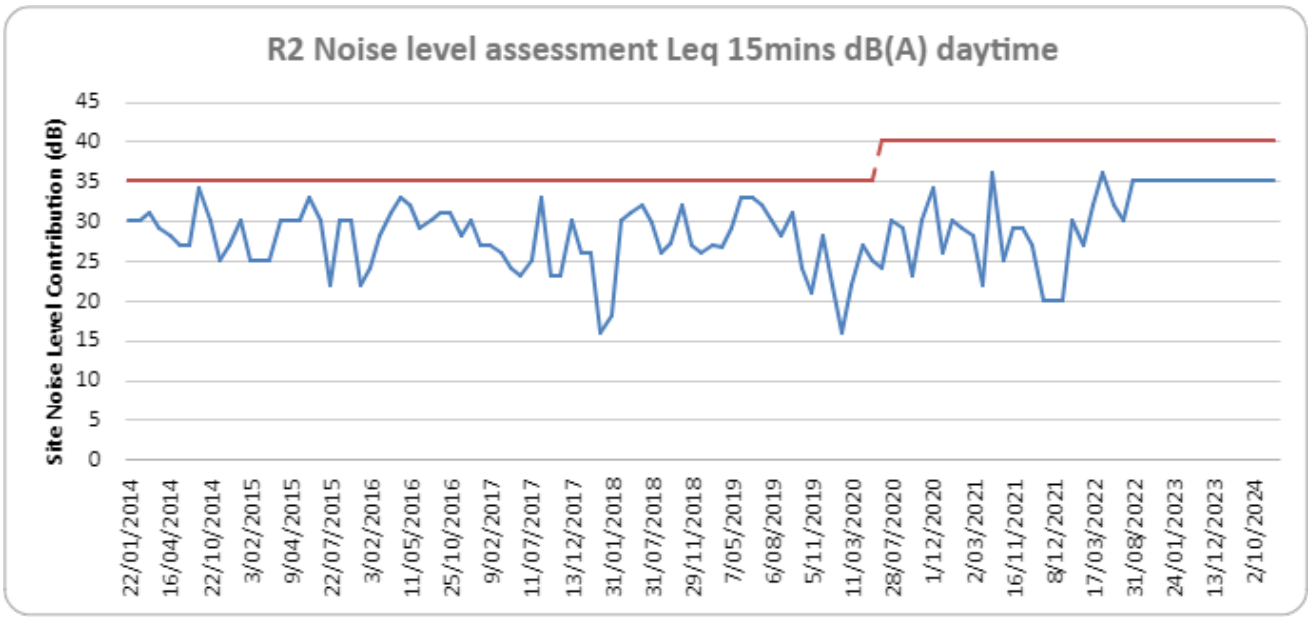


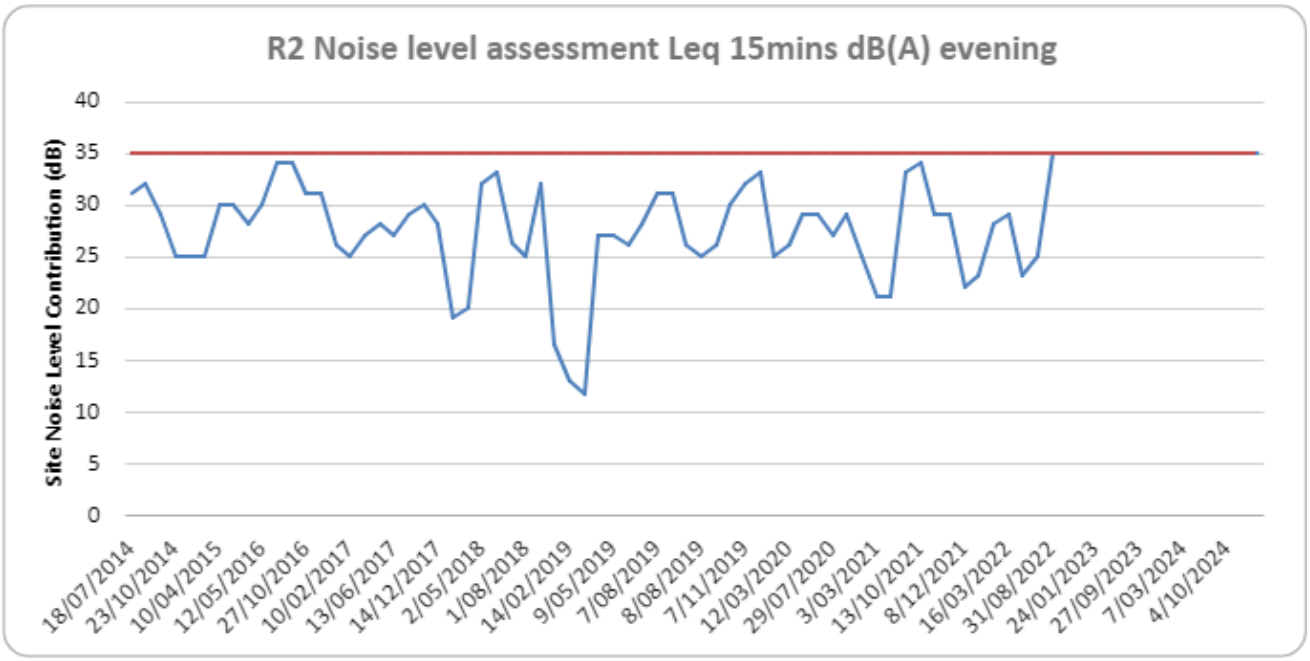
R 3 Off-Site Noise Level Trends (LAeq 15) 2014 – 2024



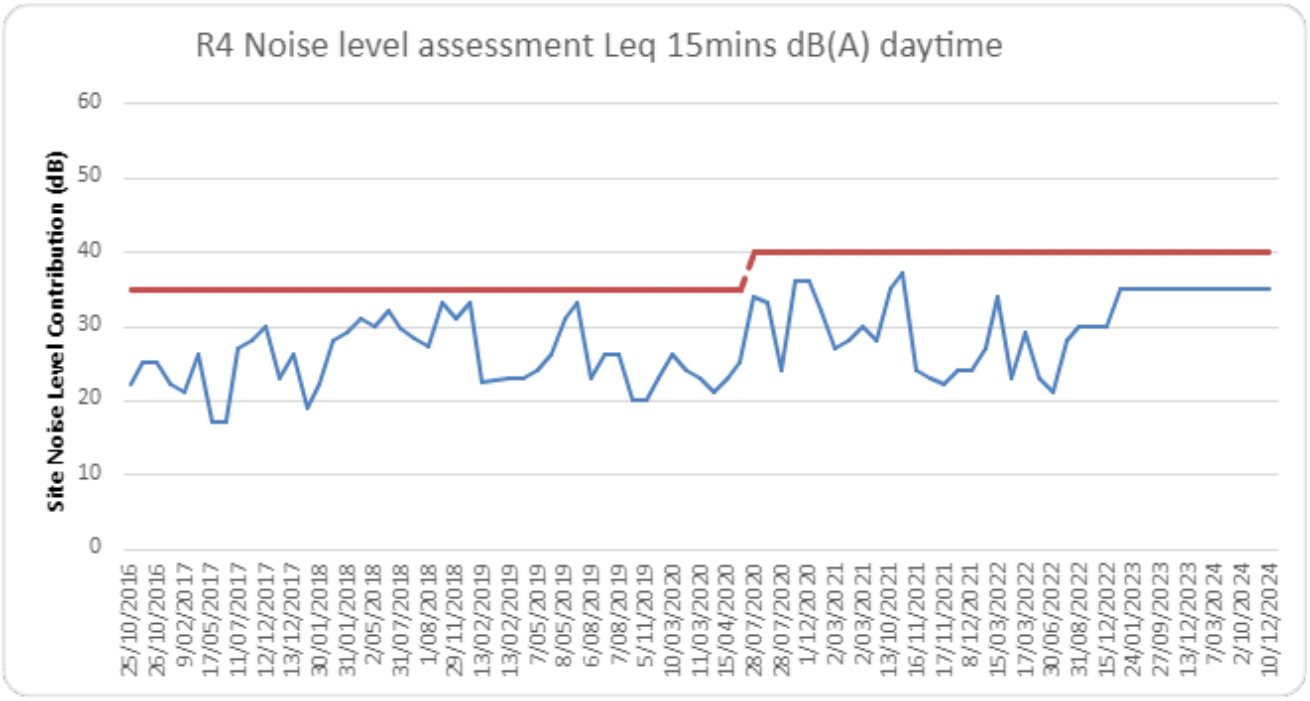


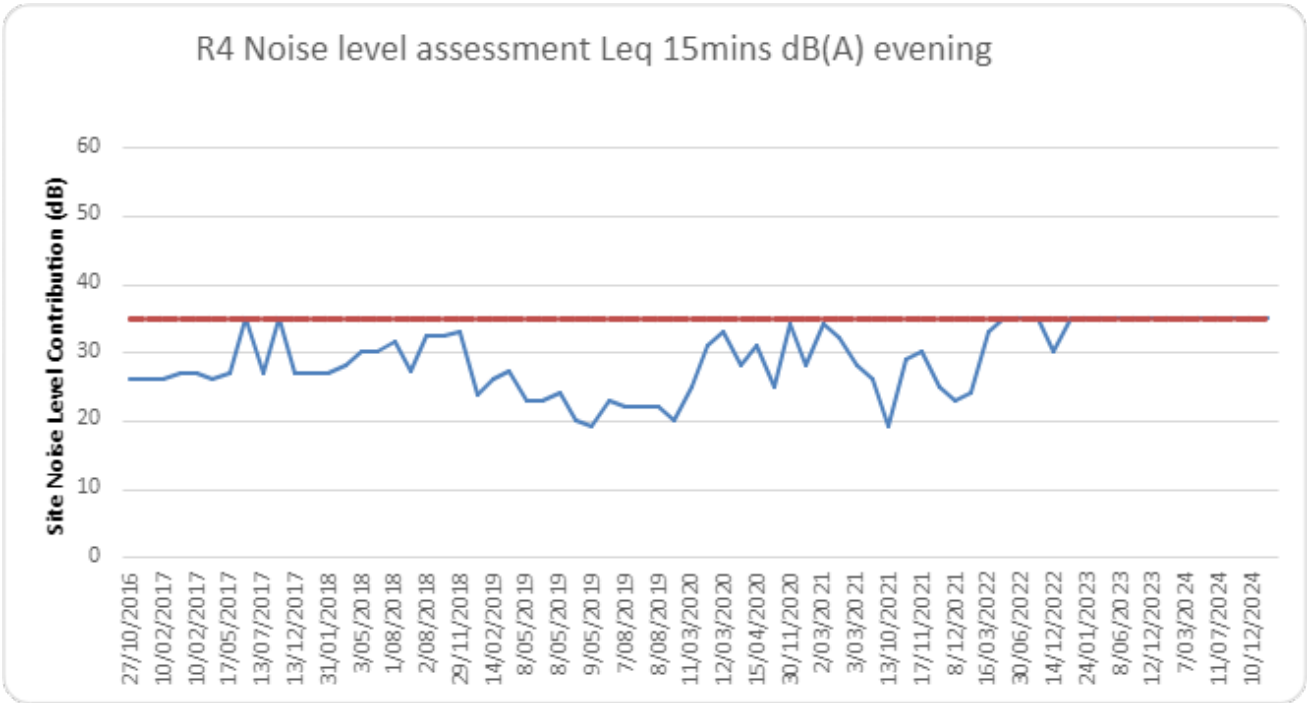
R2 Off-Site Noise Level Trends (LAeq 15) 2014 – 2024



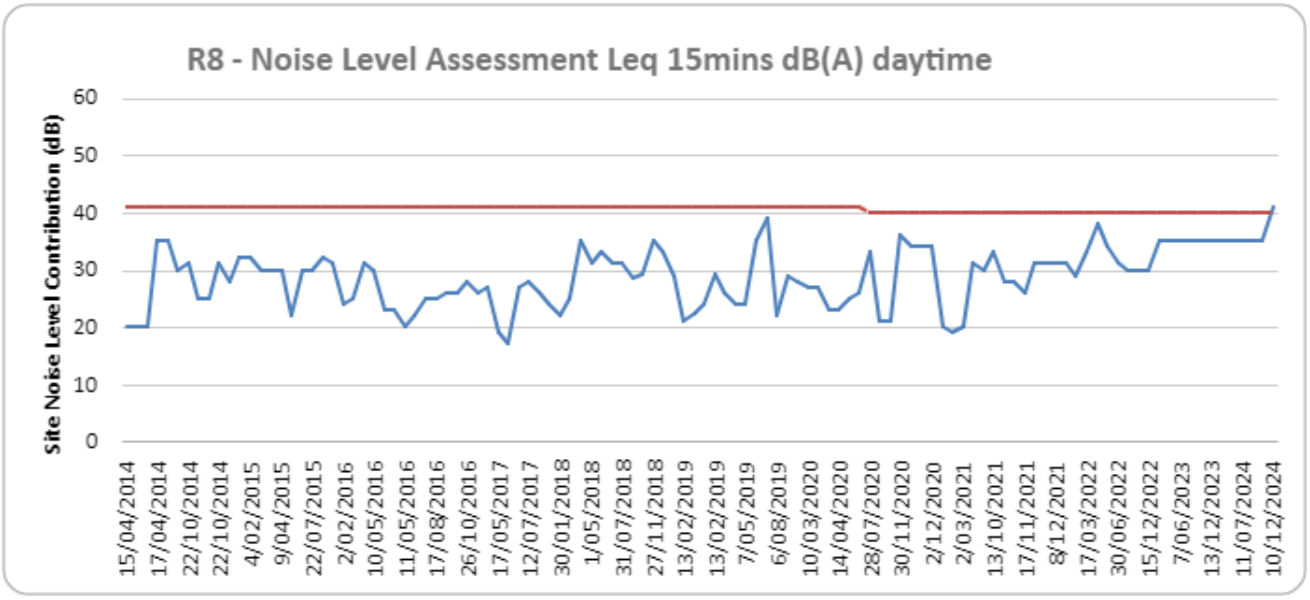


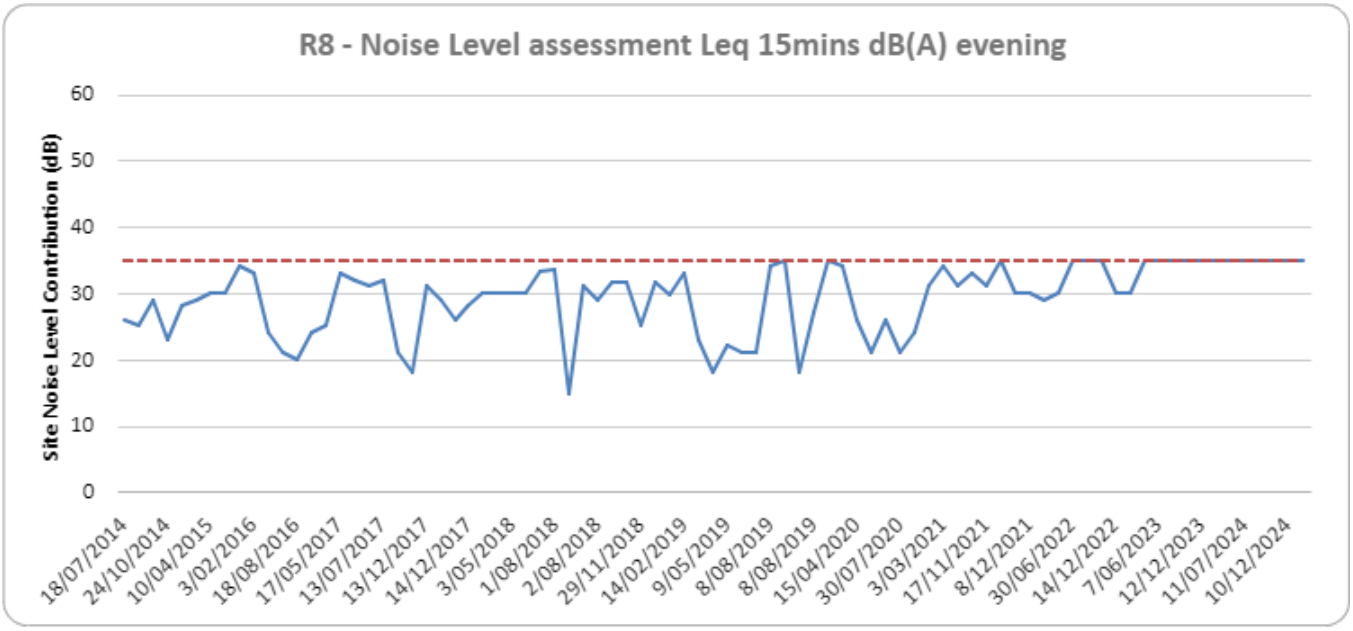
R 4 Off-Site Noise Level Trends (LAeq 15) 2016 – 2024





R8 Off-Site Noise Level Trends (LAeq 15) 2014 – 2024

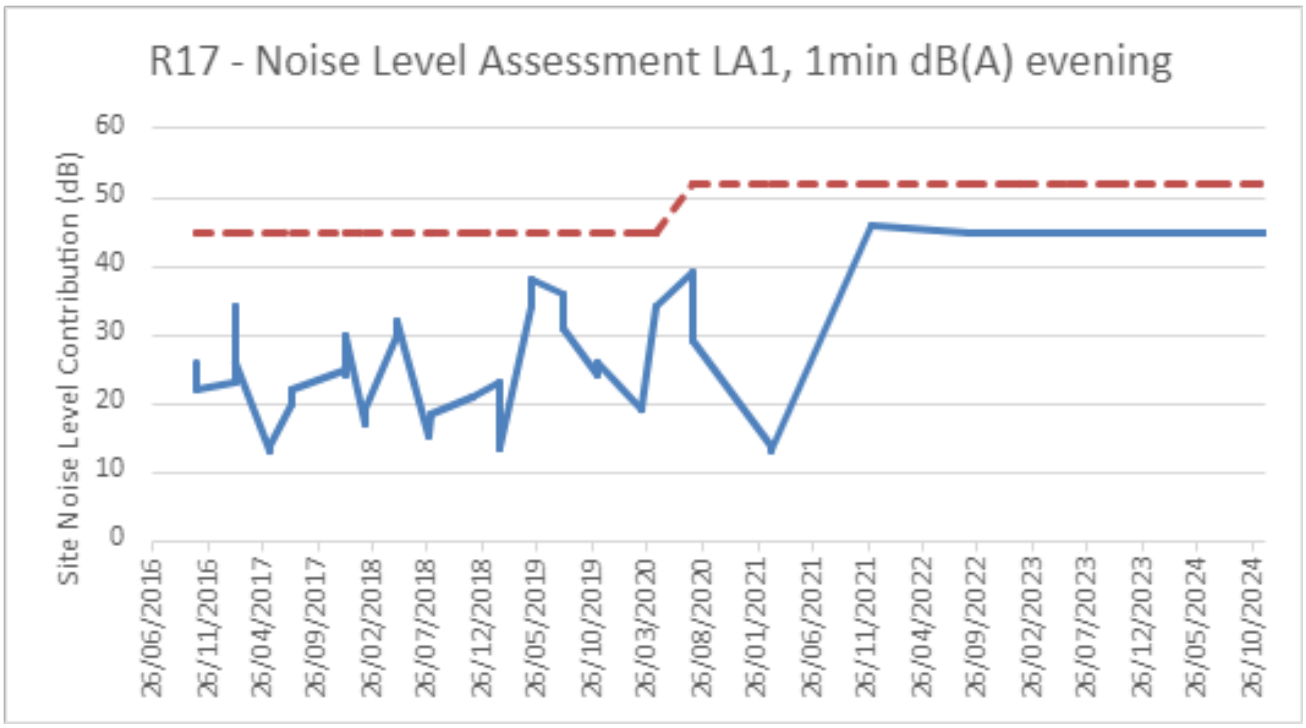




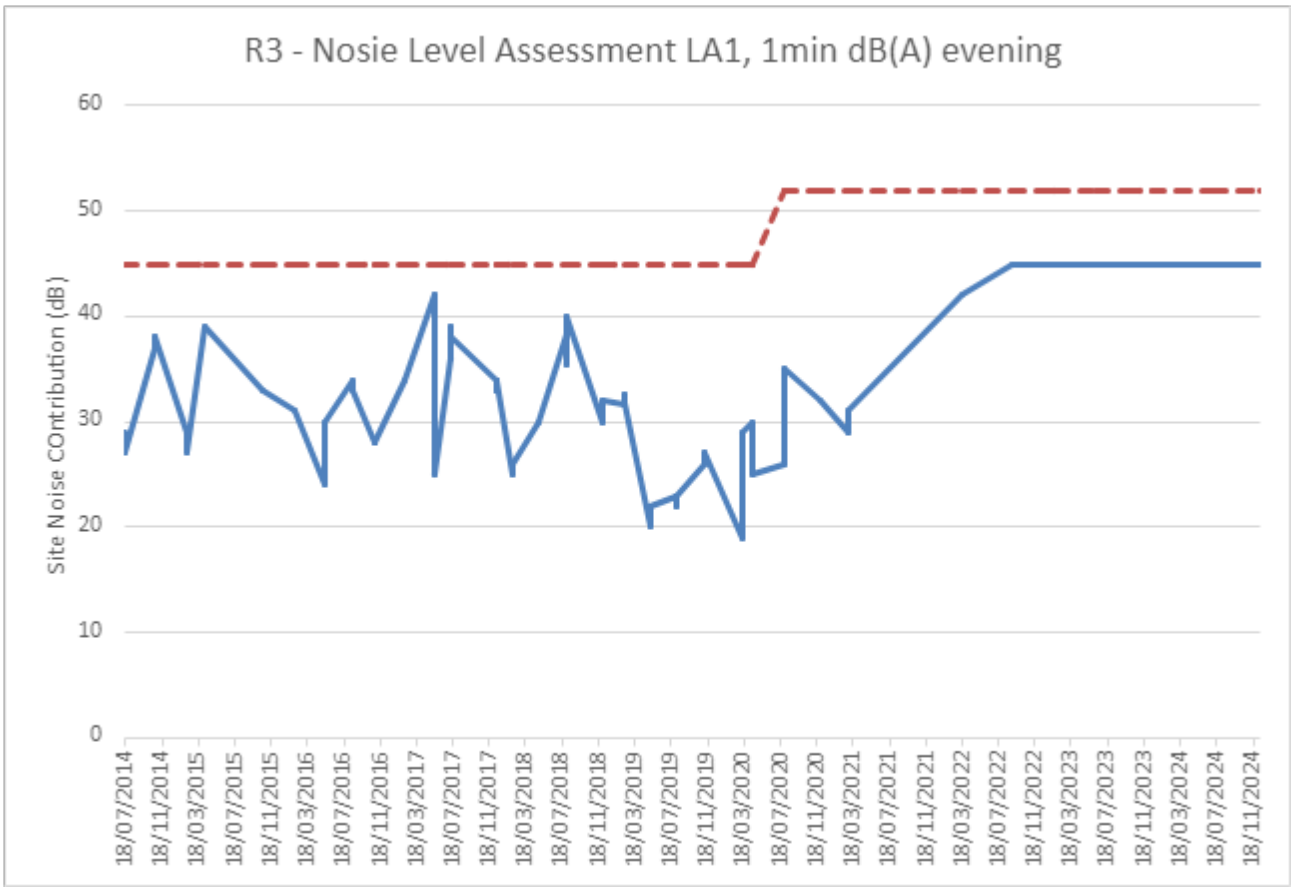
Noise Assessment Results (LA1 (1min))

Residential Receiver	Assessment Dates (2024)	Noise Level Assessment (LA1 (1min))		
		Compliance Criteria	Measured Noise Levels dB(A)	Compliance with Criteria
Receiver R3	March	52	<45	Yes
	July	52	<45/<45	Yes
	October	52	<45	Yes
	December	52	<45/<45	Yes
Receiver R2	March	52	<45	Yes
	July	52	<45/<45	Yes
	October	52	<45	Yes
	December	52	<45/<45	Yes
Receiver R8	March	52	<45	Yes
	July	52	<45/<45	Yes
	October	52	<45	Yes
	December	52	<45/<45	Yes
Receiver R4	March	52	<45	Yes
	July	52	<45/<45	Yes
	October	52	<45	Yes
	December	52	<45/<45	Yes
Receiver R17	March	52	<45	Yes
	July	52	<45/<45	Yes
	October	52	<45	Yes
	December	52	<45/<45	Yes

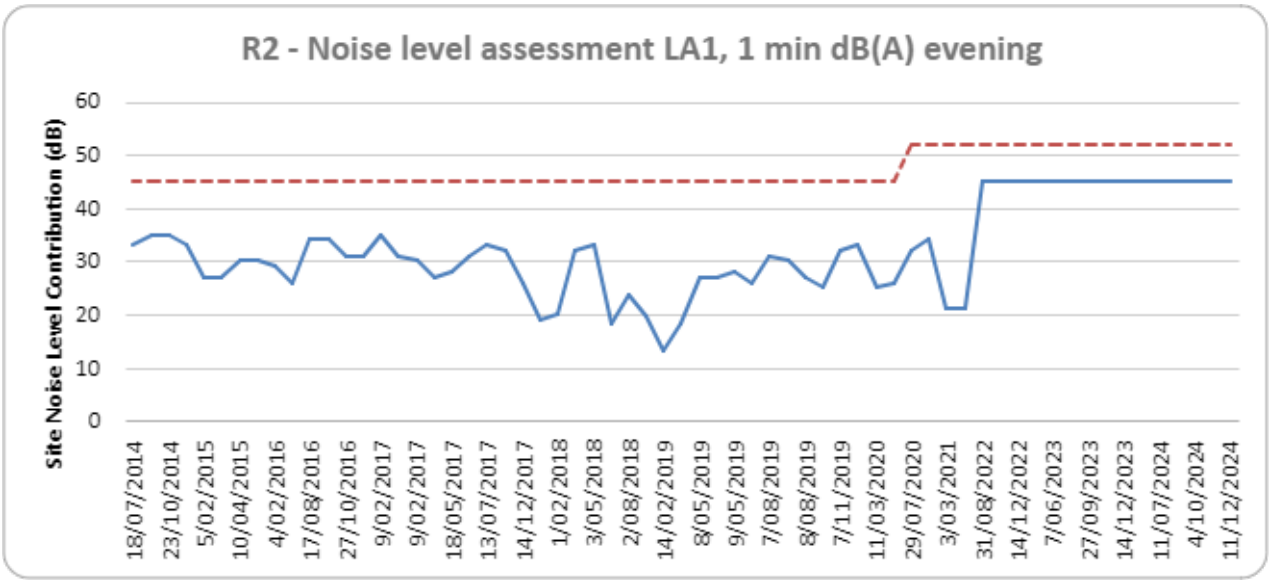
R17 Noise Level Trends (LA1, 1minute) 2016 – 2024



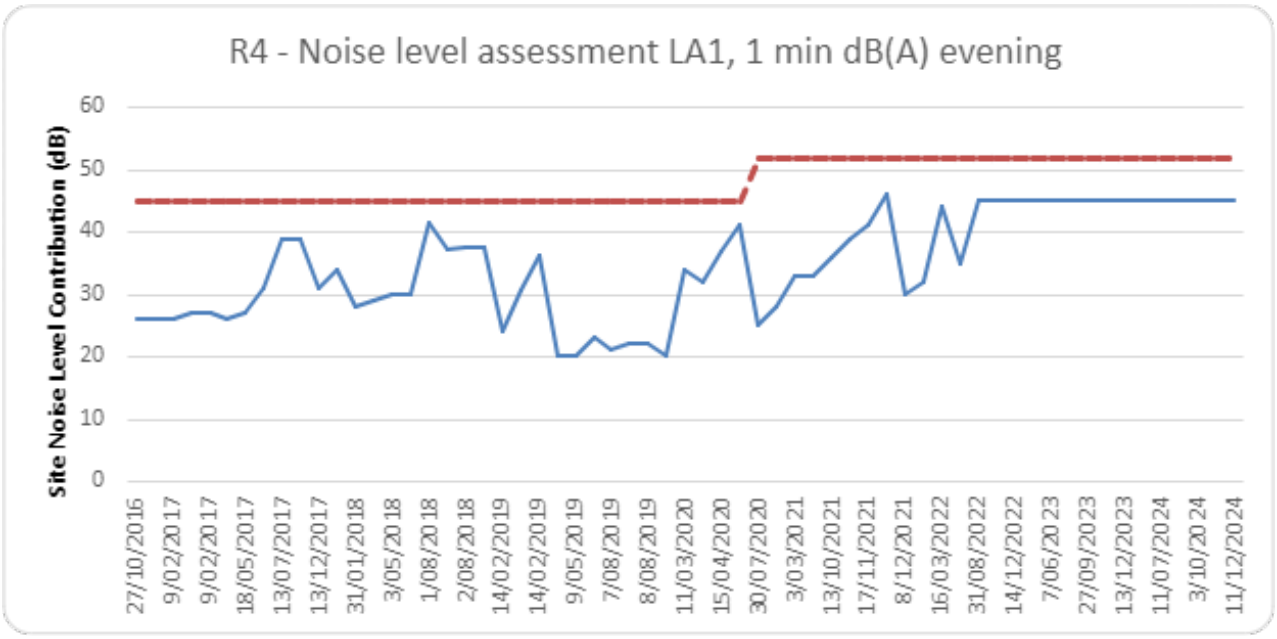
R3 Noise Level Trends (LA1, 1minute) 2014 – 2024



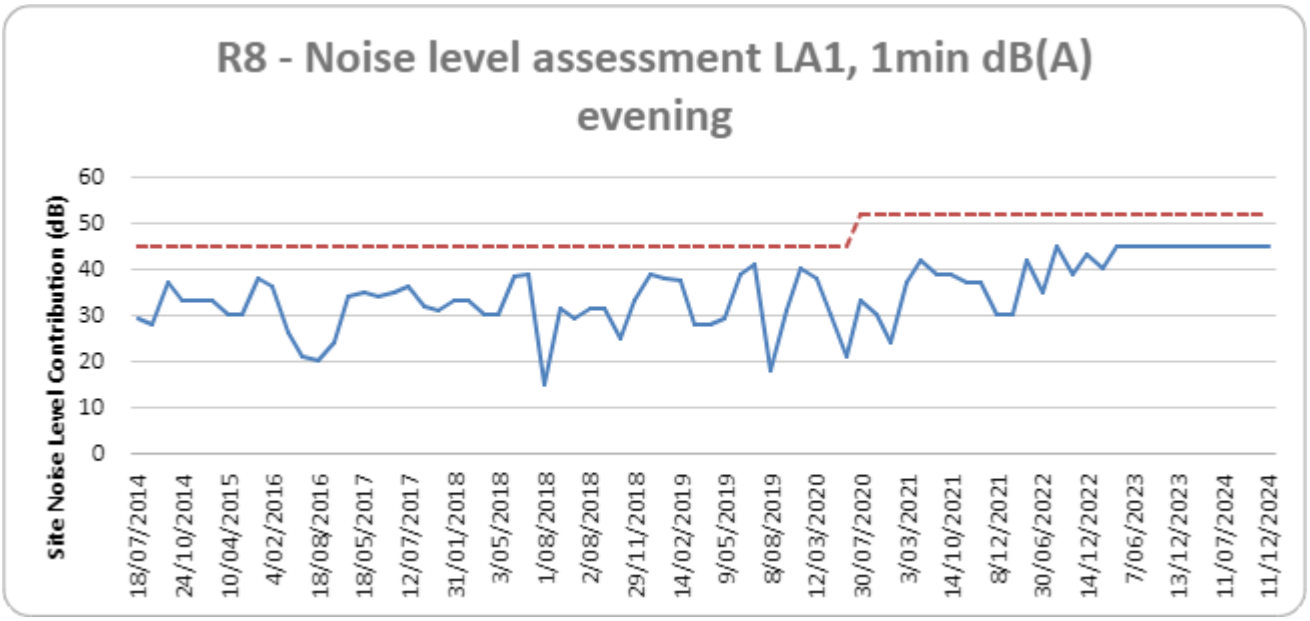
R2 Noise Level Trends (LA1, 1minute) 2014 – 2024



R4 Noise Level Trends (LA1, 1minute) – 2016 - 2024

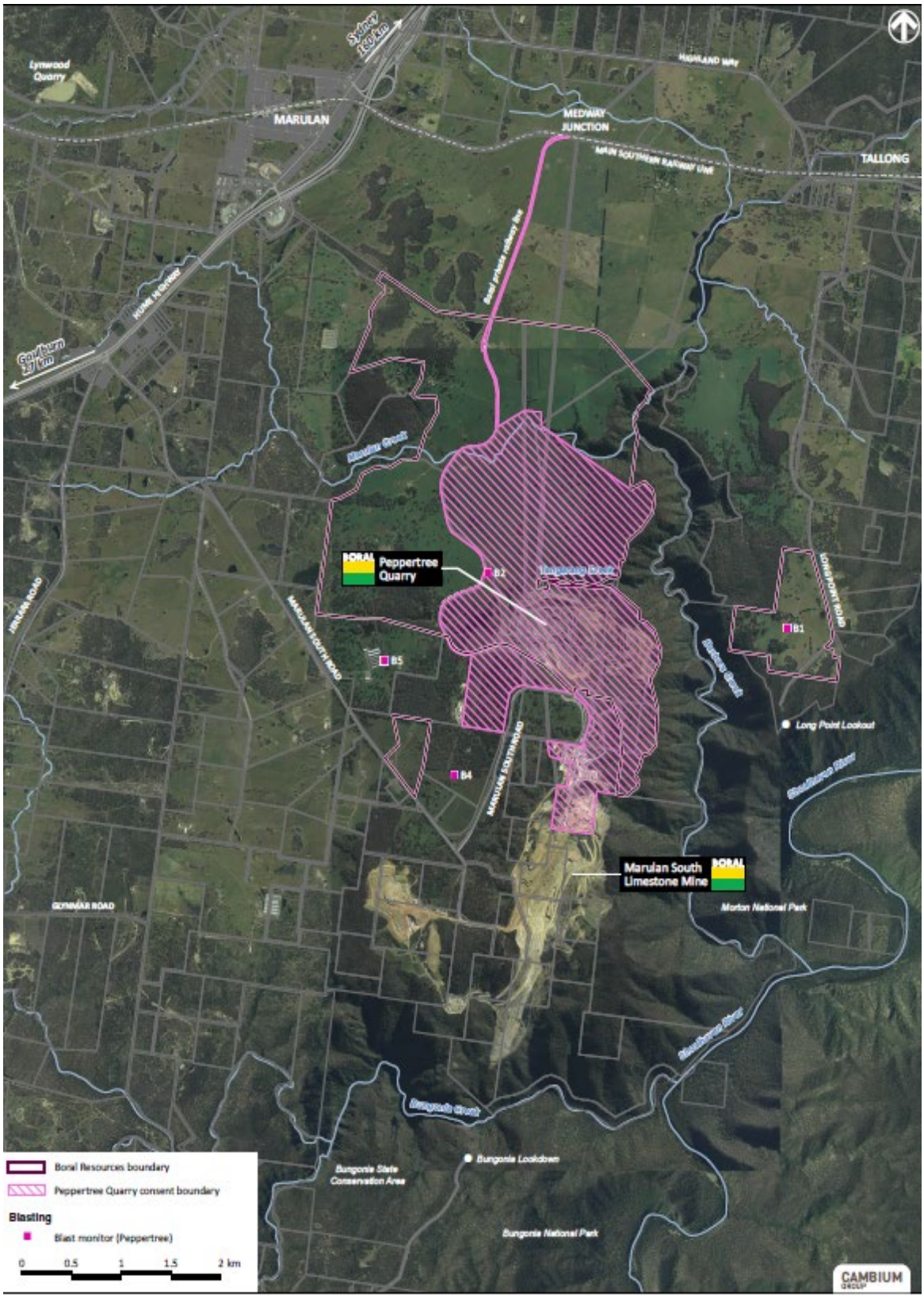


R8 Noise Level Trends (LA1, 1minute) – 2014 - 2024



APPENDIX 4 BLAST MONITORING INFORMATION

Blast monitoring locations



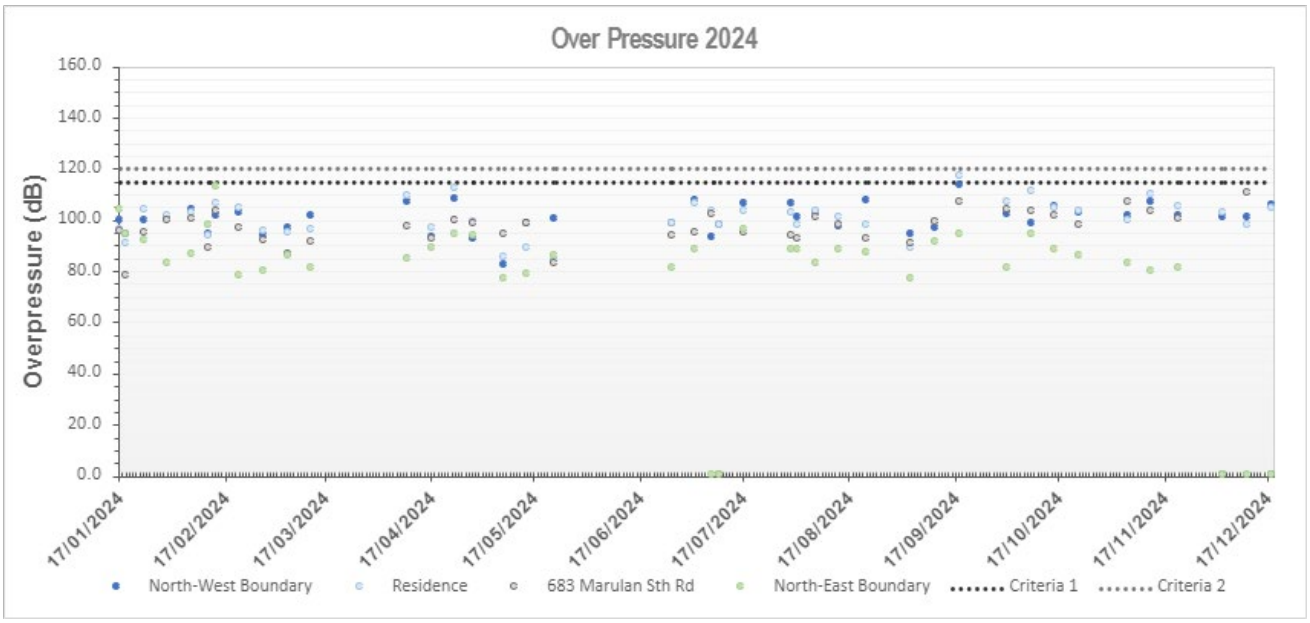
Blast Monitoring Results

Blast Date	Over Pressure (db – Linear) Max Criteria: 120 5% Exceedance: 115				Ground Vibration (mm/sec) Max Criteria: 10 5% Exceedance: 5				Compliance
	Monitoring Locations				Monitoring Locations				
	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	
17/01/2024	99.5	103.9	95.3	95.8	2.11	0.26	0.57	2.15	YES
19/01/2024	94.3	94.3	78.1	90.5	1.08	0.19	0.32	1.33	YES
24/01/2024	99.8	91.9	94.8	103.7	1.29	0.22	0.28	1.31	YES
31/01/2024	99.9	82.9	99.4	101.3	0.71	0.16	0.1	0.61	YES
7/02/2024	103.6	86.4	100.3	102.8	0.54	0.18	0.16	0.77	YES
12/02/2024	93.9	97.6	88.9	93.3	2.15	0.2	0.29	2.13	YES
14/02/2024	101.1	112.8	103.1	105.9	1.97	0.13	0.23	1.62	YES
21/02/2024	102.8	78.1	96.7	104.3	1.06	0.19	0.21	0.56	YES
28/02/2024	93.6	79.6	91.9	95.5	1.08	0.18	0.18	0.76	YES
6/03/2024	96.5	85.8	86.4	95	1.72	0.23	0.6	2.23	YES
13/03/2024	101.4	81.2	90.9	96	1.79	0.17	0.48	1.96	YES
27/03/2024	95.4	85.1	93.3	95.4	0.95	0.22	0.24	1.36	YES
3/04/2024	98.5	89.4	94.6	100.2	1.22	0.12	0.2	1.56	YES
4/04/2024	104.1	81.2	102.9	109.5	0.79	0.13	0.2	0.87	YES
10/04/2024	107	84.6	97.3	109.2	0.97	0.19	0.25	0.77	YES
17/04/2024	92.9	88.9	92.3	96.7	3.1	0.14	0.3	3.09	YES
24/04/2024	108.2	94.1	99.4	112	9.89	0.17	0.59	6.12	YES
29/04/2024	92.3	93.3	98.1	98.8	0.51	0.15	0.09	0.23	YES
8/05/2024	81.9	76.9	94.3	85.3	0.06	0.06	0.05	0.05	YES

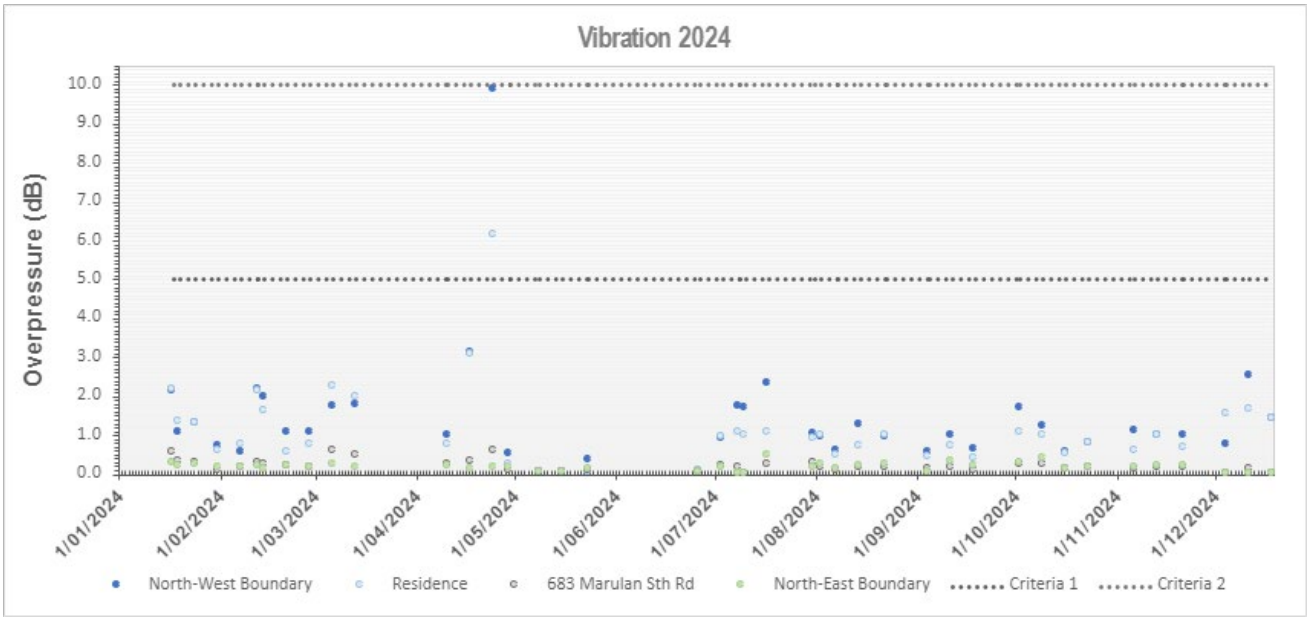
Blast Date	Over Pressure (db – Linear) Max Criteria: 120 5% Exceedance: 115				Ground Vibration (mm/sec) Max Criteria: 10 5% Exceedance: 5				Compliance
	Monitoring Locations				Monitoring Locations				
	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	
15/05/2024	98.3	78.6	98.4	88.6	0.06	0.06	0.05	0.06	YES
23/05/2024	100	86	82.9	83.8	0.37	0.12	0.07	0.05	YES
26/06/2024	98.5	80.8	93.3	98.1	0.06	0.05	0.06	0.07	YES
3/07/2024	107.4	88	94.6	106.1	0.9	0.17	0.19	0.95	YES
8/07/2024	93	0	102.1	102.9	1.73	0	0.18	1.06	YES
10/07/2024	98	0	0	97.9	1.7	0	0	0.98	YES
17/07/2024	106	96.1	94.7	103.4	2.31	0.49	0.24	1.07	YES
31/07/2024	106.2	88	93.4	102.8	1.03	0.15	0.26	0.9	YES
2/08/2024	100.7	88	92.3	97.7	0.95	0.22	0.15	0.98	YES
7/08/2024	102.6	82.9	100.8	103.4	0.6	0.12	0.09	0.46	YES
14/08/2024	96.9	88	97.5	100.5	1.28	0.2	0.17	0.72	YES
22/08/2024	107.6	87	92.3	97.9	0.95	0.22	0.15	0.98	YES
4/09/2024	94.1	76.9	90.6	88.9	0.54	0.06	0.11	0.43	YES
11/09/2024	96.6	91.4	98.9	98.8	1	0.3	0.18	0.73	YES
18/09/2024	113.4	94.2	107	117.1	0.65	0.19	0.1	0.4	YES
2/10/2024	102	81.2	103.5	106.9	1.7	0.27	0.25	1.08	YES
9/10/2024	98.3	94.2	103.4	110.7	1.21	0.4	0.25	0.98	YES
16/10/2024	105.1	88	101.1	104.2	0.57	0.14	0.12	0.5	YES
23/10/2024	102.6	85.8	97.8	102.9	0.8	0.18	0.16	0.79	YES
06/11/2024	101.3	82.9	106.6	99.5	1.09	0.16	0.11	0.6	YES
13/11/2024	107	79.6	103	109.5	0.98	0.21	0.15	0.97	YES

Blast Date	Over Pressure (db – Linear) Max Criteria: 120 5% Exceedance: 115				Ground Vibration (mm/sec) Max Criteria: 10 5% Exceedance: 5				Compliance
	Monitoring Locations				Monitoring Locations				
	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	B2 (north west)	B1 (north east)	B4 Marulan sth rd)	B5 (Residence)	
21/11/2024	101.3	81.2	100.1	104.9	0.97	0.21	0.16	0.66	YES
4/12/2024	101	No Trigger	No Trigger	102.8	0.76	No Trigger	No Trigger	1.52	YES
11/12/2024	101	No Trigger	110.2	97.5	2.54	No Trigger	0.13	1.65	YES
18/12/2024	105.5	No Trigger	No Trigger	104.2	1.4	No Trigger	No Trigger	1.4	YES

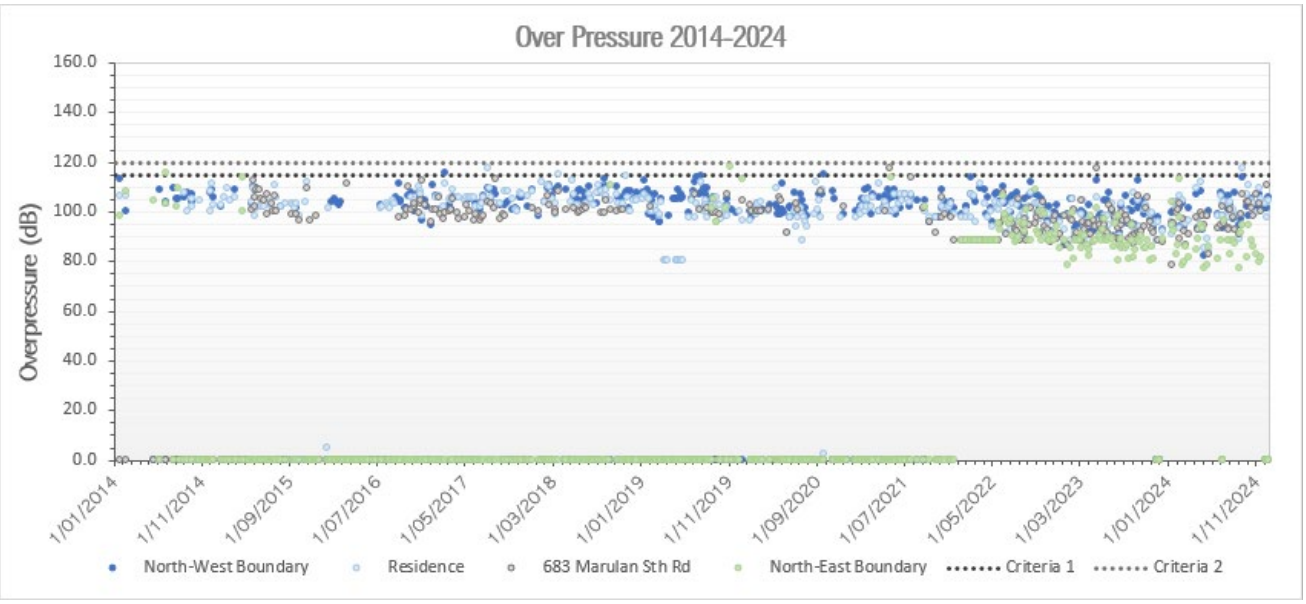
Blasting Overpressure Performance for 2024



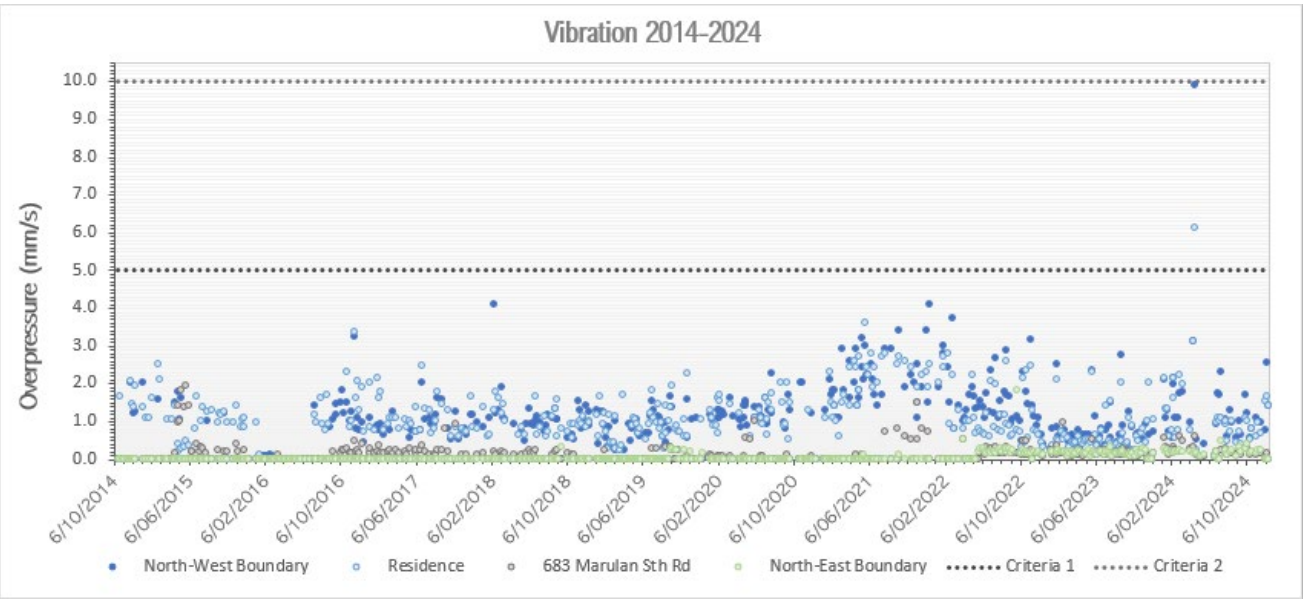
Blasting Ground Vibration Performance for 2024



Long Term Blast Trends – Overpressure

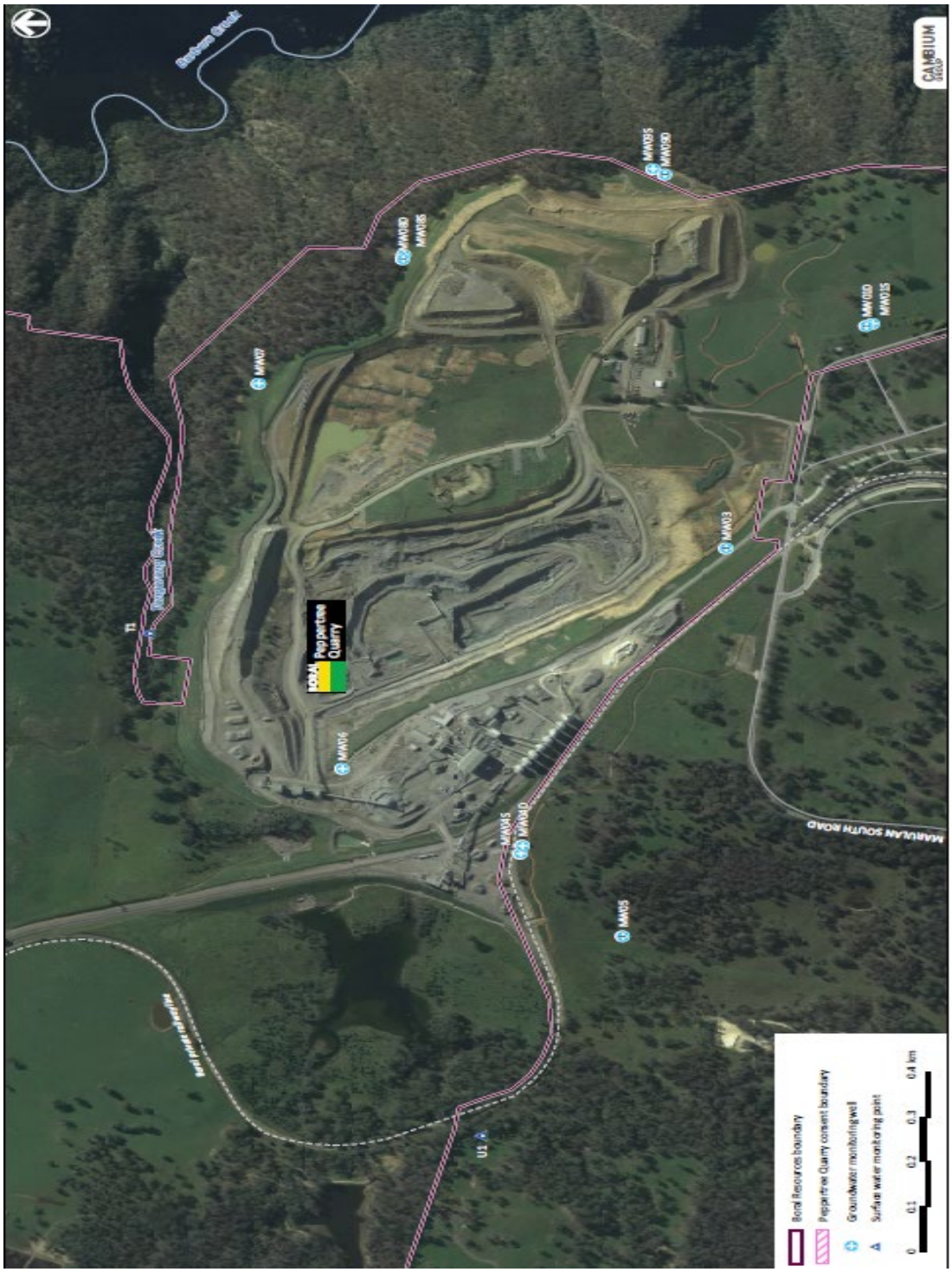


Long Term Blast Trends – Vibration



APPENDIX 5 SURFACE AND GROUNDWATER MONITORING INFORMATION

Surface and groundwater monitoring locations



Surface Water Monitoring Results (2024)

Parameter	Dam				Marulan South Creek				Tangarang Creek - Downstream				Tangarang Creek - Upstream				Barbers Creek - Upstream				Barbers Creek - Downstream			
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Ph	8.19	7.47	7.36	7.88	7.63	NA	7.51	8.02	7.95	NA	8.3	7.94	7.64	7.84	7.49	NF	7.74	6.45	7.5	7.96	7.76	6.56	7.41	7.93
Total Suspended solids (mg/l)	2	7	<5	<5	30	NA	<5	<5	<2	NA	<5	<5	183	24	17	NF	<5	<5	<5	<5	10	<5	<5	<5
Total Dissolved solids (mg/l)	276	136	344	642	433	NA	386	1090	386	NA	433	497	770	220	888	NF	248	198	304	484	260	203	322	479
Ammonia -N (mg/l)	<0.1	0.1	0.04	0.02	<0.1	NA	0.02	0.14	<0.1	NA	0.02	0.05	<0.1	0.05	0.04	NF	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate-N (mg/l)	0.48	0.25	0.95	<0.01	0.1	NA	<0.01	0.28	0.69	NA	0.87	0.27	0.05	0.05	<0.01	NF	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite-N (mg/l)	0.04	0.01	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	NA	<0.01	<0.01	<0.01	<0.01	<0.01	NF	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate (mg/l)	22.1	2	38	67	3.5	NA	6	33	19.5	NA	21	22	4.5	<10	8	NF	13	12	12	26	16	16	16	34
Chloride (mg/l)	36.3	20	102	182	90.1	NA	149	358	45.5	NA	114	130	193	52	422	NF	54	38	81	144	53	37	74	136
Turbidity (NTU)	3.1	13.8	4	2.4	3.6	NA	4.2	4.4	1.5	NA	1.4	2.4	25.9	18.2	8.4	NF	NA	NA	NA	NA	NA	NA	NA	NA
Calcium (mg/l)	26.8	13	43	65	35.5	NA	36	86	34.3	NA	50	63	54.6	14	70	NF	28	23	32	54	31	24	36	57
Potassium (mg/l)	5.4	4	4	6	9.3	NA	4	2	4.6	NA	2	<1	6	4	4	NF	4	2	3	3	4	3	3	4
Magnesium (mg/l)	10.6	5	18	25	20	NA	25	54	14.4	NA	28	31	33.4	8	58	NF	14	10	19	33	15	12	19	32
Sodium (mg/l)	28.5	16	49	71	52.6	NA	59	127	35.4	NA	64	67	66.8	24	108	NF	29	21	37	56	30	22	36	56
Total phosphorus (mg/l)	0.05	0.14	0.07	0.03	0.05	NA	0.02	0.01	0.04	NA	0.03	0.01	0.17	0.05	0.02	NF	0.03	0.06	<0.01	0.04	0.03	0.03	<0.01	0.03
Total Nitrogen (mg/l)	1.78	1.7	1.8	0.9	1.36	NA	0.7	1.7	1.44	NA	1.1	0.8	2.51	1.8	0.8	NF	1.2	1.2	0.8	0.2	1.2	1.7	0.9	0.4
Hardness (CaCo3) (mg/l)	89	49	108	140	242	NA	141	224	124	NA	232	257	129	63	137	NF	128	99	158	271	139	109	168	274
TKN (mg/l)	1.26	1.4	0.8	0.9	1.26	NA	0.7	1.4	0.75	NA	0.2	0.5	2.46	1.7	0.8	NF	0.8	0.7	0.6	0.2	0.9	0.9	0.7	0.4
Faecal Coliform (cfu/100ml)	4	97	-3	-2	16	NA	-2	-2	90	NA	-2	29	20	3800	24	NF	NA	NA	NA	NA	NA	NA	NA	NA
TPH C10-C14 (µg/l)	<50	<50	<50	<50	<50	NA	<50	<50	<50	NA	<50	<50	<50	<50	<50	NF	NA	NA	NA	NA	NA	NA	NA	NA

TPH C15-C28 (µg/l)	<100	<100	<100	<100	<100	NA	<100	<100	<100	NA	<100	<100	<100	<100	<100	NF	NA	NA	NA	NA	NA	NA	NA	NA
TPH C29-C36 (µg/l)	<50	<50	<50	<50	190	NA	<50	<50	<50	NA	<50	<50	<50	<50	<50	NF	NA	NA	NA	NA	NA	NA	NA	NA
sum TPH C10-C36 (µg/l)	<50	<50	<50	<50	190	NA	<50	190	<50	NA	<50	<50	<50	<50	<50	NF	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthere	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Flourene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Anthracence	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	1.2	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b+k)fluoranthene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	<0.5	<0.5	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	<0.5	<0.5	<0.5	<0.5	<0.5	NF	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	<1	<1	<1	<1	<1	NA	<1	<1	<1	NA	<1	<1	<1	<1	<1	NF	NA	NA	NA	NA	NA	NA	NA	NA

note NF – No flow NA – not analysed

Note: sampling error identified for 2nd quarter. No sample available for Marulan South Creek or Tangarang Creek- Downstream.

Quarters

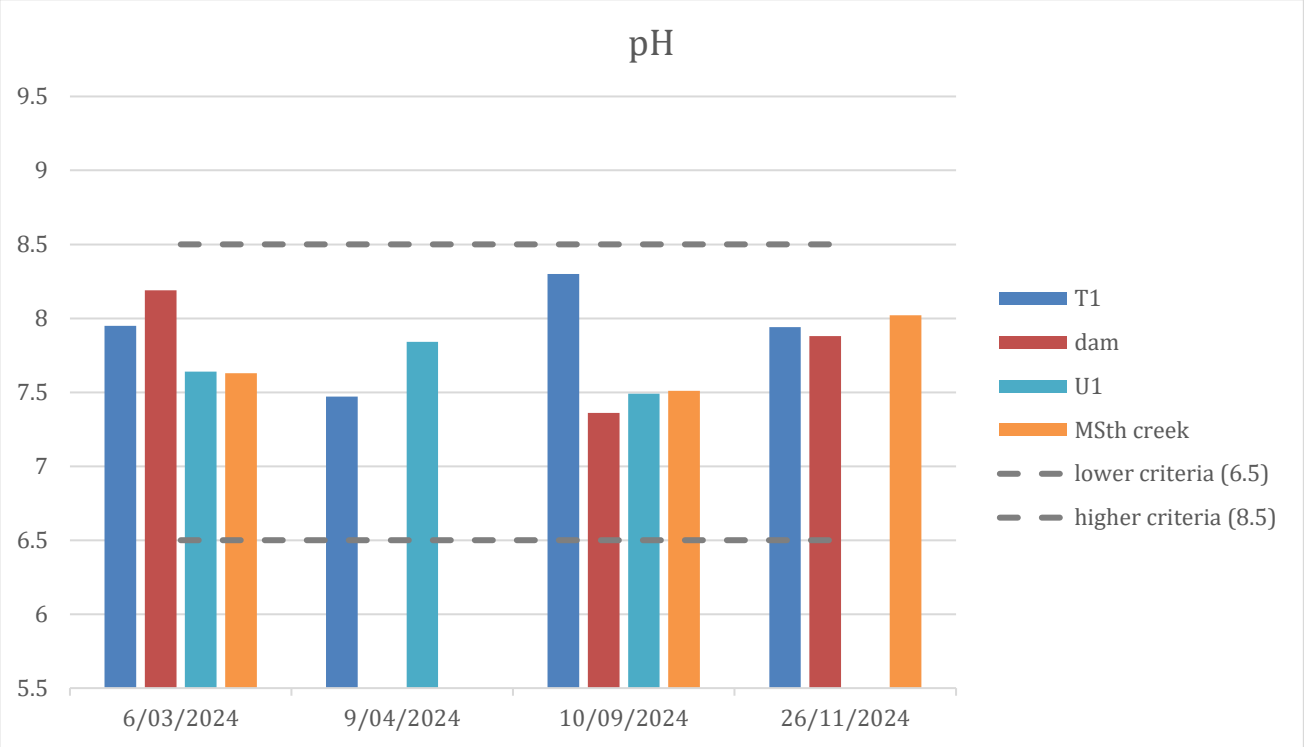
1st – 6th March 2024

2nd – 9th April 2024

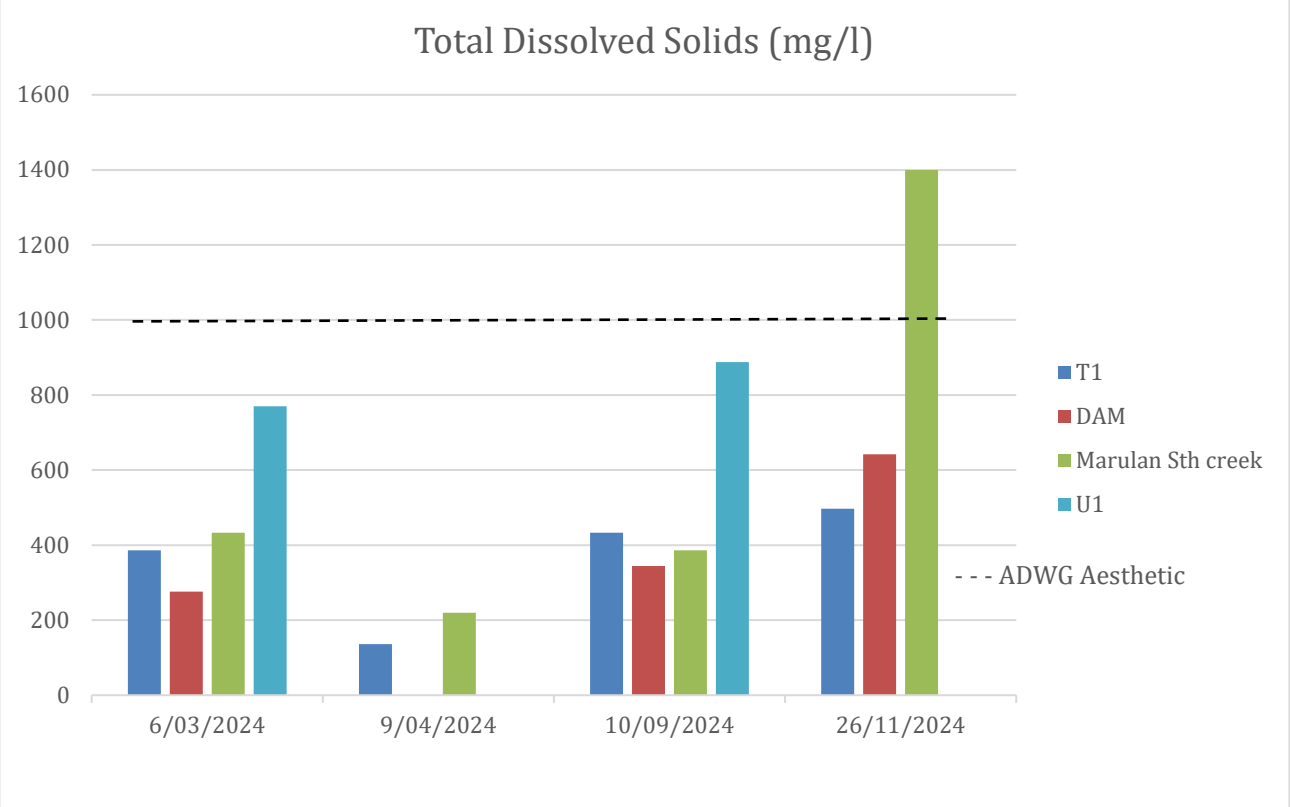
3rd – 10th September 2024

4th – 26th November 2024

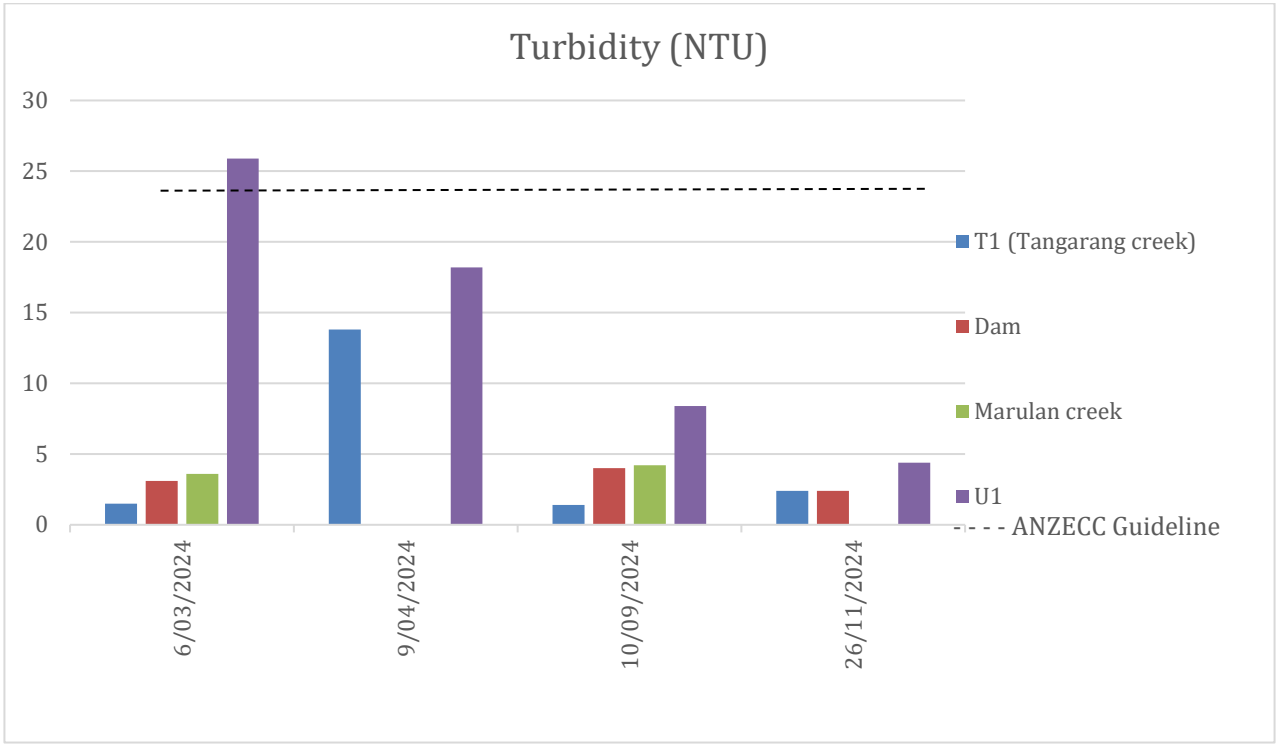
pH Surface Waters Trends 2024



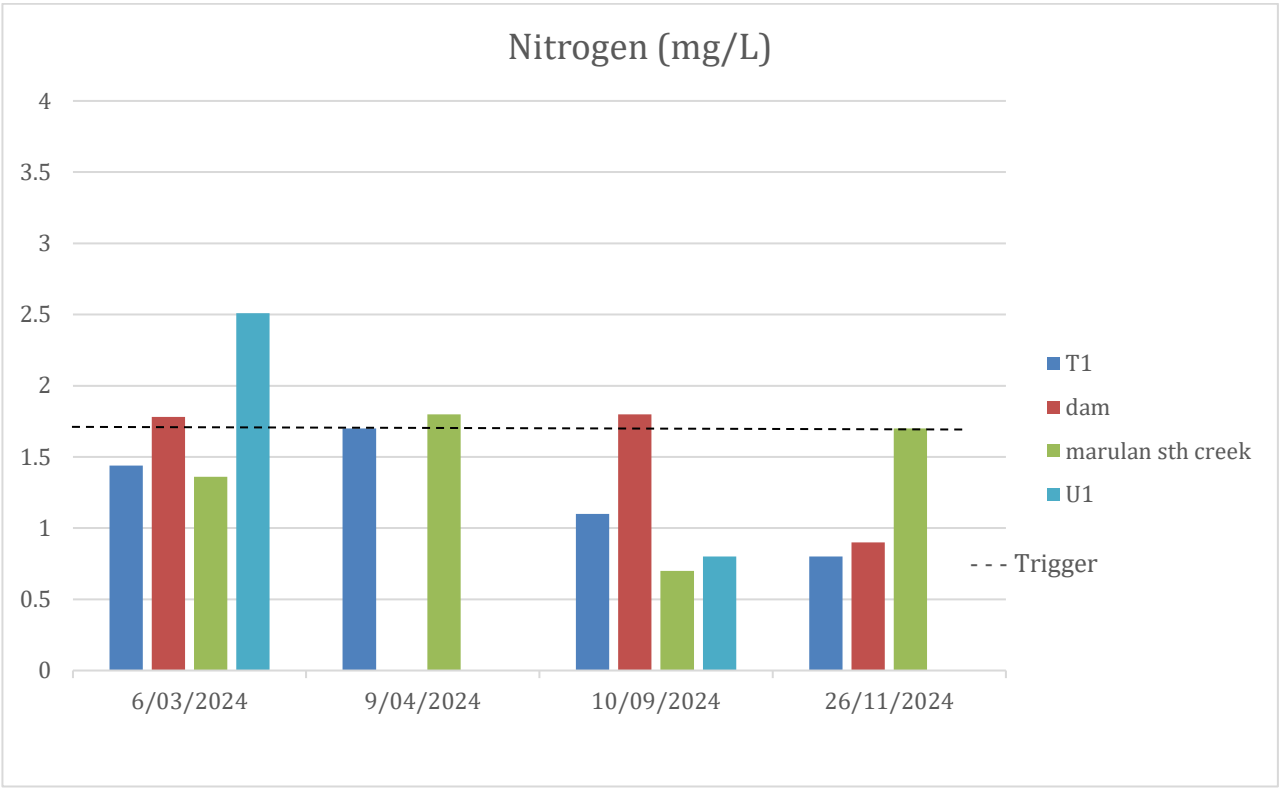
TDS surface water trends 2024



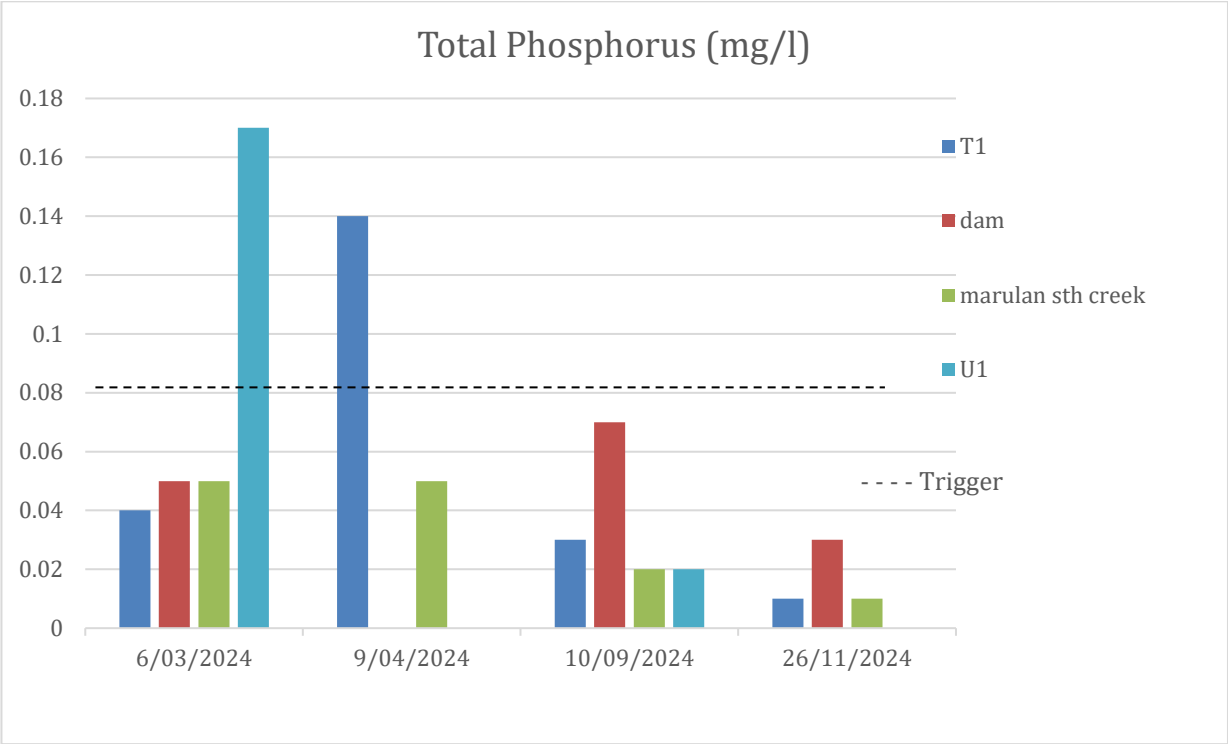
Turbidity surface water trends 2024



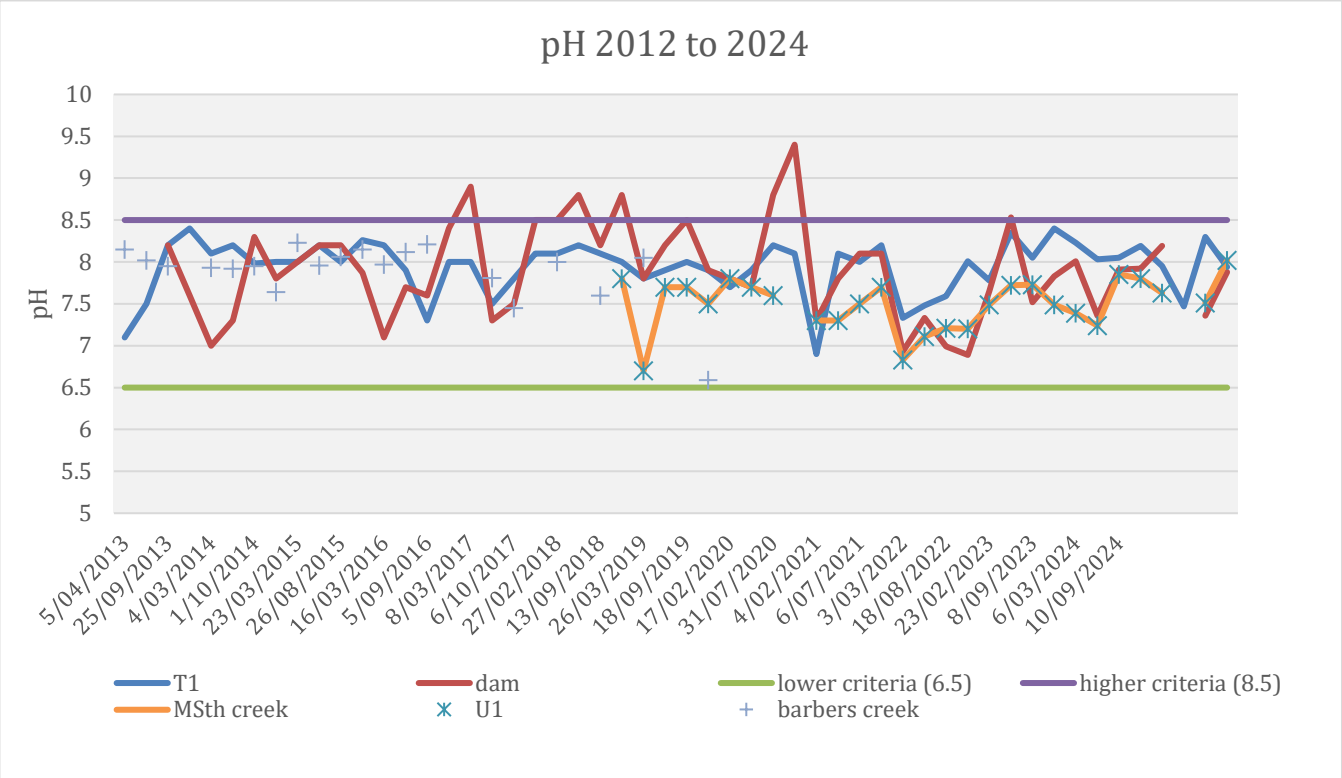
Nitrogen surface water trends 2024



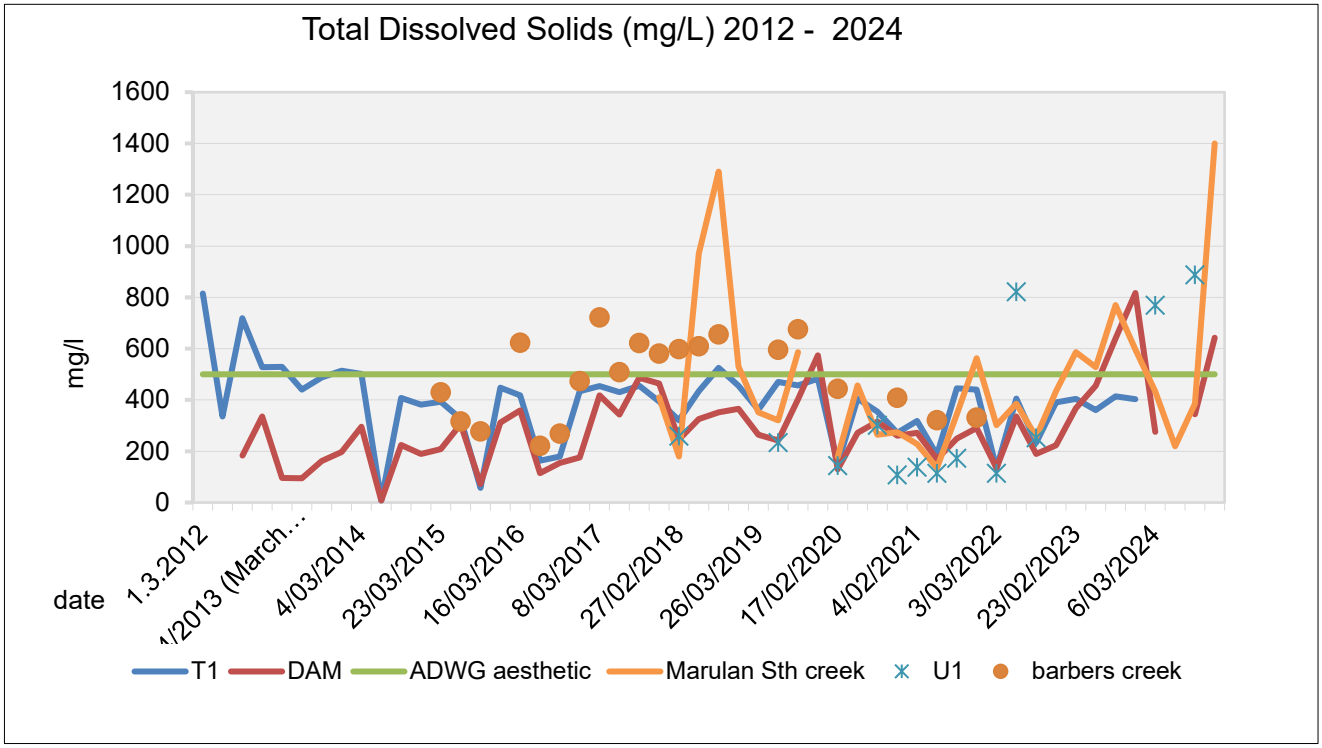
Total phosphorus surface water trends 2024



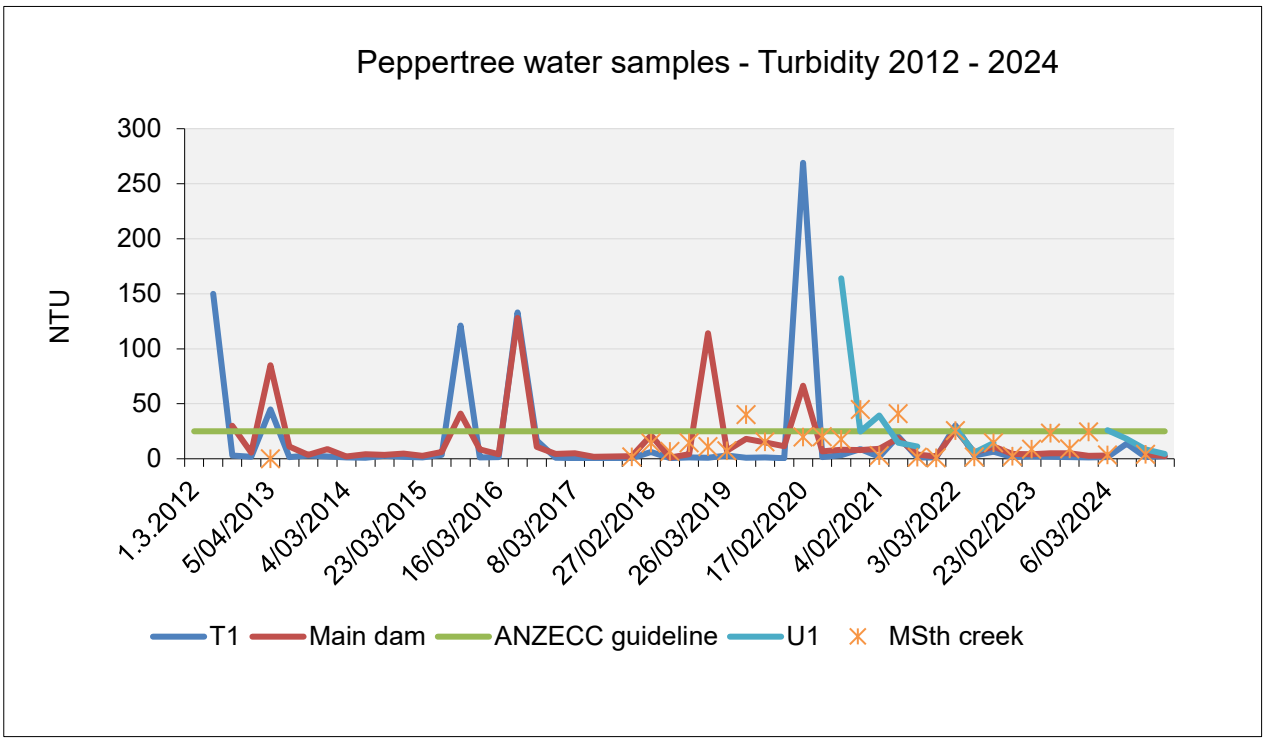
Long Term Water Quality - pH



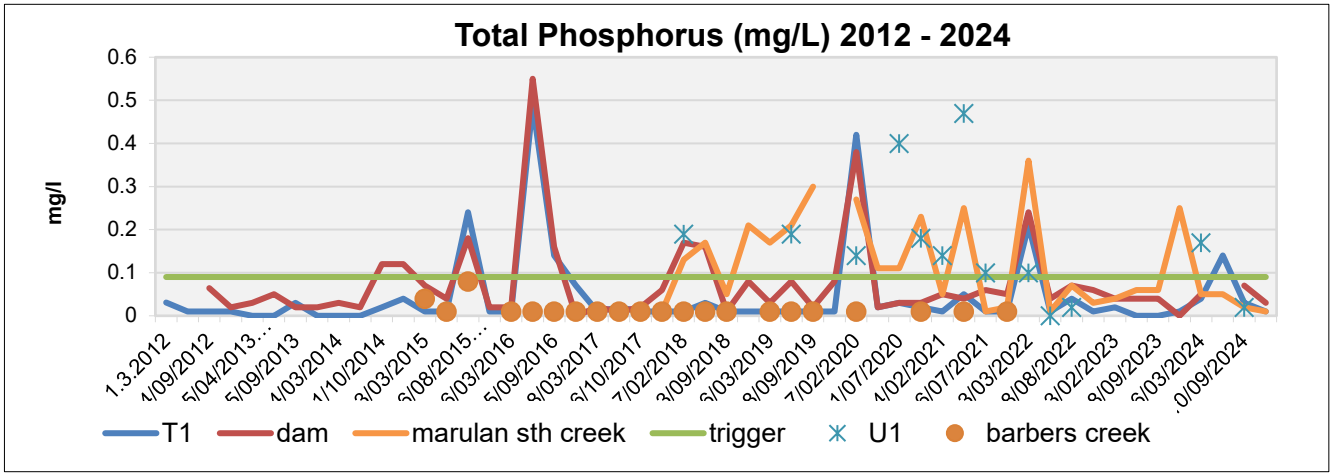
Long Term Water Quality – TDS



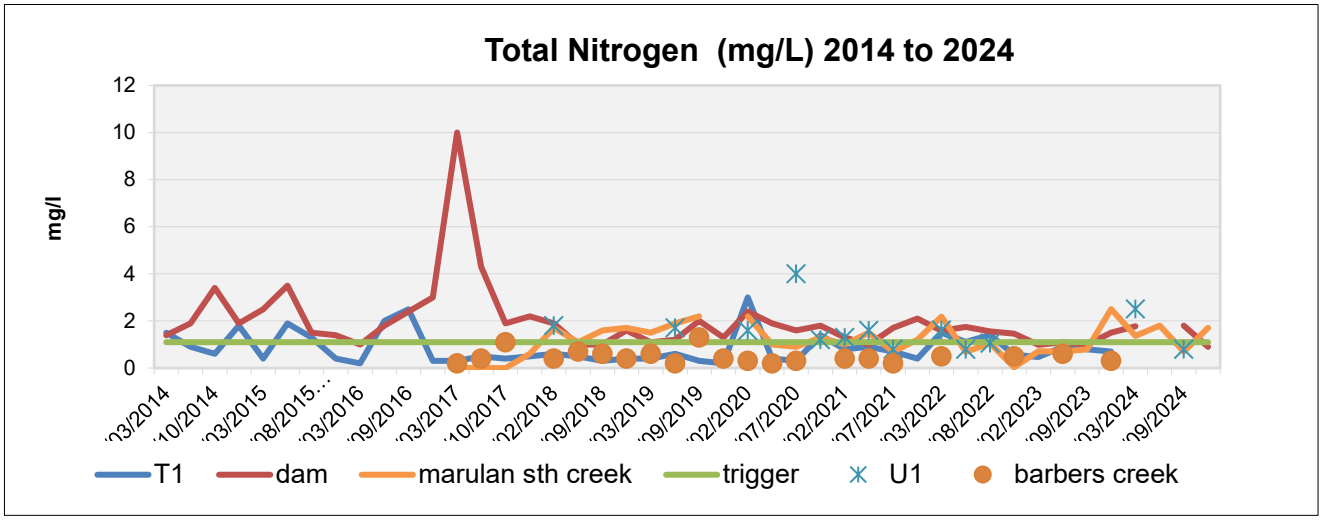
Long Term Water Quality – Turbidity



Long Term Water Quality – Total Phosphorus



Long Term Water Quality – total Nitrogen

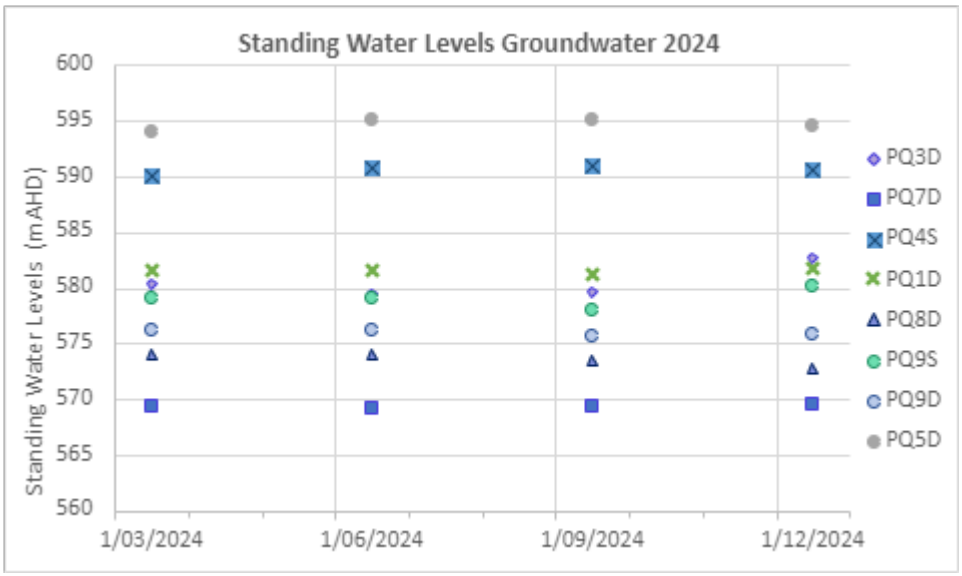


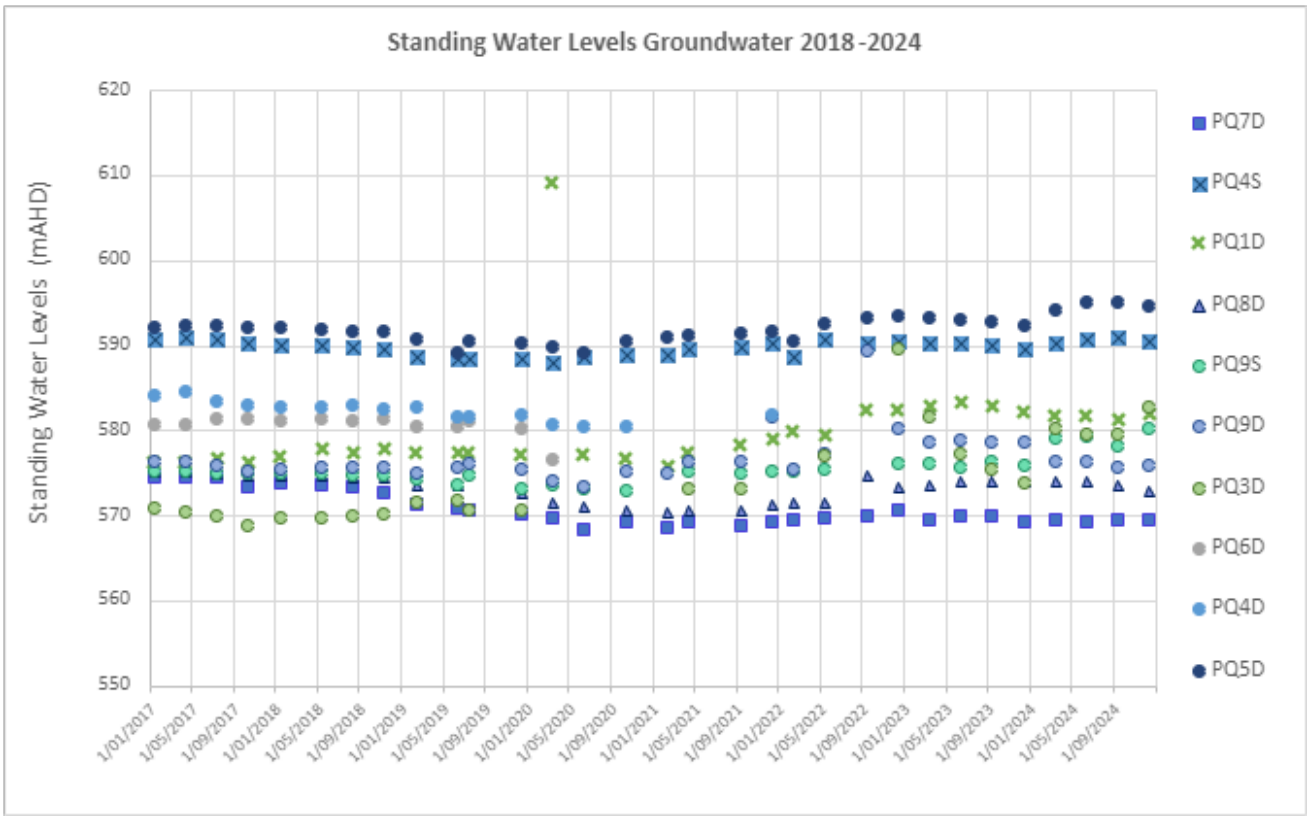
Groundwater Field Parameters

Bore ID	Field Parameters 2024											
	pH				EC (µs/cm)				DO (%)			
	March	June	September	December	March	June	September	December	March	June	September	December
PQ01S	DRY											
PQ01D	5.86	7.64	7.57	6.35	3697	3565	3555	3470	46.6	42.5	47.1	34.7
PQ03D	BLOCKAGE AT 30M NO SAMPLING POSSIBLE											
PQ04D	INTERIOR OF WELL CASING DAMAGED. NO SAMPLING POSSIBLE											
PQ04S	7.4	7.67	7.97	7.91	2552	2525	2748	2706	32.1	51.3	48.3	43.2
PQ5D	6.55	6.81	6.95	7.10	1906	1939	2102	2086	29	22.9	31.8	21.4
PQ6D	WELL CASING CRACKED											
PQ7D	8.59	8.69	8.25	8.62	502	521	586	557	33.8	42.8	40.7	34.0
PQ8D	6.65	6.79	7.13	8.47	3346	3305	3615	2091	38.6	31.1	39.8	32.9
PQ8S	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry
PQ9D	7.63	6.85	6.81	6.89	2042	2510	2130	2007	72.2	66.1	48.9	13.5
PQ9s	BLOCKAGE AT 31.7M NO SAMPLING POSSIBLE											

Groundwater Standing Water Levels

Bore ID	Standing Water Levels (mAHD) 2024			
	March	June	September	December
PQ01D	581.6	581.6	581.2	581.8
PQ01S	DRY			
PQ03D	580.29	579.52	579.59	582.69
PQ04D	NS	NS	NS	NS
PQ04S	590.15	590.75	590.95	590.55
PQ5D	594.03	595.03	595.13	594.51
PQ6D	NS	NS	NS	NS
PQ7D	569.4	569.2	569.4	569.5
PQ8D	574.01	574.01	573.61	572.81
PQ8S	DRY			
PQ9D	579.08	579.18	578.08	580.18
PQ9S	576.21	576.21	575.71	575.96


Standing Water Levels Groundwater 2024
Standing Water Levels (mAHD)
600
595
590
585
580
575
570
565
560
1/03/2024
1/06/2024
1/09/2024
1/12/2024
PQ3D
PQ7D
PQ4S
PQ1D
PQ8D
PQ9S
PQ9D
PQ5D


Standing Water Levels Groundwater 2018-2024
Standing Water Levels (mAHD)
620
610
600
590
580
570
560
550
1/01/2017
1/05/2017
1/09/2017
1/01/2018
1/05/2018
1/09/2018
1/01/2019
1/05/2019
1/09/2019
1/01/2020
1/05/2020
1/09/2020
1/01/2021
1/05/2021
1/09/2021
1/01/2022
1/05/2022
1/09/2022
1/01/2023
1/05/2023
1/09/2023
1/01/2024
1/05/2024
1/09/2024
PQ7D
PQ4S
PQ1D
PQ8D
PQ9S
PQ9D
PQ3D
PQ6D
PQ4D
PQ5D

Groundwater - Laboratory Analysis Results (2015 - 2024)

NOTES:

1. Shaded Cells: Exceedances of ANZECC (2000) threshold values
2. NA: Not Analysed
3. ND: Non-Detect

Sample ID	Date	Inorganics																
		Total Dissolved Solids	Suspended Solids	Turbidity	Total Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Sulfate	Chloride	Calcium	Magnesium	Potassium	Sodium	Fluoride	Nitrate + Nitrite as N	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Reactive Phosphorous as P	Oil & Grease
		mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L N	mg/L N	mg/L N	mg/L P	mg/L
		<10	<1	<1	<20	<20	<10	<5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.2	<0.2	<0.01	<10
ANZG 2018 (95% Protection Values)				25											0.015		0.25	0.02	
PQ01D	19/01/2017	2570	294	52.7	156			70	1180	197	144	28	335	0.1	0.07	1.1	1.2	1.33	<5
PQ01D	27/04/2017	2230	10	5.3	36			92	972	210	6	30	313	<0.1	1.68	0.4	2.1	<0.01	<5
PQ01D	27/07/2017	2130	9	0.6	27			93	830	249	7	32	374	0.1	3.03	0.3	3.3	<0.01	<5
PQ01D	26/10/2017	2190	124	27.2	18			123	948	190	47	41	370	<0.1	3.64	0.4	4	0.01	<5
PQ01D	23/01/2018	2100	117	85.5	28			108	1060	228	44	38	370	<0.1	3.51	1.2	4.7	0.1	**74**
PQ01D	11/05/2018	1840	103	44.6	25			125	1070	216	32	22	330	<0.1	3.59	3.1	6.7	0.06	**8**
PQ01D	8/08/2018	1970	48	42.4	10			104	854	214	52	27	334	<0.1	3.45	0.8	4.2	0.01	<5
PQ01D	8/11/2018	2690	53	46.1	16			90	1010	236	45	52	344	<0.1	2.94	0.5	3.4	0.03	<5
PQ01D	26/02/2019	2130			10			104	1080	235	49	36	384		2.81	0.3	3.1	<0.01	<5
PQ01D	12/06/2019	2030			10			104	1000	262	42	26	341		3.06	0.5	3.6	<0.01	<5
PQ01D	23/07/2019	2080			<1			139	976	237	52	34	380		2.75	1.3	4	0.1	<5
PQ01D	16/10/2020	2200	1.6	< 1	< 20	< 20	< 10	76	910	180	77	32	300	< 0.5	3.1	< 0.2	3.1	< 0.01	< 10
PQ01D	2/02/2021	3200	3.2	< 1	< 20	< 20	< 10	80	1000	190	77	17	330	< 0.5	2.6	1.6	4.2	< 0.01	< 10
PQ01D	21/04/2021	2400	9.8	-	< 20	< 20	< 10	79	1000	130	77	14	280	< 0.5	2.7	0.78	1.92	< 0.01	< 10

PQ01D	29/09/2021	1800	< 1	< 1	56	56	< 10	67	900	150	100	15	320	< 0.5	1.1	0.6	1.7	< 0.01	-
PQ01D	23/02/2022	3800	< 5	<1	32	32	<10	55	890	140	75	14	300	1.1	1.9	0.6	2.5	<0.05	<10
PQ01D	6/05/2022	2000	6.5	<1	<20	<20	<10	49	890	160	56	15	290	<0.5	2	0.8	2.8	<0.01	<10
PQ01D	29/09/2022	2560	5		10	10	<1	49	941	201	35	13	289	0.1	2.15	0.2	2.4	0.02	<5
PQ01D	21/12/2022	2020	< 5	0.6	13	13	<1	54	1050	222	47	17	356	<0.1	2.71	0.7	3.4	<0.01	<5
PQ01D	21/03.2023	1960	7	2.1	11	11	<1	75	1050	208	49	15	349	<0.1	3.14	1	4.1	0.01	<5
PQ01D	21/06/2023	2370	32	7.2	26	26	<1	68	1080	229	61	13	372	<0.1	3.06	0.5	3.6	0.01	<5
PQ01D	4/12/2023	2430	<5	3.6	12	12	<1	63	1100	276	64	14	368	<0.1	2.51	0.4	2.9	0.01	<5
PQ01D	26/03/2024	2450	10	1.6	14	14	<1	64	1130	320	68	15	372	<0.1	3.12	0.9	4.1	0.01	<5
PQ01D	19/06/2024	2670	28	4.2	15	15	<1	63	1100	308	73	13	383	<0.1	3.06	0.6	3.6	0.01	<5
PQ01D	11/09/2024	2380	36	4.9	25	25	<1	61	979	211	39	16	374	<0.1	3.73	0.7	3.9	0.01	<5
PQ01D	17/12/2024	2520	44	7.9	29	29	<1	57	1080	245	32	14	378	<0.1	3.62	0.6	2.9	0.01	<5
PQ03D	19/01/2017	1110	123	91.3	556			13	224	64	<1	222	196	0.4	<0.01	1.2	1.2	0.01	<5
PQ03D	27/04/2017	1100	88	53.3	518			14	212	76	<1	160	159	0.3	<0.01	1.5	1.5	0.05	<5
PQ03D	27/07/2017	977	118	49.3	503			12	174	78	<1	171	176	0.5	0.02	1.1	1.1	<0.01	<5
PQ03D	26/10/2017	923	111	55.5	457			12	198	37	<1	148	175	0.4	<0.01	1.3	1.3	0.06	<5
PQ03D	23/01/2018	975	81	49	303			12	215	76	<1	141	178	0.4	<0.01	1.3	1.3	0.03	<5
PQ03D	11/05/2018	910	26	9.2	400			18	226	80	<1	111	162	0.4	<0.01	1.5	1.5	0.06	<5
PQ03D	8/08/2018	956	32	32.7	482			18	197	87	<1	110	168	0.4	0.03	1.2	1.2	0.03	<5
PQ03D	8/11/2018	785	443	536	401			20	216	88	<1	106	172	0.4	0.02	1.9	1.9	0.19	<5
PQ03D	26/02/2019	886			377			24	201	90	<1	117	194		0.02	1.3	1.3	<0.01	<5
PQ03D	12/06/2019	1000			423			28	214	99	<1	122	179		0.26	2	2.3	0.01	<5
PQ04S	19/01/2017	1930	136	36.7	410			86	881	65	72	4	602	1.3	0.45	0.7	0.9	0.07	<5
PQ04S	27/04/2017	1950	61	21.5	368			89	865	58	63	3	444	0.9	0.21	1	1.2	0.07	<5
PQ04S	27/07/2017	1940	48	35.6	474			43	698	62	64	5	534	1	0.03	0.4	0.4	<0.01	<5
PQ04S	26/10/2017	1650	234	48	565			23	649	55	56	5	464	1	<0.01	0.5	0.5	0.13	**6**
PQ04S	24/01/2018	1400	110	28.6	504			50	654	69	62	4	437	0.9	0.08	0.5	0.6	0.1	**11**
PQ04S	11/05/2018	1390	78	5.2	580			39	641	71	57	4	417	0.9	0.11	1.2	1.3	0.1	<5
PQ04S	8/08/2018	1550	10	3	590			29	501	70	55	3	405	0.9	0.02	0.2	0.2	0.02	<5
PQ04S	8/11/2018	1650	48	13.7	486			44	570	74	59	3	409	0.9	0.02	0.3	0.3	0.03	<5
PQ04S	26/02/2019	1560			484			90	598	83	62	4	464		0.03	0.2	0.2	0.02	<5
PQ04S	26/06/2019	1160			406			195	206	23	<1	166	253		<0.01	2	2	<0.01	<5
PQ04S	23/07/2019	1690			450			106	756	110	76	4	536		0.44	0.6	1	0.33	<5

PQ04S	22/11/2019	1800	81	41	570	570	<10	110	620	90	66	4.5	450		<0.05	0.6	0.6		<10
PQ04S	5/03/2020	1820	39	14	485	485	<0.1	705	100	102	72	4.8	445	1	0.36	0.2	0.56	0.02	<1
PQ04S	24/06/2020	1600	600	370	700	700	< 10	130	650	110	76	4.9	470	1.2	< 0.05	< 0.2	< 0.2	0.11	**12**
PQ04S	16/10/2020	1200	2	1.4	680	650	26	100	510	69	59	5	430	0.9	0.09	0.2	0.29	< 0.01	< 10
PQ04S	2/02/2021	1600	9.8	1.8	990	960	32	74	460	86	61	5.5	450	1	0.07	0.5	0.57	< 0.01	< 10
PQ04S	21/04/2021	1500	3.2	-	860	790	69	69	440	17	23	4.6	340	1	< 0.05	< 0.2	< 0.2	0.01	-
PQ04S	29/09/2021	1400	1.6	1.1	790	790	< 10	31	430	65	61	16	460	1.1	0.1	< 0.2	< 0.2	< 0.01	< 10
PQ04S	15/12/2021	1500	< 5	1.1	750	720	30	12	460	46	53	15	500	1.1	< 0.05	0.2	0.2	0.01	97
PQ04S	23/02/2022	2900	<5	5.9	710	710	<10	56	380	58	57	6.4	460	1.8	<0.05	0.8	0.8	<0.05	47
PQ04S	6/05/2022	1200	5.2	2	1000	1000	<10	23	390	25	45	5.1	420	1.1	<0.05	<0.2	<0.2	0.01	21
PQ04S	29/09/2022	1520	<5		834	834	<1	51	401	73	49	7	401	1.1	<0.01	0.2	0.2	0.02	<5
PQ04S	21/12/2022	1560	21	1.9	676	676	<1	70	415	75	52	9	452	1.2	0.01	1.1	1.1	<0.01	<5
PQ04S	21/03/2023	1430	12	4.8	820	820	<1	68	373	65	49	7	434	1.2	0.01	0.3	0.3	0.01	<5
PQ04S	21/06/2023	1640	9	4.7	776	776	<1	58	391	68	51	6	455	1.1	0.01	0.3	0.3	0.01	<5
PQ04S	4/12/2023	1640	22	9.7	834	834	<1	26	394	52	50	8	431	1.2	0.06	0.3	0.4	0.01	<5
PQ04S	26/03/2024	1610	24	3.6	838	838	<1	22	400	64	54	12	487	1.2	0.01	0.6	0.6	0.02	<5
PQ04S	19/06/2024	1730	32	5.8	742	742	<1	75	398	66	55	11	466	1.2	0.01	1.4	1.4	0.01	<5
PQ04S	11/09/2024	1750	28	4.3	775	775	<1	102	392	72	55	8	446	1.1	0.19	0.5	0.7	0.01	<5
PQ04S	17/12/2024	1640	25	3.2	766	766	<1	104	424	74	50	8	434	1.1	0.02	0.5	0.5	0.01	<5
PQ04D	19/01/2017	736	18	7.4	102			31	355	38	19	10	184	1.6	0.25	0.2	0.4	0.02	<5
PQ04D	27/04/2017	760	<5	2	93			33	365	33	18	10	148	1.3	0.27	0.1	0.4	0.16	<5
PQ04D	27/07/2017	770	28	17.5	110			31	310	40	22	15	187	1.7	0.29	<0.1	0.3	0.08	<5
PQ04D	26/10/2017	707	9	5.8	122			33	345	33	20	14	181	1.5	0.37	0.2	0.6	0.01	<5
PQ04D	24/01/2018	712	36	22.2	117			30	386	44	25	14	186	1.5	0.38	0.2	0.6	<0.01	<5
PQ04D	11/05/2018	688	38	2.9	117			35	394	39	21	10	181	1.6	0.37	0.2	0.6	0.02	<5
PQ04D	8/08/2018	818	23	16.2	129			34	325	41	24	10	184	1.5	0.37	0.2	0.6	0.02	<5
PQ04D	8/11/2018	761	26	9.4	120			32	369	41	25	11	188	1.6	0.36	0.2	0.6	0.01	<5
PQ04D	26/02/2019	828			110			34	383	45	27	15	218	-	0.52	<0.1	0.5	0.01	<5
PQ05D	19/01/2017	1190	521	420	618			1	391	140	40	24	262	0.3	<0.01	0.6	0.6	0.19	<5
PQ05D	27/04/2017	1110	1490	622	504			4	390	110	32	7	218	0.2	<0.01	0.4	0.4	0.12	<5
PQ05D	27/07/2017	1120	48	98.9	460			7	320	125	35	8	232	0.3	0.02	0.6	0.6	0.08	<5
PQ05D	26/10/2017	984	78	154	529			<1	360	108	33	6	210	0.4	<0.01	<0.1	<0.1	0.02	<5
PQ05D	24/01/2018	992	1310	640	381			35	398	134	51	30	149	0.2	0.03	0.4	0.4	0.04	<5

PQ05D	11/05/2018	1150	3640	1780	478			6	410	137	36	5	184	0.3	0.01	0.6	0.6	0.16	**22**
PQ05D	8/08/2018	1080	42	148	490			16	334	140	43	15	172	0.2	<0.01	<0.1	<0.1	0.02	<5
PQ05D	8/11/2018	1200	183	138	383			5	376	139	42	13	174	0.3	0.04	0.5	0.5	0.18	<5
PQ05D	26/02/2019	1070			356			26	368	122	47	38	162		0.03	<0.1	<0.1	<0.01	<5
PQ05D	12/06/2019	981			332			42	367	133	52	49	132		<0.01	0.4	0.4	<0.01	<5
PQ05D	23/07/2019	1060			282			58	371	122	52	49	138		<0.01	0.6	0.6	0.01	<5
PQ05D	21/11/2019	110	38	31	410	410	<10	41	320	130	49	33	140		<0.05	0.3	0.3		
PQ05D	5/03/2020	1150	43	101	406	406	<0.1	11.6	339	150	46.2	25.1	134	0.22	<0.01	0.15	0.24	<0.02	<1
PQ05D	24/06/2020	1200	50	100	540	540	< 10	10	370	160	55	27	150	< 0.5	< 0.05	0.4	0.4	0.01	< 10
PQ05D	16/10/2020	990	< 1	< 1	250	190	63	55	320	25	40	200	150	< 0.5	0.3	0.8	1.1	< 0.01	**46**
PQ05D	2/02/2021	770	5.9	< 1	380	300	76	62	340	10	38	210	160	0.6	< 0.05	2.1	2.1	< 0.01	< 10
PQ05D	21/04/2021	920	2.4	-	340	240	100	58	360	7.8	43	220	160	< 0.5	0.09	2.1	2.19	< 0.01	< 10
PQ05D	29/09/2021	860	< 1	< 1	330	220	120	54	380	2.4	47	230	170	< 0.5	0.13	2.4	2.53	< 0.01	**11**
PQ05D	15/12/2021	1100	< 5	<1	130	130	< 10	300	350	1.8	41	230	150	< 0.5	0.23	0.9	1.13	< 0.01	<10
PQ05D	23/02/2022	1900	15	68	390	390	<10	7.4	360	150	58	14	130	<0.5	<0.05	0.5	0.5	<0.01	<10
PQ05D	6/05/2022	1300	18	58	480	480	<10	7.4	370	130	53	8	120	<0.5	<0.05	0.3	0.3	<0.01	<10
PQ05D	29/09/2022	1220	23		442	442	<1	5	409	173	53	14	117	0.2	0.04	0.2	0.2	0.02	<5
PQ05D	21/12/2022	1190	39	67.0	417	417	<1	10	448	180	59	23	135	0.3	0.07	0.7	0.8	<0.01	<5
PQ05D	21/03/2023	1160	49	72.2	450	450	<1	12	416	168	59	25	134	0.2	0.14	0.2	0.3	0.01	<5
PQ05D	21/06/2023	1250	26	66.4	426	426	<1	10	416	178	61	16	134	0.2	0.07	0.3	0.4	0.01	<5
PQ05D	4/12/2023	1270	27	66.9	462	462	<1	6	398	174	60	11	123	0.2	0.01	0.4	0.4	0.01	<5
PQ05D	26/03/2024	1220	26	45.9	451	451	<1	7	383	175	57	6	116	0.2	0.02	0.3	0.3	0.01	<5
PQ05D	19/06/2024	1270	30	63.3	414	414	<1	15	397	195	67	8	118	0.3	0.03	0.3	0.3	0.01	<5
PQ05D	11/09/2024	1240	30	25.2	436	436	<1	18	407	184	68	5	111	0.2	0.24	0.4	0.6	0.01	<5
PQ05D	17/12/2024	1290	14	47.4	442	442	<1	13	395	192	60	11	118	0.3	0.03	0.3	0.3	0.01	<5
PQ06D	19/01/2017	1240	26	11.4	406			168	213	27	<1	204	252	0.6	<0.01	1.5	1.5	0.01	<5
PQ06D	27/04/2017	1260	46	24.2	467			178	210	50	<1	166	208	0.5	<0.01	1.9	1.9	0.04	<5
PQ06D	27/07/2017	1130	34	13.4	463			169	172	48	<1	189	253	0.6	<0.01	1.5	1.5	<0.01	<5
PQ06D	26/10/2017	1120	57	22	421			198	190	17	<1	153	238	0.6	<0.01	2	2	0.02	<5
PQ06D	24/01/2018	1110	64	33.4	351			174	211	23	<1	169	261	0.5	0.03	1.7	1.7	0.03	<5
PQ06D	11/05/2018	1040	28	4.2	422			181	218	49	<1	147	235	0.5	<0.01	1.9	1.9	0.02	<5
PQ06D	8/08/2018	1190	157	90.6	469			163	185	23	<1	162	244	0.5	0.03	1.7	1.7	0.02	<5

PQ06D	8/11/2018	1420	112	42.4	366			176	194	4	<1	164	256	0.5	<0.01	2.1	2.1	0.06	<5
PQ06D	26/02/2019	1220			375			189	211	52	<1	158	283	-	0.05	1.3	1.4	<0.01	<5
PQ06D	12/06/2019	1730			506			64	731	105	76	4	480	-	0.05	0.5	0.6	0.02	<5
PQ07D	19/01/2017	937	33	13.7	86			124	331	106	<1	88	166	0.2	<0.01	0.4	0.4	<0.01	<5
PQ07D	27/04/2017	892	24	22.8	150			123	333	79	<1	76	138	0.1	<0.01	0.6	0.6	0.02	<5
PQ07D	27/07/2017	898	54	24.4	124			121	274	93	<1	86	164	0.2	0.02	1.6	1.6	2.1	<5
PQ07D	26/10/2017	994	1210	540	99			140	302	66	<1	81	159	0.2	<0.01	0.6	0.6	0.02	<5
PQ07D	24/01/2018	916	2720	1670	86			116	326	85	<1	81	164	0.2	0.02	0.5	0.5	0.04	<5
PQ07D	11/05/2018																		
PQ07D	8/08/2018	824	52	21.8	119			111	288	77	<1	72	157	0.2	0.02	0.5	0.5	0.06	<5
PQ07D	8/11/2018	652	58	12.6	66			77	319	36	27	55	135	0.1	<0.01	0.4	0.4	<0.01	<5
PQ07D	26/02/2019	482			80			80	220	23	15	65	114		0.07	1.3	1.4	0.09	<5
PQ07D	12/06/2019	472			137			43	115	18	9	76	82		0.67	1.1	1.8	0.02	<5
PQ07D	23/07/2019	625			52			83	284	24	15	74	145		0.04	0.8	0.8	0.02	<5
PQ07D	21/11/2019	760	120	75	85	77	<10	71	270	26	20	62	140		<0.05	0.9	0.9		
PQ07D	5/03/2020	366	89	43.5	142	142	<0.1	37.1	37.6	24.6	10.7	46.9	56.1	0.16	18.5	0.2	18.7	0.04	<1
PQ07D	24/06/2020	440	120	67	180	180	< 10	45	88	38	14	40	51	< 0.5	11	1.6	12.6	0.02	< 10
PQ07D	16/10/2020	250	1.2	1.2	160	150	< 10	26	16	19	12	32	31	< 0.5	1.8	< 0.2	1.8	0.01	< 10
PQ07D	2/02/2021	300	4.6	1.9	220	220	< 10	33	16	24	17	22	26	< 0.5	0.57	1.3	1.87	< 0.01	< 10
PQ07D	21/04/2021	300	4.2	-	160	150	10	36	22	15	8.8	39	35	< 0.5	0.6	0.7	1.3	0.01	< 10
PQ07D	29/09/2021	88	56	2	130	130	< 10	39	19	28	8.9	28	33	< 0.5	0.28	0.6	0.88	0.02	< 10
PQ07D	15/12/2021	240	28	24	160	150	< 10	45	22	17	5.7	30	29	< 0.5	0.14	0.3	0.44	0.01	<10
PQ07D	23/02/2022	220	13	11	44	150	140	41	21	23	5.5	26	34	<0.5	0.08	0.8	0.88	0.02	<10
PQ07D	29/09/2022	280	62		46	136	127		23	24	7	30	38	0.2	0.03	1.1	1.1	0.08	<5
PQ07D	21/12/2022	269	132	73.9	123	123	<1	40	31	25	8	30	39	0.3	0.25	1.7	2.0	<0.01	<5
PQ07D	21/03/2023	268	70	66.7	135	135	<1	46	29	23	7	29	37	0.3	0.02	1.1	1.1	0.01	
PQ07D	21/06/2023	268	35	30.7	127	127	<1	47	26	23	6	29	38	0.3	0.01	0.9	0.9	0.01	
PQ07D	4/12/2023	284	54	57.2	135	135	<1	45	28	24	7	32	40	0.3	0.03	1	1	0.01	
PQ07D	26/03/2024	282	44	37.5	136	136	11	40	33	21	6	33	42	0.2	0.02	0.6	0.7	0.01	<5
PQ07D	19/06/2024	292	8	7.1	128	128	<1	55	34	22	8	35	45	0.3	0.01	0.7	0.9	0.01	<5

PQ07D	11/09/2024	283	26	20.3	134	134	<1	44	31	22	7	34	49	0.3	0.04	1.1	1.2	0.01	<5
PQ07D	17/12/2024	304	5	3.5	134	134	<1	42	35	23	7	34	43	0.3	0.03	1	1	0.01	<5
PQ08D	19/01/2017	2110	37	68.5	402			54	822	240	162	3	143	0.2	<0.01	<0.1	<0.1	<0.01	<5
PQ08D	27/04/2017	2260	23	52.4	371			55	823	217	141	2	113	0.2	<0.01	<0.1	<0.1	<0.01	<5
PQ08D	27/07/2017	2250	35	25	391			38	664	235	145	7	134	0.2	0.03	0.1	0.1	<0.01	<5
PQ08D	26/10/2017	2230	52	58	442			66	745	211	146	3	130	0.3	<0.01	<0.1	<0.1	0.02	<5
PQ08D	24/01/2018	2070	39	60.4	389			61	828	239	147	3	133	0.2	0.05	<0.1	<0.1	<0.01	<5
PQ08D	11/05/2018	1600	20	38.4	405			61	835	242	137	3	124	0.2	<0.01	<0.1	<0.1	0.01	<5
PQ08D	8/08/2018	1890	17	46.7	427			48	673	226	140	4	128	0.2	0.02	<0.1	<0.1	<0.1	<5
PQ08D	8/11/2018	2550	35	61.1	318			43	754	238	139	3	125	0.3	<0.01	<0.1	<0.1	0.02	<5
PQ08D	26/02/2019	2000			364			70	809	239	150	4	137		0.1	<0.1	0.1	0.02	<5
PQ08D	12/06/2019	1860			371			46	767	247	150	5	132		<0.01	0.2	0.2	<0.01	
PQ08D	23/07/2019	1900			333			57	746	234	148	4	135		<0.01	0.3	0.3	0.03	<1
PQ08D	21/11/2019	2800	39	78	430	430	<10	60	1100	230	140	3.4	130		<0.05	2.2	2.2		<1
PQ08D	5/03/2020	1790	45	55.9	326	326	<0.1	46.2	747	224	139	4	124	0.2	<0.05	0.16	0.16	<0.02	<1
PQ08D	24/06/2020	2100	47	92	400	400	< 10	55	770	240	150	5.2	140	< 0.5	0.26	0.6	0.86	0.03	<1
PQ08D	16/10/2020	1600	7.3	35	370	370	< 10	56	680	190	120	21	120	< 0.5	0.21	0.4	0.61	< 0.01	<1
PQ08D	2/02/2021	2700	10	2.3	500	500	< 10	59	790	230	140	12	130	< 0.5	0.08	0.6	0.68	0.01	< 10
PQ08D	21/04/2021	1900	9.8	-	430	430	< 10	58	770	160	150	12	130	< 0.5	< 0.05	3.6	3.6	< 0.01	< 10
PQ08D	29/09/2021	2200	< 1	< 1	430	430	< 10	57	720	240	150	18	140	< 0.5	0.22	< 0.2	0.22	0.11	< 10
PQ08D	15/12/2021	2100	31	40	370	370	< 10	52	800	220	140	16	130	< 0.5	0.16	< 0.2	< 0.2	< 0.01	< 10
PQ08D	23/02/2022	2900	17	53	430	430	<10	61	820	210	160	3	140	<0.5	<0.05	0.5	0.5	<0.05	<10
PQ08D	6/05/2022	1400	15	47	450	450	<10	70	830	230	150	3.4	140	<0.5	<0.05	0.3	0.3	<0.01	<10
PQ08D	29/09/2022	2750	18		405	405	<1	56	852	271	151	3	136	0.2	<0.01	<0.1	<0.1	0.01	<5
PQ08D	21/12/2022	2020	35	54.0	396	396	<1	66	920	265	167	5	150	0.2	0.03	0.3	0.3	<0.01	<5
PQ08D	21/03/2023	1830	38	68.2	416	416	<1	65	864	245	164	4	148	0.2	0.03	0.2	0.2	0.01	<5
PQ08D	21/06/2023	2200	30	72.2	399	399	<1	71	873	248	170	3	150	0.2	0.02	0.1	0.1	0.01	<5
PQ08D	4/12/2023	2200	16	79.4	439	439	<1	63	844	252	175	3	152	0.2	0.01	0.1	0.1	0.01	<5
PQ08D	26/03/2024	2110	14	73.3	429	429	<1	66	857	340	200	3	179	0.2	0.08	0.2	0.3	0.01	<5
PQ08D	19/06/2024	2290	18	68	402	402	<1	67	784	283	186	4	164	0.2	0.06	0.2	0.3	0.01	<5
PQ08D	11/09/2024	2270	25	66.3	431	431	<1	62	832	249	175	4	156	0.2	0.04	0.2	0.2	0.01	<5
PQ08D	17/12/2024	2330	18	54.3	422	422	<1	62	882	245	159	4	144	0.2	0.01	0.5	0.5	0.01	<5

PQ09S	19/01/2017	1830	803	426	472			23	712	180	172	8	153	0.3	4.95	0.9	5.8	0.51	<5
PQ09S	27/04/2017	1870	601	253	443			23	685	160	144	6	122	0.2	3.58	1	4.6	1.14	<5
PQ09S	27/07/2017	1860	150	54.8	476			23	560	166	148	7	139	0.3	7.37	0.3	7.7	<0.01	<5
PQ09S	26/10/2017	1730	76	14.6	456			24	595	146	144	7	131	0.3	6.47	1	7.5	<0.01	<5
PQ09S	24/01/2018	1780	480	297	477			22	650	168	149	7	140	0.3	5.23	0.8	6	2.23	<5
PQ09S	11/05/2018	1280	200	88.4	490			26	653	154	134	5	125	0.3	6.4	0.5	6.9	0.08	<5
PQ09S	8/08/2018	1550	1047	61.4	515			24	531	154	138	6	130	0.3	6.82	0.4	7.2	0.04	<5
PQ09S	8/11/2018	2040	121	68.1	422			23	597	149	145	6	136	0.3	6.57	1.9	8.5	0.09	**5**
PQ09S	26/02/2019	1660			436			29	632	163	152	8	140		6.67	0.3	7	0.01	<5
PQ09S	12/06/2019	1420			470			18	590	170	151	7	136		6.76	1.2	8	0.21	<5
PQ09S	23/07/2019	1500			412			21	585	162	150	7	141		6.3	1.7	8	0.12	<5
PQ09S	21/11/2019	1700	690	430	520	520	<10	37	580	150	140	6.1	130		5.1	<0.2	5.1		<10
PQ09S	5/03/2020	1670	324	140	483	483	<0.1	19.8	538	149	137	6.5	122	0.27	3.67	<0.05	3.48	<0.02	<1
PQ09S	24/06/2020	1500	940	430	600	600	< 10	29	570	170	150	7.1	140	< 0.5	2.5	< 0.2	2.5	0.29	< 10
PQ09D	19/01/2017	1010	382	201	360			25	352	120	95	4	101	0.3	<0.01	<0.1	<0.1	0.07	<5
PQ09D	27/04/2017	868	686	285	425			21	354	118	86	3	82	0.2	<0.01	0.1	0.1	0.37	<5
PQ09D	27/07/2017	1070	117	52.2	432			24	294	118	98	4	105	0.3	0.02	<0.1	<0.1	0.01	<5
PQ09D	26/10/2017	1020	49	29.9	513			20	320	106	89	4	94	0.4	<0.01	0.1	0.1	0.03	<5
PQ09D	24/01/2018	1060	66	42.6	496			9	349	122	93	5	100	0.2	0.03	0.1	0.1	<0.01	<5
PQ09D	11/05/2018	906	59	11	482			30	367	113	91	3	93	0.2	<0.01	<0.1	<0.1	0.06	<5
PQ09D	8/08/2018	970	23	18.3	535			12	301	117	92	7	97	0.2	0.1	0.2	0.3	0.01	<5
PQ09D	8/11/2018	1180	28	18	425			10	326	108	94	6	98	0.3	<0.01	0.3	0.3	0.04	<5
PQ09D	26/02/2019	1110			445			12	337	122	97	10	98		<0.01	<0.1	<0.1	<0.01	<5
PQ09D	12/06/2019	1050			467			10	336	131	101	8	103		<0.01	0.2	0.2	<0.01	<5
PQ09D	23/07/2019	988			397			11	342	123	99	9	101		0.01	0.4	0.4	0.02	<5
PQ09D	21/11/2019	1200	24	14	540	540	<10	19	300	120	94	8.2	99		<0.05	0.3	0.3		<10
PQ09D	5/03/2020	1050	30	6.9	465	465	<0.1	13.1	284	115	87.6	20.5	90.8	0.24	<0.05	0.37	0.37	<0.02	<5
PQ09D	24/06/2020	1100	47	32	490	490	< 10	15	310	120	100	22	110	< 0.5	< 0.05	0.3	0.3	< 0.01	< 10
PQ09D	16/10/2020	920	13	< 1	470	450	13	15	310	110	95	32	94	< 0.5	< 0.05	< 0.2	< 0.2	< 0.01	< 10
PQ09D	2/02/2021	1200	6.6	3.7	620	620	< 10	30	550	100	89	24	100	< 0.5	< 0.05	0.7	0.7	< 0.01	< 10
PQ09D	21/04/2021	1000	2.6	-	530	530	< 10	29	310	110	98	19	99	< 0.5	< 0.05	0.9	0.9	< 0.01	< 10
PQ09D	29/09/2021	910	1.6	< 1	530	530	< 10	22	270	99	86	29	94	< 0.5	< 0.05	0.4	0.4	0.02	< 10

PQ09D	15/12/2021	1100	11	13	540	540	< 10	21	300	88	91	46	96	< 0.5	< 0.05	< 0.2	< 0.2	< 0.01	<10
PQ09D	23/02/2022	1300	22	14	550	550	<10	21	310	100	95	10	96	<0.5	<0.05	1	1	<0.05	<10
PQ09D	6/05/2022	1200	20	6.9	560	560	<10	31	310	92	93	13	96	<0.5	<0.05	0.4	0.4	0.04	<10
PQ09D	29/09/2022	1110	92		509	509	<1	22	354	125	94	9	95	0.2	<0.01	<0.1	<0.1	0.03	<5
PQ09D	21/12/2022	1160	42	25.8	454	454	<1	22	379	132	105	18	111	0.3	0.15	0.6	0.8	<0.01	<5
PQ09D	26/03/2023	1150	109	59.3	519	519	<1	23	364	118	102	23	108	0.2	0.01	0.3	0.3	0.01	<5
PQ09D	21/06/2023	1190	36	35.6	479	479	<1	30	350	114	100	18	110	0.3	0.01	0.3	0.3	0.01	<5
PQ09D	4/12/2024	1200	<5	22.4	519	519	<1	24	333	82	97	60	110	0.2	0.01	0.4	0.4	0.01	<5
PQ09D	26/03/2024	1180	246	179	591	591	<1	27	332	142	116	17	121	0.3	0.01	0.5	0.5	0.01	<5
PQ09D	19/06/2024	1250	217	119	524	524	<1	28	331	43	98	181	127	0.2	0.01	1.1	1.1	0.01	<5
PQ09D	11/09/2024	1240	40	14.5	532	487	45	28	318	7	94	239	126	0.2	0.01	1.1	1.1	0.01	<5
PQ09D	17/12/2024	1330	40	32	527	488	38	36	341	9	87	232	128	0.2	0.01	1	1	0.01	<5