

Year
Ending 4th
May 2025

Annual Review for Badgerys Creek Clay Mine MP10_0014

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Project Name	Badgerys Creek Quarry and Brick Making Project
Report Title	Annual Review
Project Address	225-235 Martin Rd Bradfield (Formerly Badgerys Creek), NSW 2556
Application Number of the Project	10_0014
Mining Authorisations	ML1771
Report Commencement Date	5 th May 2024
Report Completion Date	4 th May 2025
Name of Authorisation Holder	PGH Bricks & Pavers Pty Ltd Trinity 3, Level 5, 39 Delhi Rd, Nth Ryde, NSW 2113
Name of Mine Operator (s)	CSR Pty Limited 39 Delhi Rd Level 6, North Ryde, NSW, 2113, Australia
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Name and Contact Details of the Environmental Representative	Nelma Arancibia CSR Pty Limited 0424 186 127 narancibia@csr.com.au
Name of the Representative of the Authorisation Holder Title	Nelma Arancibia CSR Pty Limited 0424 186 127 narancibia@csr.com.au

Revision Table

Date	Version	Author	Reviewed	Approved
6/10/2025	D0 – draft for client comment	SK	LT/NA	
10/10/2025	F0 – for client review	SK/GT	NA	
15/10/2025	F1 – for client submission	SK/GT	NA	NA

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1 Executive Summary

The CSR Clay Shale mine and associated brickworks located on Martin Road at Bradfield (Formerly Badgerys Creek) NSW has been in shut-down mode since 2012. During the reporting period, ongoing rehabilitation works progressed to allow future industrial / commercial land use. The site operates under MP10_0014 the State Significant consent for a brickworks and clay/shale mine, with modification 6 approved 19/12/2024 allowing importation of tunnel spoil that meets criteria of specific Resource Recovery Order and Resource Recovery Exemption granted by the NSW Environmental Protection Agency (EPA).

The current report period covers 5th May 2024 to 4th May 2025. No extraction activities occurred during the report period however previously stockpiled raw materials were dispatched to other plants in the Sydney metropolitan region, and concrete roof tiles were stored on the site by Monier. The works on the Elizabeth Drive and Martin Road intersection were completed in December 2024, allowing an increase from 120 truck movements per day to 800.

The former Pit 3 has been filled with site materials. Filling of Pit 2 has commenced. Importation of fill materials has commenced during the reporting period.

Transfer of water from Pit 1 to Western Sydney Airport via a purpose-built pipe was undertaken under the supervision of the NRAR but this transfer ceased in January 2025.

There were two non-compliances of the SSD consent conditions:

1. One depositional dust gauge sampling period exceeded the standard sampling period (Schedule 3 Condition 9)
2. The conditions regarding all conditions be complied with is also non-compliant (Schedule 2 Condition 2)

SSD Consent Conditions required to be addressed in this Annual Review are listed in *Table 1*.

Table 1. Annual Review Requirements as per Consent

Schedule No.	Condition No.	Condition	Where Addressed in Report
2	17	PRODUCTION DATA The Applicant must: (a) provide calendar year annual quarry production data to MEG using the standard form for that purpose; and (b) include a copy of this data in the Annual Review.	Section 6.4, Appendix F
3	17A	The Applicant must report on water extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.	Section 9.4.2.2
3	23B	Dewatering Management Plan 23B. The Applicant must prepare a Dewatering Management Plan for the project to the satisfaction of the Secretary. This plan must: (c) include: • details of: * off-site water transfer or discharge arrangements; and * Procedures for monitoring on volumes transferred off-site and reporting on this as part of annual review;	Section 9.4
3	38	Waste The Applicant must: (d) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	Section 9.6
5	12	Annual Review Prior to recommencing quarrying operations or Fill import, and annually thereafter, the Applicant must submit a review to the Department reviewing	This report

Schedule No.	Condition No.	Condition	Where Addressed in Report
		the environmental performance of the development to the satisfaction of the Secretary. This review must: (a) describe the development (including any progressive 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, which includes a comparison of these results against the: • relevant statutory requirements, limits or performance measures/criteria; • requirements of any plan or program required under this consent; • monitoring results of previous years; and • relevant predictions in the documents listed in condition 3 of Schedule 2; (c) evaluate and report on: • the effectiveness of the air quality and noise management systems; and • compliance with the performance measures, criteria and operating conditions in this consent. (d) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence; (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 current calendar year to improve the environmental performance of the development. The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 8 of Schedule 5) and any interested person upon request.	

2 Scope

This report is the Annual Review (MP10_0014) for the Badgerys Creek Clay Shale Mine located at 235 Martin Rd, Bradfield, NSW 2555, in the Liverpool Council Government Area. The site is approximately 17km south of Penrith, as presented in [Figure One](#). The site includes water-filled voids, a former mine, and demolished brickworks.

This Report was prepared in accordance with Project Approval conditions MP10_0014 consolidated consent for modification 6. The compliance statuses of the Mining Lease (ML - [Appendix B](#)), Environmental Protection Licence (EPL - [Appendix C](#)), and Water Access Licence (WAL - [Appendix D](#)) has not been assessed during the preparation of this Annual Review.

2.1 MINE CONTACTS

Table 2. Contact Details

Aspect	Mine and Rehabilitation Manager
Name	Nelma Arancibia
Company	CSR Pty Limited
Address	39 Delhi Road Level 6, North Ryde, NSW, 2113
Mobile	0424 186 127
Phone	02 9964 1305
Email	narancibia@csr.com.au

2.2 HISTORY OF OPERATIONS

The site is located at 235 Martin Road, Bradfield, accessible at the end of Martin Road off Elizabeth Drive. Boral Bricks Pty Limited (Boral) owned and operated the Badgerys Creek Quarry and Brick Making Facility at Badgerys Creek for over 30 years.

On 27 September 2011, project approval was issued under Section 75J of the EP&A Act for the ongoing production of bricks and the expansion of the existing quarrying operations. Due to uncertain economic conditions and a downturn in residential housing activity, the site was 'mothballed' effective from 30 March 2012, in 2016 PGH Bricks through its parent company CSR purchased the site.

2.2.1 Modification 1

As many of the conditions of consent were not relevant during the shutdown, Boral applied to modify the Project Approval under Section 75W of the EP&A Act. Modification application (10_0014 Mod 1) requested that post-March 2012 activities be limited to:

- minor maintenance and inspection (e.g. water management, equipment testing);
- operation of the retail display facility; and
- irregular and occasional dispatch of bricks from the inventory remaining on-site.

In 2015, Boral and CSR formed a joint venture brick business called Boral CSR Bricks Pty Ltd. The assets held by the respective companies were transferred into the joint venture. At the end of October 2016, CSR acquired Boral's share of the brick business and with it, the Badgerys Creek Quarry and Brick Making Facility.

2.2.2 Modification 2

The 2011 Project Approval did not allow for the exportation of material extracted on-site, which was required due to recent and forecasted closure of many quarries in the region. Also, although the 2011 Project Approval allowed for

the storage of finished brick products in the hard stand storage yard, to the east of the brick factory, this storage area would not be used for the storage of bricks manufactured at the site until planning approval has been granted for the upgrade of the existing brick factory and the upgrade has been completed (Modification 3). In the interim CSR urgently required additional finished product storage capacity in the greater Sydney region and therefore proposed to make use of this site for the temporary storage of finished building products.

As the ability to export clay from the Badgerys Creek site and temporarily store finished building products was required as a matter of urgency, CSR lodged a separate modification application (Modification 2) under Section 75W of the EP&A Act for these two activities. CSR obtained planning approval for Modification 2 from DP&E on 5 May 2018.

2.2.3 Modification 3

A review of the business needs forecast an increase in required production at Badgerys Creek. An Environmental Assessment was submitted to propose an:

- Increase in brick production;
- Increase in importation of raw materials;
- Allow continued extraction from Pit 3;
- Increase in laden truck movements;
- And an increase in operational hours.

2.2.4 Modification 4

To address stakeholder requests to facilitate future development associated with the Aerotropolis rezoning of the area due to the construction and development of the Western Sydney Airport (WSA), CSR proposed Modification 4, which broadly consists of dewatering existing voids, continuing the extraction of brick making materials and progressively back filling with Virgin Excavated Natural Materials (VENM) to advance a site able to be used for future industrial development. This modification included changes to the 30-year quarry staging plans and an increase in laden truck movements and hours (for VENM only).

CSR obtained planning approval for modifications 3 and 4 in August 2020.

2.2.5 Modification 5

With the high demand for fill material within the Sydney Metropolitan region due to the number of major infrastructure projects underway, Virgin Excavated Natural Material (VENM) was scarcer than originally anticipated. To allow some flexibility to continue with the project, modification 5 was submitted to allow importation of Excavated Natural Material (ENM) as fill, as well as VENM.

The condition regarding receival storage and dispatch of brickmaking materials was also modified to remove the end date.

This modification was approved in January 2022.

2.2.6 Modification 6

To allow for importation of fill material from construction projects in the Sydney basin that satisfy the specifications of the excavated natural material exemption 2014, Modification 6 was submitted to modify definitions of fill used in previous Modifications.

The modification was approved December 2024.

Fill is defined in the Modification 6 consent as: "Includes VENM, ENM and soils in the form of tunnel spoil that meet the requirements of a specific resource recovery order and resource recovery exemption granted by the NSW EPA and approved by the EPA to be applied to land within Lot 2 DP1278780."

3 Statement of Compliance

Table 3. Statement of Compliance

Were all conditions of the relevant approvals(s) complied with?	
Major Project Approval MP10_0014 (Mod 6)	Yes

A full list of conditions and compliance status is included in [Appendix E](#).

Table 4. Compliance Status Key

Status	Description
Compliant	The proponent has collected sufficient verifiable evidence to demonstrate that all elements of the requirement have been complied with.
Non-Compliant	The proponent has identified a non-compliance with one or more elements of the requirements.
Not Triggered	A requirement has an activation or timing trigger that has not been met at the phase of the development when the compliance assessment is undertaken, therefore an assessment of compliance is not relevant.

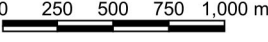
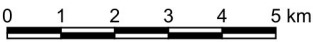
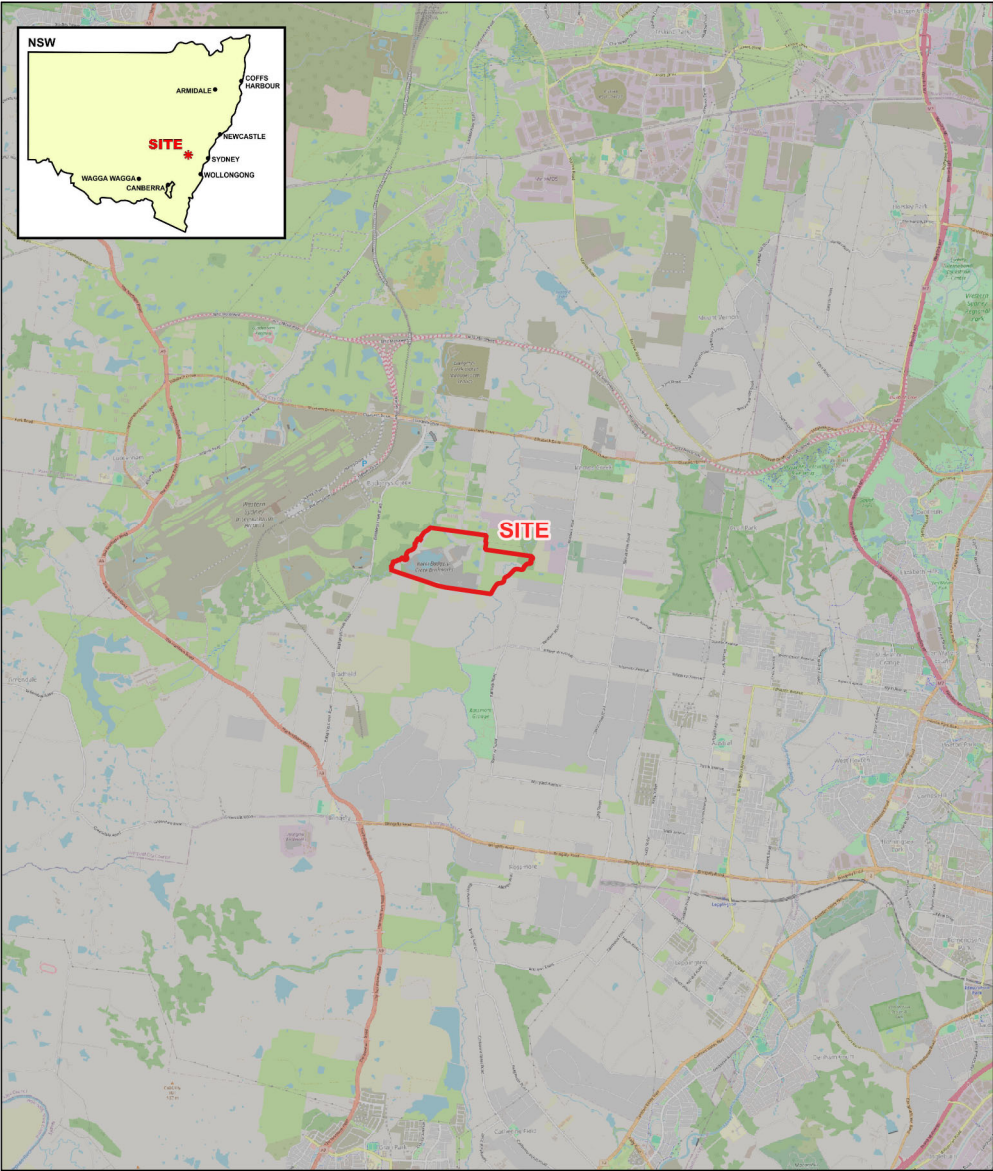
4 Actions Required from Previous Reports

No actions were required from the previous Annual Review.

Plan of:	Annual Review for Badgerys Creek Clay/Shale Mine 2025 - Site Location	Location:	235 Martin Road, Bradfield, NSW	Source:	Google OpenStreetMap & nearmap - Image Date 01/06/2025 Zone MGA 56	Plan By:	SK/JD
Figure:	ONE	Council:	Liverpool City Council	Survey:	NSW Clip & Ship / Minview	Project Manager:	LT
Version/Date:	V0 09/09/2025	Tenure:	ML1771 (Act 1992)	Projection:	GDA2020/MGA Zone 56 EPSG:7856	Office:	Thornton
Our Ref:	12758_BB_AR2025_Q001_V0_F1	Client:	CSR Group Property Ltd	Contour Interval:	Not Applicable		



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Legend

Property Boundary

Western Sydney Airport

Authority Boundary (ML1771 (Act 1992))

Plan of: Annual Review for Badgerys Creek Clay/Shale Mine 2025 - Site Layout

Figure: TWO

Version/Date: V0 15/10/2025

Our Ref: 12758_BB_AR2025_Q002_V1_F2

Location: 235 Martin Road, Bradfield, NSW

Council: Liverpool City Council

Tenure: ML 1771 (Act 1992)

Client: CSR Group Property Ltd

Source: nearmap - Image Date 01/06/2025 Zone MGA 56 & Sixmaps Spatial Data

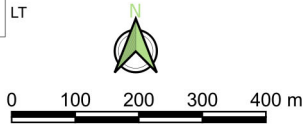
Survey: Client Supplied & ELVIS Spatial Data

Projection: GDA2020/MGA Zone 56 EPSG:7856

Contour Interval: 1m

Plan By: SK/JD

Project Manager: LT



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Legend

Feature/Domain

- Property Boundary
- Western Sydney Airport
- Lot
- 60m Creek Buffer

Mining Tenement

- ML1771 (Act 1992)

Monitoring Locations

- Depositional Dust Monitoring Location
- Groundwater Monitoring Location
- HVAS Monitoring Location
- Noise Monitoring Location

Other Features

- Discharge Point
- Creek/Major Drainage Line
- Farm Dam
- 5m
- 1m
- Surface Water Monitoring Location
- Weather Station

5 Consents, Leases and Licences

5.1 PROJECT APPROVAL

Badgerys Creek Quarry and Brick Making Project received project approval from the Minister for Planning and Infrastructure in 2011 for application number 10_0014. The approval was modified most recently in December 2024 and conditions are included in [Appendix A](#).

Table 5. Development Approvals

No.	Date Approved	Expires
10_0014 Mod 6	19 th December 2024	27 th September 2031 (quarrying activities)

5.2 LAND OWNERSHIP AND LAND USE

The site is freehold land with property descriptions listed below and shown on [Figure Two](#).

- Lots 54-56, DP 3050; and
- Lots 1-3, DP 1278780

5.3 ENVIRONMENTAL PROTECTION AUTHORITY

Environmental Protection Licence Number 684 has been issued under the Protection of the Environment Operations Act (PoEOA) (included in [Appendix C](#)) and covers ceramic works, mining for minerals and the import of fill materials. The licence was varied 15th April 2025 to allow Pit water discharge to Badgerys Creek.

6 Activities During the Reporting Period

6.1 EXPLORATION

There were no exploration activities during the report period.

6.2 CONSTRUCTION

No construction activities within the project footprint have occurred during the report period. The intersection upgrade of Elizabeth Drive and Martin Road was completed on 19 December 2024.

6.3 TRUCK MOVEMENTS AND TONNAGES

The consent has limits on extraction, production, receipt and dispatch volumes per calendar year and on total truck movements. During the period truck movements include:

- Dispatch of stored clay for brickmaking and fill purposes on other sites;
- Import of fill materials for rehabilitation;
- Import of finished building products on site by Monier;
- Export of finished building products by Monier;
- Miscellaneous, such as water carts and maintenance vehicles.

The Development is in Phase 1 as dewatering is not yet complete.

Site project managers advise there were no truck movement exceedances.

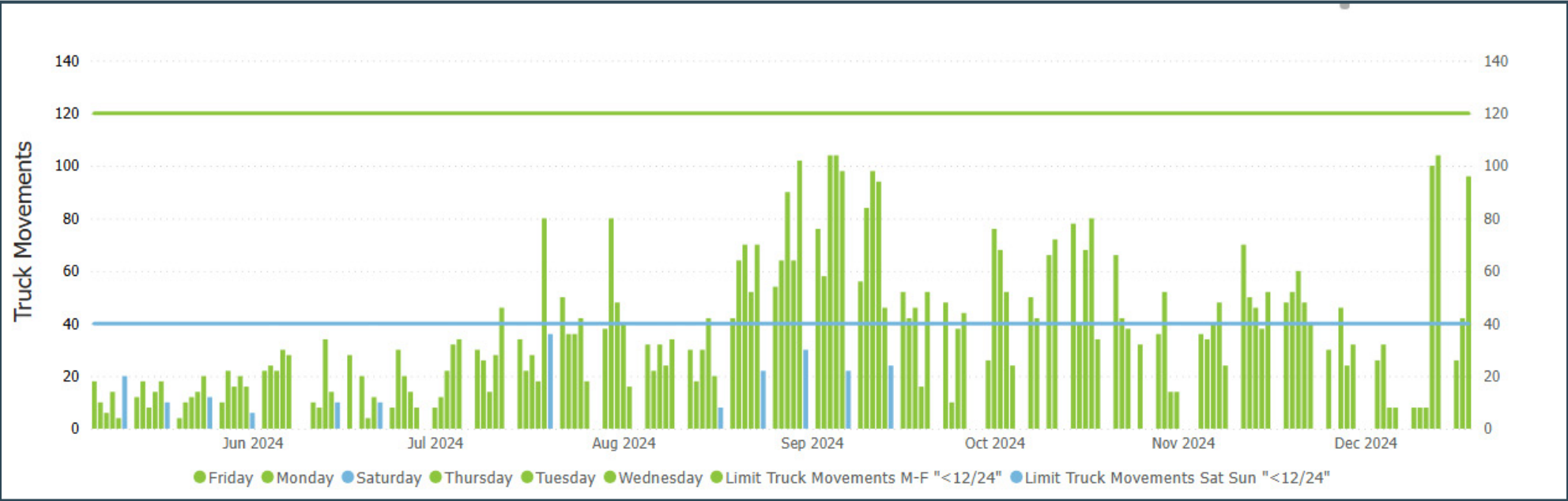
Table 6. Truck Movements in the Report Period

Transport Route Stage	Development Phase	Day	Total truck movements Sched 2 Cond 12	Max Actual Truck Movements per day in Report Period	Compliant
Prior to the upgrade of the Martin Rd Elizabeth Dr Intersection	1, 2, and 3	Monday to Friday	120	104 04/09/2024, 05/09/2024 and 13/12/2024	Yes
		Saturday	40	36 20/07/2024	Yes
		Sunday	40	0	Yes
Following Completion to the upgrade of the Martin Rd Elizabeth Dr Intersection on 19th December 2024	1, 2, and 3	Monday to Friday	800	416 12/03/2025	Yes
		Saturday	358	192 15/02/2025	Yes
		Sunday	200	0	Yes

6.3.1 Measures Put in Place to Prevent Exceedances

A heavy vehicle automated monitoring system was installed and commissioned at the development. The system is installed at the main central access gate into the site to ensure all heavy vehicle movements are recorded, as vehicles drive across the laser (which is positioned at a height to exclude light vehicles) the interruption registers a movement and record a timestamp. This occurs on both the entry and exit lanes. Once the truck numbers are approaching the daily limit, a notification is sent to the site manager noting that the site is approaching the daily limit, then communication is sent to the site contractor noting that traffic is to cease (incoming or outgoing heavy vehicle movements) when limits is reached. When the daily limit has been reached, a red light will be activated, and the main access gate will automatically close. This lockout will remain until the next day when heavy vehicle movements restarts.

Graph 1. Total Truck Movements During Prior to Intersection Upgrade



Graph 2. Total Truck Movements During After Intersection Upgrade

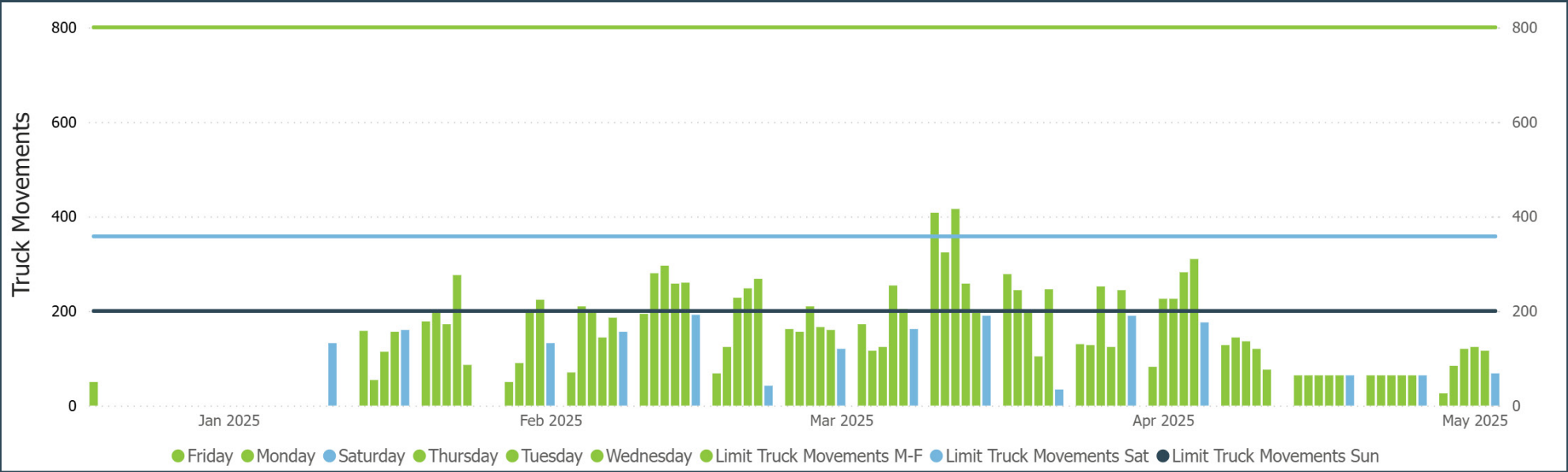


Table 7. Extraction, Production and Material Movements in the Report Period

Activity	Limit (Tonnes per Calendar Year)	Actual Tonnages in Report Period	Compliant
Extraction from Pit 3	420,000	0	Yes
Receive raw materials for brickmaking	215,000 (Phase 1)	0	Yes
Dispatch raw materials	275,000	33,493	Yes
Brick Production	300,000	0	Yes
Dispatch finished building products	330,000	41,794	Yes

6.4 MINING OPERATIONS

No mining was undertaken during the reporting period. Schedule 2 Condition 17(b) of the consent requires the annual quarry production data as submitted to Department Regional NSW - Mining, Exploration and Geoscience (MEG) to be included in the Annual Review, see [Appendix F](#).

Phase 1 is expected to take more than 5 years, and includes the following activities:

- Dewatering of Pits 2 and 3 to Pit 1
- Dewatering of Pit 1, with use of water for:
 - Onsite processes under WAL 24346
 - Transfer to Western Sydney Airport under agreement (ceased January 2025)
 - Discharge to local creeks under EPL 684
 - Onsite irrigation
- Importation of Virgin Excavated Natural Materials (VENM), Excavated Natural Material (ENM) or Tunnel Spoil to fill Pits 1 and 2 (in progress)
- Progressive backfilling of Pit 3 with VENM/ENM (completed)
- Construction activities associated with planned rehabilitation works.

Operations on the site have occurred in compliance with the hours shown in [Table 8](#).

Table 8. Hours of Operation

Activity	Days	Permissible Hours
Quarrying operations (excluding truck arrival, loading and dispatch)	Monday to Saturday Sundays or Public Holidays	7:00 am to 6:00 pm At no time
Brickmaking Activities	Monday to Sunday	24 hours
Raw materials truck arrival and dispatch	Monday to Friday Saturday Sunday and Public Holidays	6:00 am to 10:00 pm 6:00 am to 6:00 pm At no time
Finished Products truck arrival and dispatch	Monday to Friday Saturday Sunday and Public Holidays	5:00 am to 10:00 pm 6:00 am to 6:00 pm At no time

Activity	Days	Permissible Hours
Fill importation truck arrival and dispatch	Monday to Friday Saturday Sunday Public Holidays	7:00 am to 6:00 pm 7:00 am to 6:00 pm 9:00 am to 6:00 pm At no time
Cash Sales	Monday to Friday Saturday Sunday and Public Holidays	6:00 am to 6:00 pm 6:00 am to 6:00 pm At no time
Sales Selection and Display Centre	Monday to Sunday	8:00 am to 5:00 pm
Maintenance	At any time provided activities are not audible at a privately-owned residence outside of permissible hours for quarrying operations	

6.5 MAINTENANCE

Maintenance activities on the site this report period included contractors accessing the site to collect samples for environmental monitoring.

7 Incidents

No incidents have been recorded resulting from project-related activities during the reporting period. No further action is required.

8 Complaints

Two complaints were recorded during the reporting period. Details and results are listed in *Table 9*. Both complaints have been closed out.

Table 9. Complaints Register

Complainant	Nature of complaint (date, time, duration, location)	Comments made by complainant	Action Taken by CSR
Department of Planning – Senior Compliance Officer	Road investigation by DPIE 20/01/2025	DPIE received a community enquiry related to dilapidation of Lawson road due to truck movements and requested information from CSR, CSR responded 30/01/2025 with dilapidation report prior to road diversion works.	CSR issued information to DPIE and no further communication received from DPIE.
Neighbouring resident	11/02/2025 2:46pm	Water run-off into neighbour's property, and trucks speeding around the bend	Dewater farm dam following excessive rainfall, ensuring no sprinklers are on, Martin Road is a 60km road but additional toolbox added with contractor to slow down around bends.

9 Environmental Management and Performance

The location of monitoring points is provided on [Figure Two](#).

9.1 CLIMATE SUMMARY

A weather station was installed in December 2016.

9.1.1 Relevant Statutory Requirements and Performance Criteria

Consent conditions require that meteorological monitoring is undertaken primarily to determine when noise criteria apply. Monitoring is also required in order to minimise air quality impacts under adverse conditions. More specifically Condition 14 of Schedule 3 requires meteorological monitoring. The monitoring station must comply with the following guidelines and policies.

- Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and
- Capable of continuous measurement of stability class in accordance with the NSW Industrial Noise Policy.

9.1.2 Climate Monitoring Trends

The report period has been warmer than average, and rainfall has been lower.

Table 10. Weather Station Data During Report Period

Month	Cal Year	Rain (mm)	Average of Temperature (°C)	Min of Temperature	Max of Temperature	Average of Humidity
May	2024	66	13.9	2.8	23.5	80.1
June	2024	35	10.7	0.2	20.2	77.2
July	2024	3	11.1	1.2	23.6	71.9
August	2024	0	14.3	1.0	29.1	70.0
September	2024	0	15.4	1.7	28.6	60.2
October	2024	0	17.1	6.4	30.1	69.2
November	2024	24	21.1	12.6	37.2	72.6
December	2024	26	23.1	11.5	40.0	68.5
January	2025	75	22.2	13.4	41.8	72.2
February	2025	61	22.7	10.7	38.0	72.5
March	2025	74	22.0	11.5	36.9	77.6
April	2025	44	18.5	9.3	29.6	74.1
May	2025	0	15.0	8.3	22.1	75.5
Total		408	17.7	0.2	41.8	72.1

Graph 3. Weather Trends – Precipitation



Graph 4. Weather Trends Temperature



9.2 NOISE

There are consent conditions requiring compliance with noise levels during quarrying operations and storage yard activities. Since none of these activities have occurred, these conditions are not triggered, and no noise monitoring is strictly required. Notwithstanding this, noise monitoring has commenced in accordance with the approved Noise Management Plan (NMP).

Noise Monitoring was undertaken in May, September and December 2024, and April 2025 (see [Appendix G](#)). The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions. The results for Road Traffic noise levels complied with the relevant noise criteria.

The noise management system is effective for the current stage of the operation.

9.3 AIR QUALITY

9.3.1 Performance Criteria

The consent and Air Quality Management Plan specifies the following Air Quality Criteria to be met at any residence on privately owned land:

Table 11. Air Quality Criteria

Parameter	Criteria [^]	Units	Averaging Period	Source
Total Suspended Particulates (TSP)	90*	µg/m ³	Annual	Sched 3 Cond 9
PM₁₀	50 [#]	µg/m ³	24 hours	Sched 3 Cond 9
PM₁₀	30*	µg/m ³	Annual	Sched 3 Cond 9
Insoluble Solids (Deposited Dust)	4*	g/m ² /month	Annual	Sched 3 Cond 9
Insoluble Solids (Deposited Dust)	2 [#]	g/m ² /month	Annual	Sched 3 Cond 9

* Cumulative impact (i.e. increase in concentrations due to the project plus background concentrations due to all other sources).

[#] Incremental impact (i.e. increase in concentrations due to the project alone, with zero allowable exceedances of the criteria over the life of the project).

[^]Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consultation with EPA.

Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, *AS/NZS3580.10.1: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method*.

9.3.2 Predictions

An air quality assessment undertaken for the modified project by specialist air quality consultants (Todoroski Air Sciences, Feb 2019) predicts no exceedances of relevant criteria during Pit 3 extraction operations.

The following table summarises the predictions made for the Pit 3 extraction operations at the closest sensitive receptors.

Table 12. Air Quality Predictions

Sensitive Receptor	Nearest Air Quality Monitoring Location	PM2.5 (µg/m3)	PM10 (µg/m3)	TSP (µg/m3)	Insoluble Solids (g/m2/month)
R5	D4, HVAS	7.3	17.7	62.9	2.8
R9	D1	7.4	18.3	65.5	2.9
R12a	D2	7.1	17	60.6	2.7

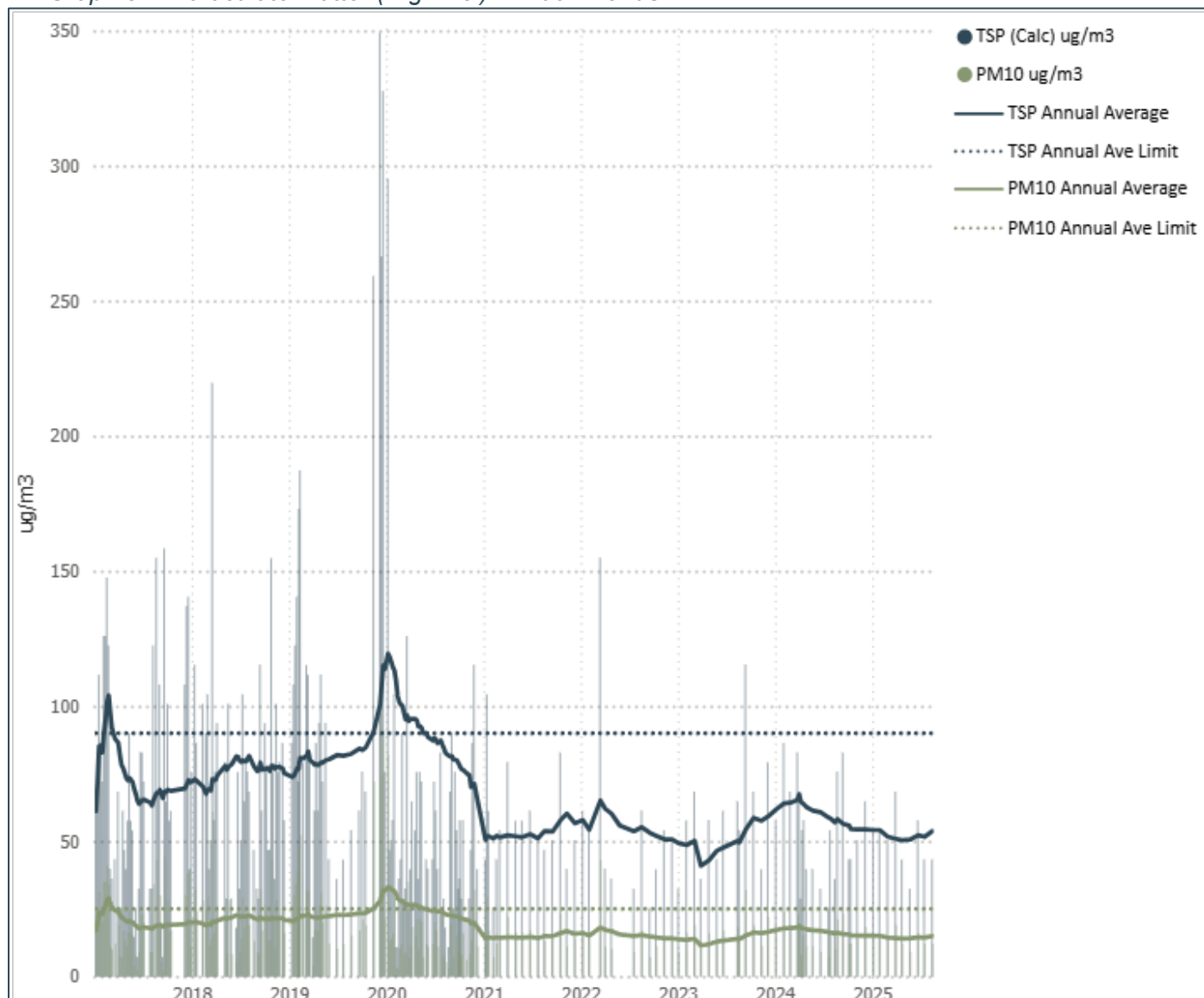
9.3.3 Monitoring Results

Monitoring results obtained this report period are from the High Volume Air Sampler at location shown on [Figure Two](#). A Dust Trax is also used for instantaneous readings on site during site operations.

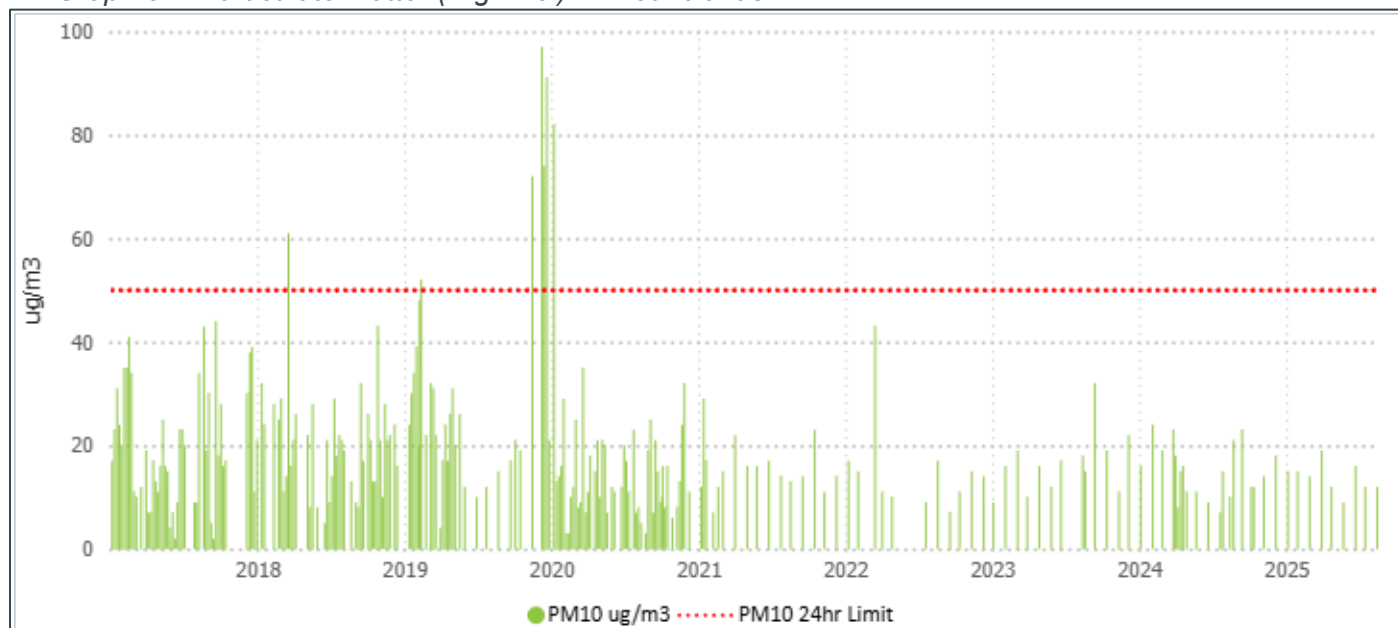
9.3.3.1 Particulate Matter

A High Volume Air Sampler with a PM₁₀ inlet was installed on the site in December 2016. There were no exceedances of either the 24 hour or Annual Average Particulate Matter less than 10 microns (PM₁₀) criteria within the report period. Total Suspended Particulates (TSP) is calculated from the PM₁₀ using the ratio described in the Air Quality Management Plan (AQMP) and trends are shown in the graphs below. This calculated result did not exceed the Annual Average limit for TSP in this report period. Particulate Matter is also measured in “real time” using a portable Dustrax instrument. This instrument gives an output every minute for PM Total, PM 2.5 and PM 10 and is monitored for compliance by the site environmental manager.

Graph 5. Particulate Matter (High Vol) Annual Trends



Graph 6. Particulate Matter (High Vol) 24 hour trends



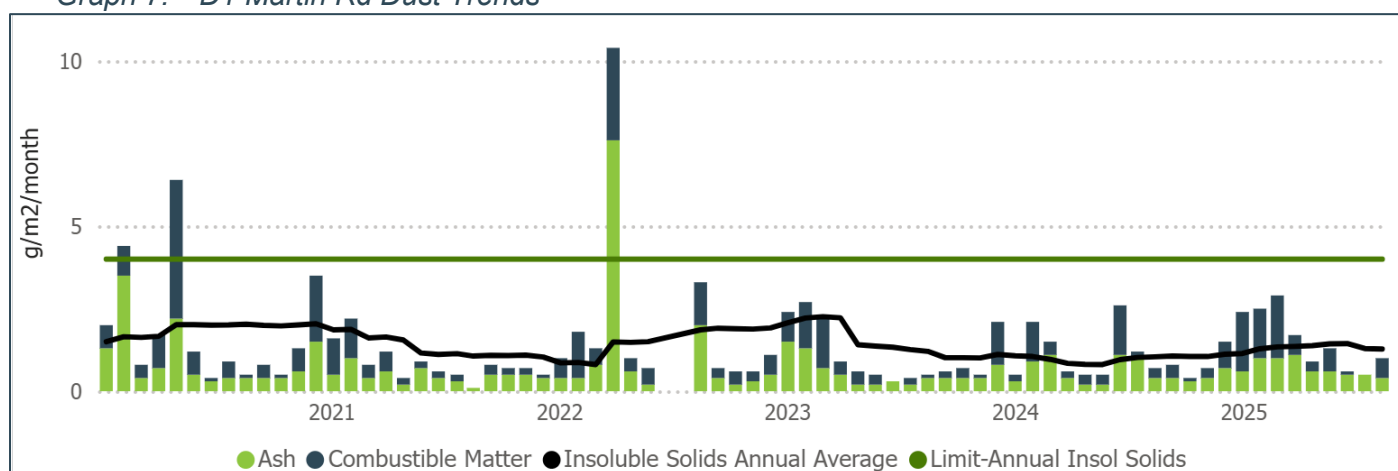
9.3.3.2 Depositional Dust Gauge Monitoring

Air-borne dust is monitored using static depositional dust gauges. Results for four dust gauges (locations shown in [Figure Two](#)) up to May 2025 are summarised below. Trends are shown on the following graphs and high results summarised in [Table 14](#). There were no exceedances of the required limits in the report period.

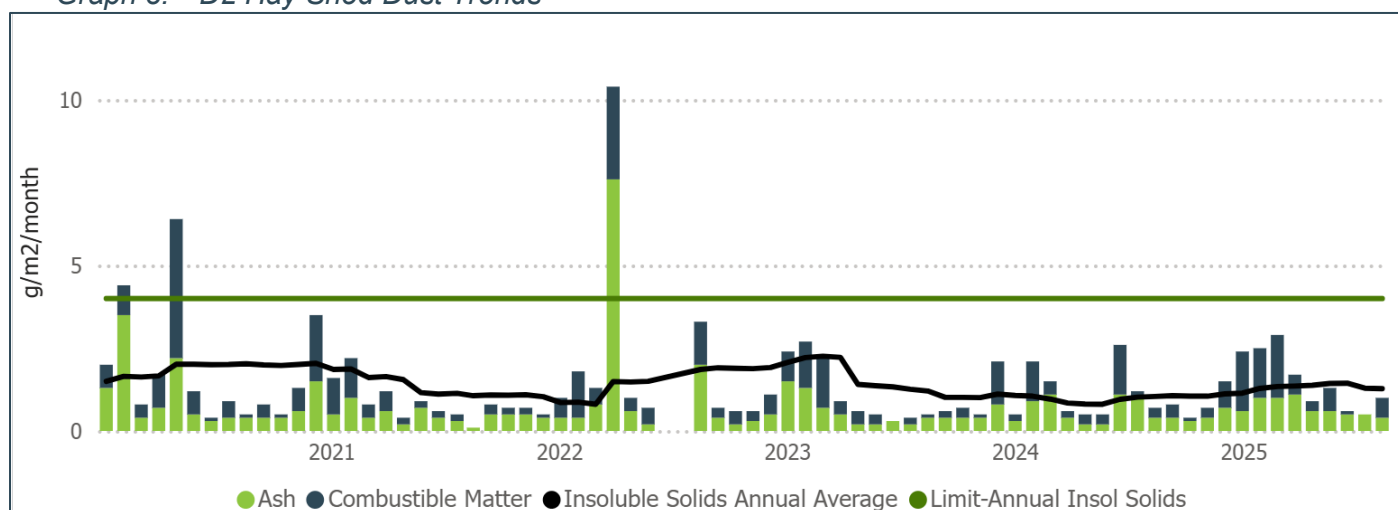
Table 13. Insoluble Solids Annual Averages at Report Period End

Location	Insoluble Solids Annual Average	Limit-Annual Insol Solids
D1 Martin Rd - Near Resident	1.4	4
D2 Hay Shed	1.4	4
D3 Bundwall Near Inghams	2.1	4
D4 Old House	3.7	4

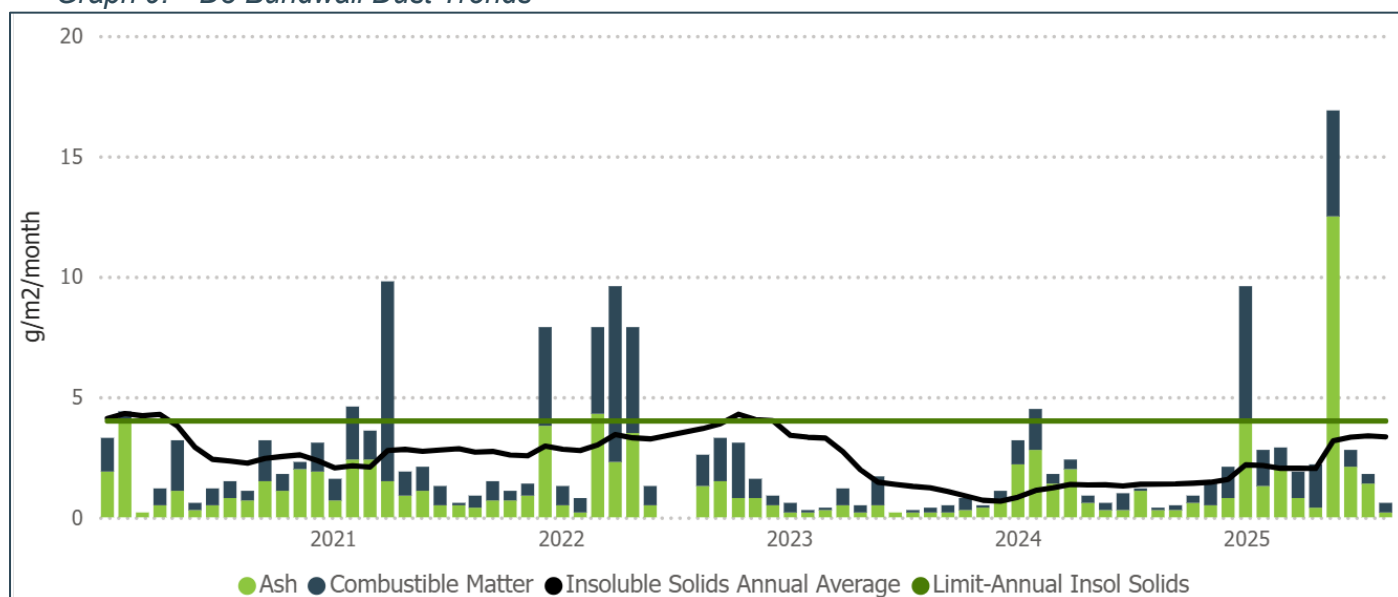
Graph 7. D1 Martin Rd Dust Trends



Graph 8. D2 Hay Shed Dust Trends



Graph 9. D3 Bundwall Dust Trends



D4 Old House dust gauge was sampling for two 28 day cycles between June and August 2024. This is non-compliant with the sampling method in Schedule 3 Condition 9; however there was no material harm as a result of the incident and results did not exceed the insoluble solids annual average.

Graph 10. D4 Old House

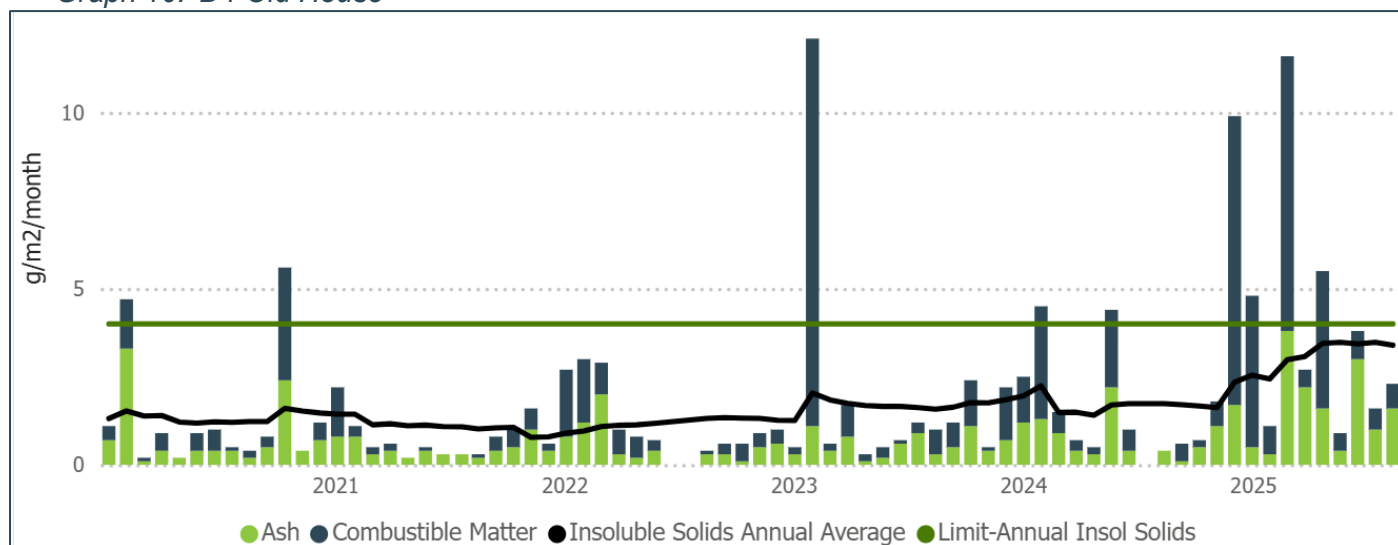


Table 14. Monthly Depositional Dust High Results

Date On	Date Sampled	Location	Insoluble Solids	Sampling Comments
23/04/24	21/05/24	D4 Old House	4.4	Insects
5/11/24	3/12/24	D4 Old House	9.9	Major vegetation, beetles, algae
3/12/24	31/12/24	D3 Bundwall Near Inghams	9.6	Dry. Major beetles
3/12/24	31/12/24	D4 Old House	4.8	Major Beetles
31/12/24	28/01/25	D2 Hay Shed	5.9	Major seeds, owl pellet
28/01/25	25/02/25	D4 Old House	11.6	Major insects & algae
25/03/25	22/04/25	D4 Old House	5.5	Organic matter, owl pellet blocking funnel

NOTE: These are not non-compliances as the Annual Averages were not exceeded.

9.3.4 Dust Trax Instantaneous Particulate Matter

Todoroski Air Sciences prepared monthly reports on behalf of CSR to provide a summary of the available meteorological and air quality data collected at the Badgerys Creek Quarry and Brick Making Project weather station and dust monitors. The monthly reports are included in *Appendix G*. The reviews indicate that “the Badgerys Creek weather station recorded sensible measurements and that the instruments were recording appropriately. Based on the available data, there were no recorded days above the 24-hour average PM10 and/or PM2.5 criterion of 25µg/m3 and 50µg/m3 at the monitors during most of 2024-2025. It is to be noted that there were some issues with the monitors during [every month reported] that resulted in nil or low data capture.

The April 2025 report states: “There was one day above the PM2.5 criterion of 25µg/m3 during April 2025, however the site was not operational during this day, and therefore could not have contributed to the elevated level.” An investigation explains that the site was non-operational, and for the duration of the high value the wind was predominantly from an off-site location, indicating an external source of the high result.

9.3.5 Effectiveness of Air Quality Management System

There have been no exceedances of the required air monitoring criteria this report period. The effectiveness of the air quality system is adequate for the activities undertaken in the report period.

9.4 SURFACE WATER

9.4.1 Performance Criteria and Predictions

9.4.1.1 EPL Criteria

The EPL requires discharge water to be monitoring continuously during discharge via inline instrumentation for Electrical Conductivity, pH and Turbidity, see [Table 15](#). Dissolved Aluminium is required to be tested monthly if discharging.

Table 15. EPL Water Discharge Criteria

EPA ID	Type	Location Description	Pollutant	Limit
3	Discharge to waters and water quality monitoring	Outlet from Sediment Basin B as described in 'Water Pollution Impact Assessment for Discharge of Stormwater Runoff from Disturbed Areas at PGH Badgerys Creek (Version 2)', PGH Bricks, 04/02/2021	pH Turbidity Conductivity Diss Aluminium	6.5 – 8.5 50 NTU <0.055mg/L

9.4.1.2 Surface Water Management Plan Criteria

From the Surface Water Management Plan (SWMP), baseline criteria for assessment of performance of the Site with regard to the on-site water management system as well as potential off-site impacts on water quality and stream health are shown in [Table 16](#). The off-site performance criteria and trigger values for water quality and stream health reflect the degraded environmental values in Badgerys Creek (AECOM, 2010). There were no specific water quality predictions made in the approval documents.

Table 16. Surface Water Trigger Levels and Performance Criteria

Aspect	Trigger Level	Performance Criteria
Water Management System		
Industrial Water Use	Trigger levels for industrial water use in accordance with brick plant process design (to be developed).	Industrial process water meets processing plant design requirements (to be developed).

Aspect	Trigger Level	Performance Criteria
Discharge	pH: 6.5 – 8.5 Turbidity: 50 NTU Electrical Conductivity: Reported only Dissolved Aluminium: 0.055mg/L	Discharged water meets EPL criteria.
Creeks and Other Water Bodies		
Water Quality in Creeks**	Total Phosphorus: 1.0mg/L Filterable reactive phosphate: 0.35mg/L Oxides of nitrogen: 0.18mg/L Ammonium: 0.48mg/L Dissolved Oxygen: 85 – 110 % saturation Total Nitrogen: 8.7mg/L pH: 6.5 – 8.0 Conductivity: 3,200µS/cm	No exceedance of the 95% confidence interval for baseline monitoring results for Badgerys Creek.
Stream Health	Visual baseline to be established in close vicinity to the following points: • Confluence of Badgerys Creek tributary and Badgerys Creek; • 100 m upstream of the confluence point of Badgerys Creek tributary and Badgerys Creek • 100 m downstream of the confluence point of Badgerys Creek tributary and Badgerys Creek Establish transect for assessment of changes to channel morphology, including geo-referenced photo point monitoring at each of the three above points Condition assessment of riparian vegetation to establish baseline photo point monitoring at each of the three above points	No significant variation from baseline identified in biannual spring and no significant observed variation from baseline vegetation condition identified in biannual spring and autumn monitoring

*Note: Values are extracted from ANZECC (2000) default trigger values for slightly disturbed ecosystems in South-East Australia.)

** Value derived from baseline monitoring data for the 95% confidence interval for expected conductivity results (see the SWMP for details).

9.4.2 Monitoring Results

9.4.2.1 Discharges

Discharge of water occurred in July 2024. A sample was tested for Aluminium and all discharge met criteria. Approximately 790ML of pit water was utilised in irrigation during the reporting period.

9.4.2.2 Water Extracted

Schedule 2 Condition 17A requires that all water extracted from the site either direct or indirect must be reported in the Annual Review. Procedures for monitoring on volumes transferred off-site are required to be included in the Annual Review under Schedule 3 Condition 23B.

The site reports the following water was transferred to the Western Sydney Airport under the Enforceable Undertaking, as reported to NRAR every 6 months.

Table 17. Water Transfer to WSA Volumes

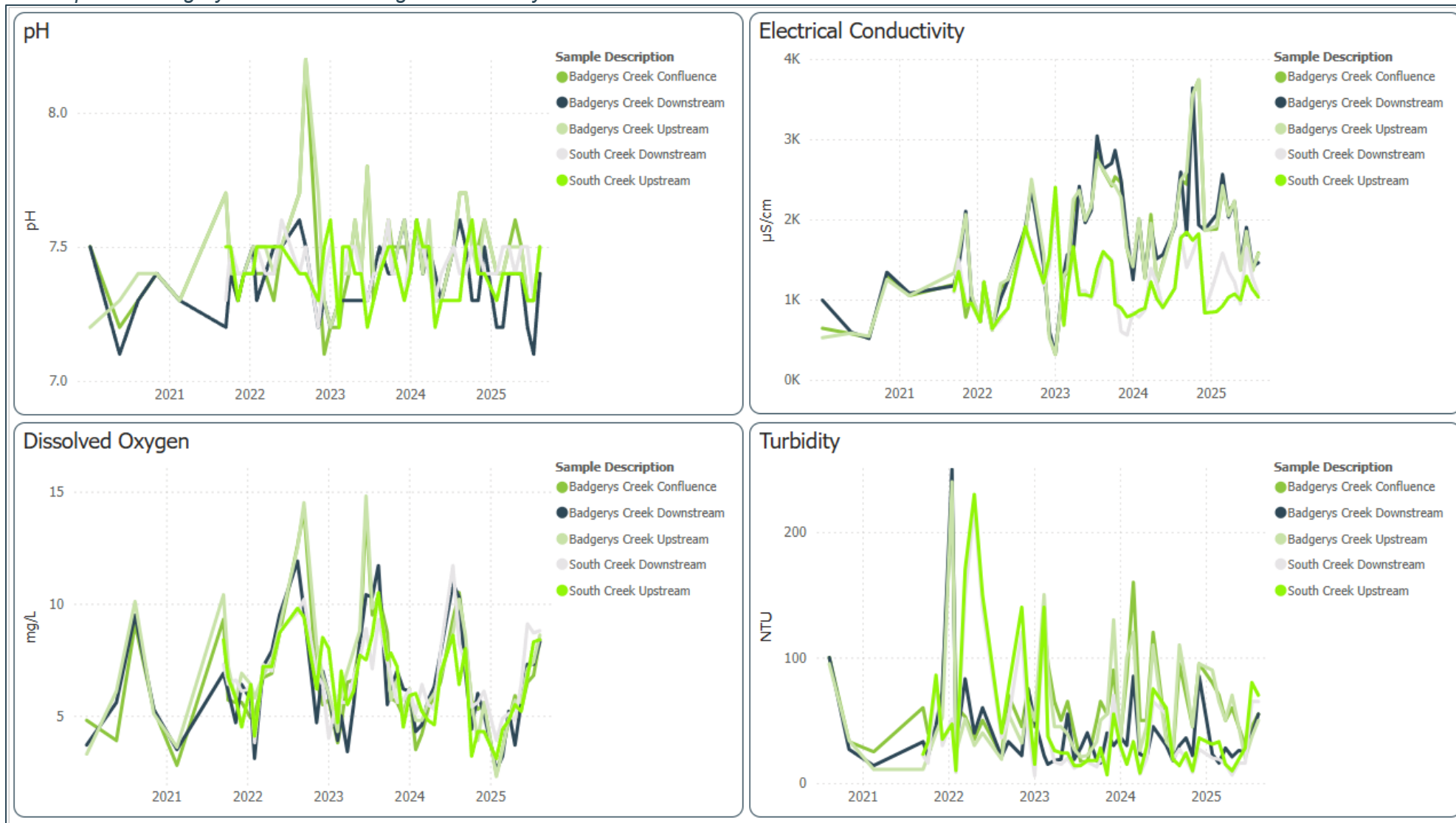
Date	Flowmeter Start	Flowmeter end of Day	Monthly Volume (KL)	Comments
1/12/2012	588,025	588,025	-	Q4: 1st December 2022 - 3rd March 2023
2/03/2023	588,025	593,378	5,353	Q4: 1st December 2022 - 3rd March 2023
30/06/2023	593,378	610,114	16,736	Q1: March 2023
25/07/2023	610,114	613,895	3,781	Q2: July 2023
24/01/2024	613,895	642,641	28,746	Q2: July 2024

No water has been extracted or taken under the water licence ([Appendix D](#)).

9.4.2.3 Creek Monitoring

Badgerys and South Creeks have been monitored to assist with baseline values. Results are given in the tables and graphs below.

Graph 11. Badgerys Creek Monitoring Trends – Physical Attributes



Graph 12. Badgerys Creek Monitoring Trends – Nutrients

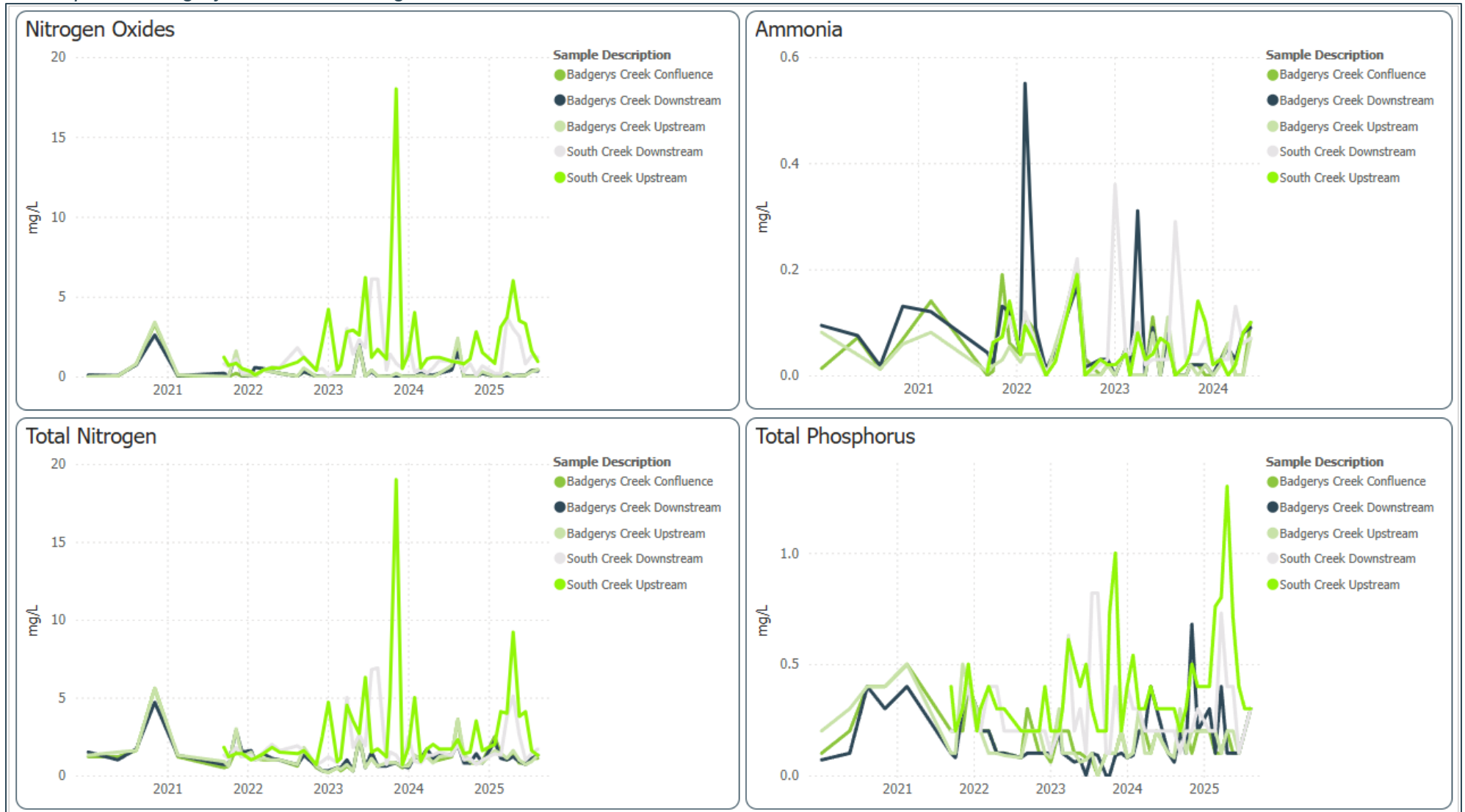


Table 18. Creek Water Results

Creek Water Summary for Report Period

5/5/2024

5/4/2025

Units are mg/L except where noted

Sample Description	No of Samples	Min of pH	Average of pH	Max of pH	Min of Electrical Conductivity uS/cm	Average of Electrical Conductivity uS/cm	Max of Electrical Conductivity uS/cm	Min of Dissolved Oxygen	Average of Dissolved Oxygen	Max of Dissolved Oxygen
▼										
South Creek Upstream	11	7.3	7.4	7.6	834	1,265	1,840	3.1	5.4	8.6
South Creek Downstream	11	7.4	7.4	7.5	854	1,359	1,800	3.9	6.5	11.7
Badgerys Creek Upstream	11	7.3	7.5	7.7	1,430	2,385	3,740	2.3	6.0	10.2
Badgerys Creek Downstream	11	7.2	7.4	7.6	1,560	2,198	3,640	2.6	6.0	10.9
Badgerys Creek Confluence	11	7.3	7.5	7.7	1,460	2,368	3,740	2.4	6.2	10.5

Sample Description	No of Samples	Min of NOx as N	Average of NOx as N	Max of NOx as N	Min of Ammonia as N	Average of Ammonia as N	Max of Ammonia as N	Min of Total Nitrogen	Average of Total Nitrogen	Max of Total Nitrogen
▼										
South Creek Upstream	11	0.790	2.078	6.000	0.10	0.10	0.10	1.4	3.0	9.2
South Creek Downstream	11	0.100	1.081	3.700	0.07	0.07	0.07	0.7	1.8	5.1
Badgerys Creek Upstream	11	0.000	0.345	2.400	0.07	0.07	0.07	0.8	1.4	3.6
Badgerys Creek Downstream	11	0.006	0.230	1.500	0.09	0.09	0.09	0.8	1.3	2.2
Badgerys Creek Confluence	11	0.000	0.313	2.200	0.10	0.10	0.10	0.8	1.4	3.6

Sample Description	No of Samples	Min of Total Phosphorus	Average of Total Phosphorus	Max of Total Phosphorus
▼				
South Creek Upstream	11	0.20	0.51	1.30
South Creek Downstream	11	0.10	0.27	0.73
Badgerys Creek Upstream	11	0.08	0.17	0.30
Badgerys Creek Downstream	11	0.06	0.23	0.68
Badgerys Creek Confluence	11	0.07	0.15	0.20

9.5 GROUNDWATER

9.5.1 Performance Criteria

9.5.1.1 Groundwater Levels

The proponent will not extract any extractive materials or carry out any work in the extraction area below 35 m below the pre-existing natural surface of the ground, other than construction of approved bores or in-pit sumps. The depth of extraction will be confirmed annually via survey.

A total of 12 standpipe piezometers are monitored to augment baseline data.

9.5.1.2 Groundwater Quality

Groundwater quality testing and criteria was informed by the Alluvial Aquifer Assessment and was approved as an Appendix in the SWMP. It includes testing of groundwater monitoring bores, in-pit collected waters, and surface creek waters so that collected sources can be estimated. Parameters currently being monitored to augment baseline data include:

- pH, EC and total dissolved solids (TDS);
- Major cations and anions; and
- Dissolved metals (Aluminium, Arsenic, Chromium, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Zinc, Boron, Iron).

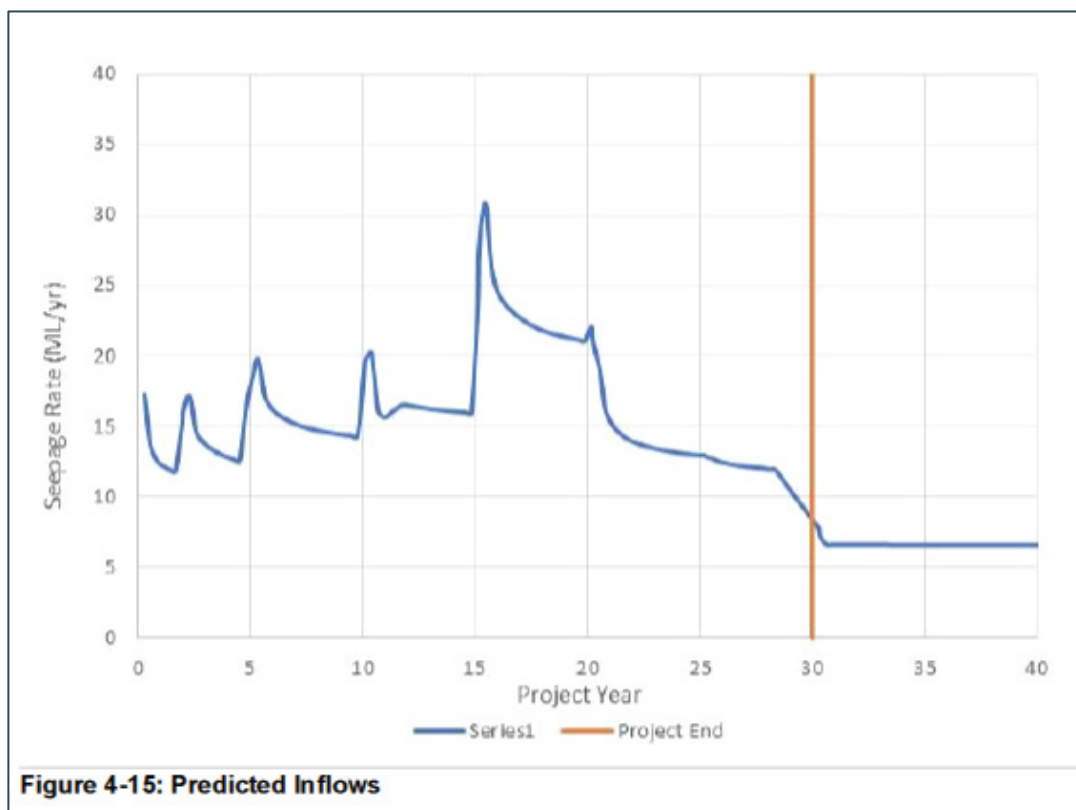
9.5.2 Predictions

9.5.2.1 Groundwater Inflow and Dewatering of Aquifers

The draft Alluvial Aquifer Assessment (Groundwater Exploration Services January 2019) predicted that;

‘Combined temporal seepage into the various separate pit excavations from the prediction model are shown in Figure 4-15. The punctuated nature of increases in seepage rates is partly a function of the drain implementation and the time stepping used within the model. However, it is anticipated that short term increases in seepage rates would occur as new excavation areas are opened. Predicted rates indicate the inflows increase slightly from current static inflow rates into Pit 1 and peaking at approximately 31 ML/yr in Year 16 as multiple excavations are open. A gradual decline following Year 16 to approximately 9 ML/year at the completion of mining activities on site. The decline reflects the progressive backfilling of completed pits and the associated recovery that occurs. Inflows continue to decline following project completion until static conditions prevail at approximately 7 ML/yr similar to the current modelled conditions associated with Pit 1.’

Graph 13. Predicted Groundwater Inflows
(Figure 4-15 of draft Alluvial Aquifer Assessment)



9.5.2.2 Groundwater Levels

There were no specific predictions regarding the groundwater levels in the EIS.

The draft Alluvial Aquifer Assessment predicts that the extent of impact on groundwater level will have a very small footprint surrounding the open excavations with a steep drawdown cone surrounding each one. This will insulate potential impacts on either Badgerys Creek or South Creek, or any alluvium associated with either of these creek systems.

9.5.2.3 Groundwater Quality

The EIS states there is the potential for spills and contamination by metals and hydrocarbons from the machinery, waste disposal, waste oil used in maintenance of equipment and fuel storage areas; however adequate prevention measures should prevent contamination of the groundwater system.

Groundwater Quality monitoring will continue to be undertaken and will be compared to performance criteria once established.

9.5.2.4 Impact of Groundwater Dependant Ecosystems

Dewatering of the alluvial sediments has the potential to result in impacts to base flows and groundwater dependant ecosystems (if present).

The draft Alluvial Aquifer Assessment predicts that overall, the proposal will have a very limited impact on baseflow to local creeks. This is primarily due to limited impact on surficial soils and the influence of low hydraulic conductivities on the groundwater system.

9.5.2.5 Existing Groundwater Users

The draft Alluvial Aquifer Assessment states the closest registered bore not associated with the Project Site is located more than 1km to the north. As impacts are predicted to largely be contained with the project boundaries, no impact to other users is anticipated.

9.5.3 Monitoring Results

CSR conducted quarterly groundwater monitoring in the reporting period, see [Appendix G](#) for results. .

In summary the monitoring results indicate that the results are consistent with the previous reporting period. Ground water levels reflect the topography of the site and show poor connectivity within the shale geological unit (Wianamatta Shale). Dewatering activities of Pit 3 do not appear to have an impact on the groundwater elevation.

Water quality data confirms that the groundwater is brackish to saline and generally consistent with the previous reporting year.

9.6 WASTE MANAGEMENT

Condition 39 of schedule 3 requires that waste management and minimisation is reported in the Annual Review. All site contractors remove any rubbish when they leave. There has been no waste received on the site for storage, treatment, processing, reprocessing or disposal.

10 Activities Proposed in the Next AR Period

10.1 OPERATIONAL ACTIVITIES

Activities proposed for the next reporting period will include:

- Stockpiles containing materials not suitable for brickmaking will be placed within existing Pit 2;
- Importation of fill material to continue;
- Dewater Pit 2 and 1, and continue filling of Pit 2; and
- Commencement of filling of Pit 1;

10.2 IMPROVEMENTS TO ENVIRONMENTAL PERFORMANCE

All management plans have been updated and submitted for DPE approval to encompass all proposed activities in the next reporting period. The operators are undertaking an audit of the site to outline any improvements required and will continue to monitor performance against the current approved management plans.

Appendix A

Consent Conditions

Project Approval

Section 75J of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning and Infrastructure, I approve the project application referred to in Schedule 1, subject to the conditions in Schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Richard Pearson
**Deputy Director-General, Development Assessment and
Systems Performance**

Sydney

2011

SCHEDULE 1

Application Number:

10_0014

Applicant:

CSR Building Products Limited

Approval Authority:

Minister for Planning and Infrastructure

Land:

See Appendix 1

Development:

Badgerys Creek Quarry and Brick Making Project

Navy text shows Modification 2 May 2018

Green Type shows Modification 3 and 4 August 2020

Red Type shows Modification 5 January 2022

Purple Type shows Modification December 2024

The Department has prepared a consolidated version of the consent which is intended to include all modifications to the original determination instrument.

The consolidated version of the consent has been prepared by the Department with all due care. This consolidated version is intended to aid the consent holder by combining all consents relating to the original determination instrument but it does not relieve a consent holder of its obligation to be aware of and fully comply with all consent obligations as they are set out in the legal instruments, including the original determination instrument and all subsequent modification instruments.

CONSOLIDATED CONSENT

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CONSOLIDATED CONSENT

DEFINITIONS

Aboriginal object or place	Have the same meaning as the definitions of the terms in section 5 of the NP&W Act
Annual Review	The review required by condition 12 of Schedule 5
Applicant	CSR Building Products Limited (or its successors) or any person carrying out any development to which this consent applies
BCA	Building Code of Australia
BCS	Biodiversity Conservation and Science Group of NSW Department of Climate Change, Energy, the Environment and Water
Brickmaking Activities	The manufacturing, storage and sale of brick products, and associated operation of the innovation centre and laboratory described in EA (Mod 3 and 4)
Calendar year	A period of 12 months from 1 January to 31 December
CCC	Community Consultative Committee
Conditions of this consent	Conditions contained in Schedules 2 to 5 (inclusive) of this document
Construction Activities	All physical works to enable mining operations to be carried out, including demolition and removal of buildings or works, and erection of buildings and other infrastructure permitted by this consent
Council	Liverpool City Council
Day	The period from 7 am to 6 pm on Monday to Saturday, and 8 am to 6 pm on Sundays and Public Holidays
Department	NSW Department of Planning, Housing and Infrastructure
Demolition	The deconstruction and removal of buildings, sheds and other structures on the site
Development	The development described in the documents listed in condition 3 of Schedule 2 and includes Quarrying Operations, Brickmaking Activities and rehabilitation activities
Development layout	The plans in Appendix 3 of this consent
Dewatering	Removal of accumulated water from Pits 2 and 3 into Pit 1, and removal of water accumulated in Pit 1
EA	Environmental Assessment titled <i>Boral Badgerys Creek Continued Operation of Quarry and Brick Making Facility</i> (Volumes 1 – 3), prepared by AECOM and dated November 2010, and associated Response to Submissions titled <i>Boral Badgerys Creek Continued Operation of Quarry and Brick Making Facility – Submissions Report</i> , prepared by AECOM and dated June 2011
EA (Mod 1)	Environmental Assessment titled <i>Boral Badgerys Creek Quarry and Brick Making Project, Application Number: 10_0014</i> , prepared by Boral Property Group and dated 5 November 2012
EA (Mod 2)	Environmental Assessment titled <i>Badgerys Creek Brick Making Facility Modification 2 Environmental Assessment</i> prepared by Element Environment and dated November 2017, the associated the Response to Submissions prepared by Element Environment and dated February 2018, and additional information provided by Element Environment dated 8 March 2018
EA (Mod 3 and 4)	Environmental Assessment titled <i>CSR Advanced manufacturing hub – Modification 3 Environmental Assessment</i> prepared by Element Environment and dated March 2019, Environmental Assessment titled <i>CSR Advanced manufacturing hub – Modification 4 Environmental Assessment</i> prepared by Element Environment and dated March 2019, the associated Response to Submissions Reports prepared by Element Environment and dated October 2019, and additional information provided by CSR Limited and dated 5 May 2020
Eastern Airport Ring Road	Transport corridor associated with development of the WSA and depicted in the <i>draft Western Sydney Aerotropolis Plan</i> (or later version)
ENM	Excavated Natural Material, as defined in the EPA's resource recovery orders (ENM Order) and exemptions (ENM Exemption) under clauses 91, 92, and 93 of the Waste Regulation
ENM Exemption	'The excavated natural material exemption 2014' under clauses 91 and 92 of Waste Regulation
ENM Order	'The excavated natural material order 2014' under clause 93 of the Waste Regulation
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence under the POEO Act
Evening	The period from 6 pm to 10 pm
Fill	Includes VENM, ENM and soils in the form of tunnel spoil that meet the requirements of a specific resource recovery order and resource recovery

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Finished Building Products	exemption granted by the NSW EPA and approved by the EPA to be applied to land within Lot 2 DP1278780 Building products prepared or manufactured on site and off site, as described in EA (Mod 3 and 4) and EA (Mod 2), respectively.
Heritage NSW Incident	Heritage NSW within the Department of Premier and Cabinet An occurrence or set of circumstances that: - causes or threatens to cause material harm to the environment; and/or - breaches or exceeds the limits or performance measures/criteria in this consent
Laden trucks	Trucks transporting bricks, quarry products or finished building products to or from the site
Land	Has the same meaning as the definition of the term in section 4 of the EP&A Act, except where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this consent, where it is defined as the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent
m	Metres
Martin Road – Elizabeth Road Intersection Upgrade	The upgrade of the Martin Road – Elizabeth Drive Intersection to a standard required by Condition 25A of Schedule 3
Material harm	Is unauthorised harm that: - involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or - results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)
MEG	Regional NSW – Mining, Exploration & Geoscience
Minimise	Implement all reasonable and feasible mitigation measures to reduce the impacts of the development
Minister	Minister for Planning, or delegate
Mitigation	Activities associated with reducing the impacts of the development prior to or during those impacts occurring
Modification 3 and 4	The modifications to the development, as described in EA (Mod 3 and 4)
Modification Report (Mod 5)	The Modification Report titled <i>Badgerys Creek Quarry and Brick Making Project Modification 5</i> prepared by Element Environment dated October 2021 and further response prepared by CSR Building Products Limited dated December 2021
Modification Report 6	Modification Report titled “Badgerys Creek Quarry and Brick Making Project Modification 6”, dated 3 September 2024. Prepared by Element Environment and letter dated 7 November 2024
Morning Shoulder Period	The period from 5 am to 7 am Monday to Saturday
Night	The period from 10 pm to 7 am on Monday to Saturday, and 10 pm to 8 am on Sundays and Public Holidays
NP&W Act	National Parks and Wildlife Act 1974
NRAR	NSW Natural Resources Access Regulator
NSW Water Group	NSW Department of Climate Change, Energy, the Environment and Water – Water Group
Phase 1	The initial phase of development associated with Modification 3 and 4, that comprises: - construction activities; - brickmaking activities; - dewatering of Pits 1, 2 and 3; - quarrying activities in Pit 3. - Fill import for quarry rehabilitation activities and preferential backfilling of Pits 1, 2 and 3.
Phase 2	The phase of the development associated with Modification 3 and 4 that commences from the date of completion of backfilling of Pits 1 and 2 and comprises: - construction activities; - brickmaking activities; - quarrying activities in Pit 3; - Fill import for quarry rehabilitation activities and progressive backfilling of Pit 3.
Phase 3	The phase of the development associated with Modification 3 and 4 that commences from the date of completion of extraction activities in Pit 3 and comprises: - brickmaking activities; - Fill import for quarry rehabilitation activities and backfilling of Pit 3.

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Phase 4	The phase of development associated with Modification 3 and 4 that commences from the date of completion Fill import to site and the backfilling of Pit 3, and comprises: - brickmaking activities; and - residual rehabilitation activities (excluding Fill import).
PMF	Probable Maximum Flood event
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
Privately-owned land	Land that is not owned by a public agency or a mining, petroleum or extractive industry company (or its subsidiary)
Public infrastructure	Linear and other infrastructure that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc.
Quarrying operations	The extraction, processing, stockpiling and transportation of extractive materials carried out on the site and the associated removal and/or emplacement of vegetation, topsoil and overburden
Quarry products	Includes all saleable quarry products, including raw materials, but excludes bricks, tailings, other wastes and rehabilitation material for use on the site
Quarry water	Water that accumulates within active quarrying areas, overburden emplacement areas and infrastructure areas, synonymous with dirty water
Raw materials	Extractive materials used in making brick, tiles, clay pipes or similar
Registered Aboriginal Parties	As described in the <i>National Parks and Wildlife Regulation 2009</i>
Rehabilitation	The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting
Reasonable	Means applying judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements
Resources Regulator	NSW Resources Regulator within the Department of Regional NSW
Secretary	Planning Secretary under the EP&A Act, or nominee
Site	The land defined in Appendix 1
Statement of Commitments	The Applicant's commitments in Appendix 6
TfNSW	Transport for New South Wales
VENM	Virgin Excavated Natural Material, as defined in clause 50 of Schedule 1 of the POEO Act
Waste	Has the same meaning as defined in the Dictionary to the POEO Act
Waste Regulation	<i>Protection of the Environment (Waste) Regulation 2014</i>
WSA	Western Sydney Airport

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SCHEDULE 2 ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance measures and criteria established under this **consent**, the **Applicant** must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the **development**, and any rehabilitation required under this **consent**.

TERMS OF CONSENT

2. The **Applicant**, in acting on this **consent**, must carry out the **development**:
 - (a) in compliance with the conditions of this **consent**;
 - (b) in accordance with all written directions of the Secretary; and
 - (c) in accordance with the **development** layout.
3. The **Applicant**, in acting on this **consent**, must carry out the **development** in general accordance with the:
 - (a) EA and Statement of Commitments;
 - (b) EA (Mod 1);
 - (c) EA (Mod 2);
 - (d) EA (Mod 3 and 4);
 - (e) Modification Report (Mod 5); and
 - (f) Modification Report 6.
4. The conditions of this **consent** and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document referenced in condition 3 of this Schedule. In the event of an inconsistency, ambiguity or conflict between any of the documents referenced in condition 3 of this Schedule, the most recent document prevails.

*Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of **consent** or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.*
5. Consistent with the requirements of this **consent**, the Secretary may make written directions to the **Applicant** in relation to:
 - (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this **consent**, including those that are required to be, and have been, approved by the Secretary; and
 - (b) the implementation of any actions or measures contained in any such document referred to in (a) above.

Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of consent or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.

STAGED DEVELOPMENT

- 5A. The **development** as modified by EA Mod 3 and 4, must be undertaken sequentially in the following stages:
 - (a) Phase 1;
 - (b) Phase 2;
 - (c) Phase 3; and
 - (d) Phase 4.

Note: Each of these phases is listed in the definitions and shown in Appendix 3.
- 5B. The **Applicant** must notify the Department in writing, at least two weeks before the date of:
 - (a) the commencement of each Phase of the **development**;
 - (b) the completion of extraction in Pit 3;
 - (c) cessation of Brickmaking Activities; and
 - (d) decommissioning.

COMPLIANCE

6. The **Applicant** must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this **consent** relevant to activities they carry out in respect of the **development**.

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APPLICABILITY OF GUIDELINES

7. References in the conditions of this **consent** to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, standards or policies in the form they are in as at the date of this **consent**.

However, consistent with the conditions of this **consent** and without altering any limits or criteria in this **consent**, the Secretary may, when issuing directions under this **consent** in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, standard or policy, or a replacement of them.

LIMITS OF CONSENT

8. The **Applicant** may carry out quarrying operations on the site until 27 September 2031.

*Note: Under this **consent**, the **Applicant** is required to decommission and rehabilitate the site and carry out additional requirements. Consequently, this **consent** will continue to apply in all respects other than to permit the carrying out the **development**, until the rehabilitation of the site and those requirements and undertakings have been carried out to the required standard.*

9. *(Deleted).*

- 9A. The **Applicant** may receive, store, and dispatch finished building products at the site until brick making at the site commences.

10. The **Applicant** must not exceed the limits in Table 1 during any calendar year.

Table 1: Limits on extraction, production, receipt and dispatch volumes per calendar year

Activity	Development Phase	Total Volume (tonnes per calendar year)
Extraction from Pit 3	Phase 1 and 2	420,000
Receive raw materials for brickmaking	Phase 1 and 2	215,000
	Phase 3 onwards	360,000
Dispatch raw materials	Phase 1,2 and 3	275,000
Brick production	All Phases	300,000
Dispatch finished building products	All Phases	330,000

*Note: The Total Volume limits in Table 1 do not apply to the import of **Fill** for the purpose of backfilling voids. The import of **Fill** is separately managed under the restrictions on truck movements contained in Conditions 12, of this Schedule.*

11. The **Applicant** must not transport bricks or quarry products to or from the site, other than by road.
12. The **Applicant** must not exceed the total truck movements detailed in Table 2.

Table 2: Total Truck Movements

Transport Route Stage	Development Phases	Day	Total truck movements ^a
Prior to the upgrade of the Martin Road-Elizabeth Drive Intersection	1,2 and 3	Monday to Friday	120
		Saturday	40
		Sundays	40
Following completion of the Martin Road-Elizabeth Drive Intersection upgrade	1,2 and 3	Monday to Friday	800
		Saturday	358
		Sundays	200
	4	Monday to Friday	366
		Saturday	98
		Sunday	0

^a *Note: each truck entering or exiting the site is counted as a separate movement.*

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- 12A. Truck movements entering or exiting the site on Sundays are restricted to the importation of Fill for the purpose of backfilling quarry pits and rehabilitation activities.

Note: Truck movements are also controlled, further restricted by the limits in condition 10 of this Schedule and operating hours in condition 1 of Schedule 3.

STRUCTURAL ADEQUACY

13. All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the BCA.

Notes:

- Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for any proposed building works;
- Part 8 of the EP&A Regulation sets out the requirements for the certification of the development
- A detailed stormwater drainage design, prepared by a qualified practicing civil engineer, is to be submitted to Council prior to the issue of a construction certificate.

BRICK KILN STACKS

- 13A. The brick kiln stacks must not exceed 41 m above natural ground level.

DEMOLITION

14. All demolition work must be carried out in accordance with the Australian Standard AS 2601-2001: The Demolition of Structures (Standards Australia, 2001).

PROTECTION OF PUBLIC INFRASTRUCTURE

15. Unless the Applicant and the applicable authority agree otherwise the Applicant must:
- (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
 - (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to damage to roads caused as a result of general road usage or otherwise addressed by contributions required by condition 25 of Schedule 3.

OPERATION OF PLANT AND EQUIPMENT

16. All plant and equipment used on the site, or to monitor the performance of the development, must be:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.
- 16A. The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA. Before the issue of a Construction Certificate and an Occupation Certificate, the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Secretary within seven days after the Certifying Authority accepts it.

PRODUCTION DATA

17. The Applicant must:
- (a) provide calendar year annual quarry production data to MEG using the standard form for that purpose; and
 - (b) include a copy of this data in the Annual Review.

LIMITS OF EXTRACTION

Identification of Approved Extraction Limits

18. Within 3 months of the determination of Modification 3 and 4, the Applicant must:
- (a) engage a registered surveyor to mark out the boundary of the approved area of extraction within Pit 3; and
 - (b) provide the Secretary with a survey plan of the boundary.

The boundary of the approved area of extraction within Pit 3 must be clearly marked in a manner that allows them to be easily identified at all times during the carrying out of quarrying operations.

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Maximum Extraction Depth

19. The **Applicant** must not extract any extractive materials or carry out any work in the extraction area below 35 m below the pre-existing natural surface of the ground, other than construction of bores approved by **NSW Water Group** or in-pit sumps approved by the Secretary.
-

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SCHEDULE 3 ENVIRONMENTAL PERFORMANCE CONDITIONS

NOISE

Hours of Operation

- The **Applicant** must comply with the operating hours set out in Table 1.

Table 1: Operating hours

Activity	Permissible Hours
Quarrying operations (excluding truck arrival, loading and dispatch)	7.00 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Brickmaking Activities	24 hours per day, 7 days per week
Truck arrival and dispatch (raw materials only)	6.00 am to 10.00 pm Monday to Friday
	6.00 am to 6.00 pm Saturday
	At no time on Sundays or public holidays
Truck arrival and dispatch (finished building products only)	5.00 am to 10.00 pm Monday to Friday
	6.00 am to 6.00 pm Saturday
	At no time on Sundays or public holidays
Truck arrival and dispatch (Fill import only)	7.00 am to 6.00 pm Monday to Saturday
	9.00 am to 6.00 pm Sunday
	At no time on public holidays
Cash sales	6.00 am to 6.00 pm Monday to Saturday
	At no time on Sundays or public holidays
Sales selection/Customer Display Centre	8.00 am to 5.00 pm Monday to Sunday
Maintenance	At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations

- With the written agreement of the Secretary, the **Applicant** may undertake limited campaign trucking (within the limits imposed under conditions 10 and 12 of Schedule 2) for the import of **Fill** outside of the operating hours prescribed in condition 1 of this Schedule.
- The following activities may be carried out outside the hours specified in condition 1 of this Schedule:
 - activities that are inaudible at residences on privately-owned land;
 - the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or
 - emergency work to avoid the loss of life, property or to prevent material harm to the environment.

In such circumstances, the **Applicant** must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.

Construction Noise

- Approved construction works must only be undertaken during standard construction hours (7 am to 6 pm, Monday to Friday and 8 am to 1 pm on Saturdays), unless the Secretary agrees otherwise.
- (Deleted).

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Operational Noise Criteria

5. The **Applicant** must ensure that operational noise generated by the **development** (including construction activities) does not exceed the criteria in Table 2 at any residence on privately-owned land.

Table 2: Operational noise criteria dB(A)

Receiver ID	Morning Shoulder	Day	Evening	Night	
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{AFmax}
R9, R25, R35	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46	42	42	41	38	52
R11, R12, R13, R14, R15	43	43	43	38	52
All other residences	-	40	35	35	52

Noise generated by the **development** must be monitored and measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry (NSW EPA 2017)*.

However, the noise criteria in Table 2 do not apply if the **Applicant** has an agreement with the relevant landowner to exceed the noise criteria, and the **Applicant** has advised the Department in writing of the terms of this agreement.

Note: Should an agreement with a landowner be terminated for any reason, the **Applicant** must comply with the noise criteria in Table 2.

Road Traffic Noise Criteria

6. The **Applicant** must ensure that the **road** traffic noise generated by the **development** does not exceed the criteria in Table 3 at any privately-owned residence.

Table 3: Road traffic noise criteria dB(A)

Road Noise Receiver ID	Day / Evening L _{Aeq} (1 hour)	Night L _{Aeq} (1 hour)
Prior to Martin Road – Elizabeth Road Intersection Upgrade		
Residents on Martin Road	60	55
Following Martin Road – Elizabeth Road Intersection Upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residences on Martin Road	60	55

Traffic noise generated by the **development** is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW).

However, the noise criteria in Table 3 do not apply if the **Applicant** has an agreement with the relevant landowner to exceed the noise criteria, and the **Applicant** has advised the Department in writing of the terms of this agreement.

- 6A. Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the **Applicant** must implement noise mitigation treatment packages as described in the EA (Mod 3 and 4) and as set out in the *RMS Draft At-Receiver Treatment Packages*.

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If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Noise Operating Conditions

7. The Applicant must:
- take all reasonable steps to minimise the construction, operational, low frequency and road transportation noise of the development;
 - take all reasonable steps to minimise the noise impacts of the development during noise enhancing meteorological conditions;
 - operate a noise management system to guide the day to day planning of quarrying operations and the implementation of noise mitigation measures to ensure compliance with the relevant conditions of this consent;
 - carry out regular noise monitoring to determine whether the development is complying with the relevant conditions of this consent; and
 - modify or stop operations on the site to comply with the relevant conditions of this consent.

Note: Monitoring under this consent is not required at all residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria, if agreed to by the Secretary.

Noise Management Plan

8. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
- be submitted to the Secretary for approval prior to commencing Modification 3 and 4, unless otherwise agreed by the Secretary;
 - describe the measures to be implemented to ensure:
 - compliance with the noise criteria and operating conditions of this consent;
 - best practice management is being employed;
 - residences listed in condition 6A of this Schedule are notified of their rights to request road noise mitigation measures;
 - vibration impacts are minimised; and
 - the construction and operational noise impacts of the development are minimised during noise enhancing meteorological conditions;
 - describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to noise are implemented;
 - include a consultation plan detailing:
 - procedures for notifying and consulting nearby residents prior to the recommencement of quarrying and brick making activities;
 - procedures for notifying and consulting nearby residents prior to the commencement of construction activities;
 - details of a telephone complaints line (operated at all hours) and relevant site persons responsible for following up complaints;
 - procedures for handling and monitoring all complaints received; and
 - contingency measures that would be implemented where complaints are received;
 - describe the proposed noise management system; and
 - include a noise monitoring program that:
 - is capable of evaluating the performance of the development;
 - includes a protocol for determining any exceedances of the relevant conditions of this consent; and
 - effectively supports the noise management system.

The Applicant must implement the Noise Management Plan as approved by the Secretary.

AIR QUALITY

Air Quality Impact Assessment Criteria

9. The Applicant must ensure that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land.

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Table 4: Air quality criteria

Pollutant	Averaging Period	Criterion	
Particulate matter < 2.5 µm (PM ₁₀)	Annual	a,d 8 µg/m ³	
Particulate matter < 2.5 µm (PM ₁₀)	24 hour	b 25 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	Annual	a,d 25 µg/m ³	
Particulate matter < 10 µm (PM ₁₀)	24 hour	b 50 µg/m ³	
Total suspended particulates (TSP)	Annual	a,d 90 µg/m ³	
^c Deposited dust	Annual	b 2 g/m ² /month	a,d 4 g/m ² /month

Notes to Table 4:

a Total impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).

b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development).

c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

Operating Conditions

10. The Applicant must:
 - (a) implement best practice management to minimise the dust emissions of the development;
 - (b) implement all air quality management and mitigation measures that were committed to in the EA (Mod 3 and 4);
 - (c) implement real-time monitoring of 24-hour average PM₁₀ and meteorological conditions;
 - (d) regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this consent;
 - (e) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d under Table 4);
 - (f) monitor and report on compliance with the relevant air quality conditions in this consent; and
 - (g) minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary.
- 10A. During Phase 4, the Applicant may request the Secretary's agreement to reduce or waive certain air quality monitoring requirements if the Applicant can demonstrate that they are no longer necessary.
11. The Applicant must ensure compliance with stack emission limits and gaseous pollutant load limits included in any EPL applicable to the site.
12. Within 14 months of commencement of increased production of bricks to 300,000 tonnes per year, or as otherwise required by the EPA, the Applicant must submit an Air Quality Verification Assessment to the EPA, and must provide a copy of this assessment to the Secretary. The Air Quality Verification Assessment must be completed in accordance with the requirements of the EPL for the premises.

Air Quality Management Plan

13. The Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
 - (a) be prepared in consultation with relevant WSA authorities;
 - (b) be submitted to the Secretary for approval prior to commencing Phase 1, unless otherwise agreed by the Secretary;
 - (c) describe the proposed air quality management system;
 - (d) describe the measures to be implemented to ensure:
 - compliance with the air quality criteria and operating conditions of this consent;
 - best practice management is being employed; and
 - the air quality impacts of the development are minimised during adverse meteorological conditions and extraordinary events;
 - (e) describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to air quality are implemented;
 - (f) include a program to ensure surface disturbance associated with quarrying operations is minimised;

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- (g) include an air quality monitoring program that:
 - is capable of evaluating the performance of the **development** and informing day to day operational decisions;
 - includes a protocol for determining any exceedances of the relevant conditions of this **consent**; and
 - effectively supports the air quality management system; and
- (h) include a program to:
 - notify affected landowners of the potential health-related impacts associated with dust;
 - respond effectively to enquiries or complaints.

The **Applicant** must implement the Air Quality Management Plan as approved by the Secretary.

Meteorological Monitoring

14. For the life of the **development**, the **Applicant** must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the *Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales* guideline and is capable of measuring meteorological conditions in accordance with the *NSW Noise Policy for Industry* (EPA, 2017).

Odour

15. The **Applicant** must ensure that no offensive odours, as defined by the POEO Act, are emitted from the site.

Greenhouse Gas Emissions

16. The **Applicant** must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.

SOIL AND WATER

*Note: Under the Water Act 1912 and/or the Water Management Act 2000, the **Applicant** is required to obtain all necessary approvals and/or water licences for the **development**.*

Water Supply

17. The **Applicant** must ensure that it has sufficient water for all stages of the **development**, and if necessary, adjust the scale of operations under the **consent** to match its available water supply, to the satisfaction of the Secretary.
- 17A. The **Applicant** must report on water extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.

Water Discharges

18. The **Applicant** must ensure that all quarry water from the site is contained wholly within the site **except where discharges are otherwise authorised by condition 19 and 19A of this Schedule**.
19. The **Applicant** must ensure that all surface water discharges from the site comply with the limits (both volume and quality) set in any EPL applicable to the site.

Dewatering of Pits 1, 2 and 3

- 19A. All water that is dewatered from Pit 1 (including any water transferred into Pit 1 from Pit 2 and Pit 3) must be transferred from the site in accordance with the Dewatering Management Plan required under Condition 23A of this Schedule.
- 19B. All dewatering activities from Pit 1 must be completed within Phase 1 unless otherwise agreed by the Secretary.

Riparian Buffer Distance

20. The **Applicant** must maintain a minimum setback width of 60 metres (measured from the top of bank) between extraction areas and both Badgerys Creek and Badgerys Creek tributary.

*Note: This condition does not prohibit overburden emplacement or rehabilitation works in accordance with the **Development** Layout Plan.*

Alluvial Aquifers

21. The **Applicant** must ensure that the **development** has no impact on alluvial aquifers associated with South Creek, Badgerys Creek or their tributaries.
22. *(Deleted)*

Soil and Water Management Plan

23. The **Applicant** must prepare a Soil and Water Management Plan for the **development** to the satisfaction of the Secretary. This plan must:
- (a) be prepared by a suitably qualified and experienced person/s approved by the Secretary;
 - (b) be prepared in consultation with **Council** and **NSW Water Group**;
 - (c) be submitted to the Secretary for approval prior to commencing **Phase 1**, unless otherwise agreed by the Secretary; and
 - (d) include a:
 - (i) Site Water Balance that includes:
 - details of:
 - sources and security of water supply;
 - water use and management on site;
 - adequacy of water storage facilities to contain all surface water runoff;
 - all existing Water Access Licences and potential Water Access Licences, including information on the relevant Water Sharing Plan and Water Sources;
 - any off-site water transfers, including those described in condition 23A of this Schedule; and
 - reporting procedures; and
 - measures to be implemented to minimise clean water use on site;
 - (ii) Surface Water Management Plan, that includes:
 - a program for obtaining detailed baseline data on surface water flows and quality in water bodies that could potentially be affected by the **development**;
 - a detailed description of the surface water management system on site including the:
 - clean water diversion system;
 - erosion and sediment controls;
 - dirty water management system; and
 - water storages, including the area, depth and capacity of any in-pit sumps;
 - detailed plans, including design objectives and performance criteria, for:
 - reinstatement of drainage lines on the rehabilitated areas of the site; and
 - control of any potential water pollution from rehabilitated areas of the site;
 - performance criteria for the following, including trigger levels for investigating any potentially adverse impacts on:
 - the water management system;
 - surface water quality in creeks and other water bodies that could potentially be affected by the **development** (including Badgerys Creek and Badgerys Creek tributary); and
 - the stream health, vegetation health and channel stability of water bodies that could potentially be affected by the **development**;
 - a program to monitor and report on:
 - any surface water discharges;
 - the effectiveness of the water management system;
 - the quality of water discharged from the site to the environment;
 - surface water flows and quality in local watercourses; and
 - the stream health, riparian vegetation health and channel stability of creeks and other water bodies that could potentially be affected by the **development**; and
 - a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the **development**; and
 - (iii) Groundwater Management Plan that includes:
 - measures to ensure that the maximum extraction depth is not exceeded (see condition 19 of Schedule 2);
 - a protocol to obtain appropriate water licence(s) to cover the volume of any unforeseen groundwater inflows into the quarry from the quarry face or floor;
 - groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts; and

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- a monitoring program to manage potential impacts, if any, on any alluvium and associated surface water source near the proposed extraction area that includes:
 - monitoring of boreholes within the alluvial sediments adjacent to Badgerys and South Creeks and their tributaries, and in the Bringelly Shale bedrock aquifer;
 - monitoring of groundwater inflows into the quarry from the quarry face or floor, or into any in-pit sumps;
 - monitoring the impacts of the development on baseflows to Badgerys and South Creeks and their tributaries;
 - identification of a methodology for determining exceedances of the assessment criteria;
 - a plan to respond to any exceedances of the performance criteria; and
 - a program to regularly report on monitoring.

The Applicant must implement the Soil and Water Management Plan as approved by the Secretary.

Dewatering Infrastructure Plan

- 23A. Prior to carrying out any construction activities associated with the dewatering activities on the site, the Applicant must prepare a Dewatering Infrastructure Plan for the development to the satisfaction of the Secretary. This plan must include:
- (a) detailed designs for:
 - any pipeline infrastructure used for dewatering activities; and
 - the method to be used to cross Badgerys Creek;
 - (b) a flooding assessment which:
 - considers the impacts of any structures (including overland pipelines) to flood flow within the floodplain up to the PMF; and
 - describes the measures that will be implemented to minimise those impacts; and
 - (c) a description of the measures to be implemented for:
 - managing construction and operation of minor surface infrastructure;
 - avoiding significant impacts and minimisation of impacts generally;
 - controlling any potential water pollution from construction;
 - minimising and managing erosion and sedimentation;
 - decommissioning of pipeline infrastructure; and
 - rehabilitating disturbed areas.

The Applicant must implement the Dewatering Management Plan as approved by the Secretary.

Dewatering Management Plan

- 23B. The Applicant must prepare a Dewatering Management Plan for the development to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with NSW Water Group and NRAR;
 - (b) be submitted to the Secretary for approval prior to dewatering activities from Pit 1, unless otherwise agreed by the Secretary; and
 - (c) include:
 - details of:
 - off-site water transfer or discharge arrangements; and
 - procedures for monitoring on volumes transferred off-site and reporting on this as part of Annual Review;
 - a Fauna Relocation Plan regarding the transfer of aquatic fauna from Pits 1, 2 and 3 prepared by a suitably qualified ecologist which includes details on:
 - native fauna species known to inhabit and/or use the pits which require transfer from the pits;
 - methodology proposed to transfer the fauna;
 - location and suitability of the proposed relocation sites;
 - any potential impacts of relocating the fauna to the relocation sites and proposed mitigation measures; and
 - details of ecologists to monitor dewatering activities;
 - a Geotechnical Monitoring Program, prepared by a suitably qualified and experienced geotechnical engineer, to examine and monitor the faces and high walls of the quarry pits to determine potential geotechnical hazards areas and evaluate risks of potential failures;
 - a program to monitor and report on dewatering that involves any discharge from the site, including:
 - the quality of any water discharged from the site;

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- surface water flows and quality in local watercourses; and
- the stream health, riparian vegetation health and channel stability of creeks and other water bodies that could potentially be affected by the discharges; and
- a plan to respond to any exceedances of the performance criteria and mitigate and/or offset any adverse surface water impacts of the discharges.

The **Applicant** must implement the Dewatering Management Plan as approved by the Secretary.

Flooding

- 23C. The **Applicant** must prepare and implement an Evacuation Plan for the site. This Evacuation Plan must be prepared in consultation with the State Emergency Services and include details of the site evacuation and sheltering procedures during flood events.

TRANSPORT

Road Haulage

24. Prior to commencing **Phase 1**, the **Applicant** must:
- (a) erect signage on Elizabeth Drive advising of “trucks turning”;
 - (b) install a wheel wash on the quarry access road and **Fill haul road** to prevent material being deposited on **Martin Road**; and
 - (c) ensure the access driveway from Martin Road is capable of catering for all heavy vehicles associated with the **development** in accordance with AS2890.2, to the satisfaction of Council.

Road Upgrade and Maintenance Contribution

25. Prior to the recommencement of quarrying operations, the **Applicant** must enter into a formal agreement with Council for:
- (a) the repair of historical impacts of trucking from the **development** on Martin Road; and
 - (b) annual road maintenance contributions to be paid to Council, based on the weight of all laden truck movements to and from the site, for the duration that Martin Road is vested in the Council as the roads authority.

The **Applicant** must provide evidence to the Secretary that the agreement has been executed and implemented to the satisfaction of Council.

If there is any dispute between the **Applicant** and Council, then either of the parties may refer the matter to the Secretary for resolution.

- 25A. Prior to increasing truck movement limits as specified in condition 12 of Schedule 2, the **Applicant** must complete an interim upgrade of the Martin Road and Elizabeth Drive Intersection. The final design of intersection must be to the satisfaction of the relevant roads authority/s and must:
- (a) be designed and constructed in accordance with Austroads Guidelines, Australian Standards and any requirements of the relevant road authority/s;
 - (b) include, at a minimum, a three phase signal operation including a right turn green light and pedestrian crossings on one Martin Road and one Elizabeth Drive approach;
 - (c) be subject to a Works Authorisation Deed (WAD) with TfNSW; and
 - (d) be funded by the **Applicant**, unless otherwise agreed with TfNSW.
- 25B. With the written agreement of the Secretary, the requirements of condition 25A of this Schedule may be waived if the **Applicant** can demonstrate that the Martin Road-Elizabeth Drive Intersection has been upgraded to achieve service, capacity and safety standards equivalent to or greater than those required under condition 25A of this Schedule.
- 25C. The **Applicant** must provide an area for a potential transport corridor associated with an extension of Martin Road through the site (as conceptually shown in Appendix 3). The final design and location of the transport corridor and any associated commercial arrangements must be determined in consultation with TfNSW.

The **Applicant** must advise the Secretary in writing of the final design and location of the transport corridor as agreed with TfNSW, and update relevant management plans, strategies or programs for the **development** to reflect the transport corridor.

Monitoring of Product Transport

26. The **Applicant** must keep accurate records of:
- (a) all truck movements to and from the site (including time of arrival and dispatch and nature of material transported);
 - (b) the weight of all bricks, **Fill** and quarry products transported to and from the site; and
 - (c) publish a summary of these records on its website every 6 months.

Operating Conditions

27. The **Applicant** must:
- (a) ensure that all laden trucks carrying quarry products, raw materials or **Fill** have their loads covered when arriving at or leaving the site;
 - (b) ensure that all trucks are cleaned of material that may fall from vehicles, before leaving the site;
 - (c) use its best endeavours to ensure that appropriate signage is displayed on trucks used to transport finished building materials, quarry products or raw materials to or from the **development** so they can be easily identified by road users; and
 - (d) continue to engage with TfNSW regarding the detailed planning and design for the Eastern Airport Ring Road.

Traffic Management Plan

28. The **Applicant** must prepare a Traffic Management Plan for the **development** to the satisfaction of the Secretary. This plan must:
- (a) be prepared in consultation with TfNSW, WSA and Council;
 - (b) be submitted to the Secretary for approval prior to commencing **Phase 1** operations, unless otherwise agreed by the Secretary;
 - (c) describe the processes in place to control the arrival and dispatch of trucks;
 - (d) include a Drivers' Code of Conduct that details the safe and quiet driving practices that must be used by drivers travelling to and from the site;
 - (e) describe the measures to be put in place to ensure compliance with the Drivers' Code of Conduct; and
 - (f) propose measures to minimise the transmission of dust and tracking of material onto the surface of the public road from vehicles leaving the quarry; and
 - (g) describe the measures to manage construction and cumulative traffic impacts on the surrounding road network;
 - (h) be updated as necessary to reflect the operational phases and truck movement limits specified in condition 12 of Schedule 2 and prior to the commencement of any construction works for the upgrade of the Martin Road – Elizabeth Drive Intersection or the Eastern Airport Ring Road.

The **Applicant** must implement the Traffic Management Plan as approved by the Secretary.

ABORIGINAL HERITAGE

29. The **Applicant** must ensure that:
- (a) archaeological salvage of site BC-01-09 is undertaken in accordance with Recommendation 1, Section 6.0 of the *Aboriginal Heritage Assessment – Addendum* in the EA; and
 - (b) regeneration works, dewatering activities and water discharges in the area of the archaeological deposit identified adjacent to Badgerys Creek (see Appendix 5) are either avoided, or else undertaken in a manner that will minimise harm to Aboriginal objects, to the satisfaction of the Secretary; and
 - (c) measures are implemented prior to the commencement of **Phase 1**, to conserve and protect the hearth feature within site BCBW18 AS 02 02 (AHIMS ID 45-5-5164).
30. The **Applicant** must prepare an Aboriginal Heritage Management Plan for the **development** to the satisfaction of the Secretary. The plan must:
- (a) be prepared by suitably qualified and experienced persons;
 - (b) be prepared in consultation with Registered Aboriginal Parties and Heritage NSW;
 - (c) be submitted to the Secretary for approval within 6 months of the determination of **Modification 3 and 4**, unless otherwise agreed by the Secretary;
 - (d) include a description of the measures that would be implemented to:
 - (i) protect, monitor and manage identified Aboriginal objects and Aboriginal places on the site (including any proposed archaeological investigations and salvage measures), including specific measures to ensure that the archaeological deposit adjacent to Badgerys Creek (see Appendix 5) is not impacted during regeneration operations;

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- (ii) conserve the entire extent of the hearth feature within site BCBW18 AS 02 (AHIMS ID 45-5-5164);
- (iii) manage the discovery of previously unidentified Aboriginal objects or Aboriginal places on the site; and
- (iv) facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site; and
- (e) include a protocol to be implemented in the event that skeletal remains are discovered during the development.

The Applicant must implement the Aboriginal Heritage Management Plan as approved by the Secretary.

31. If human remains are discovered on the site, then all work in the area surrounding the discovery must cease, and the area must be secured. The Applicant must immediately notify NSW Police Force and Heritage NSW, and work must not recommence in the area until authorised by NSW Police Force and Heritage NSW.
32. If any potential Aboriginal object or Aboriginal place is identified on the site, or suspected to be on the site:
 - (a) all work in the immediate vicinity of the object or place must cease immediately;
 - (b) a 10 m buffer area around the object or place must be cordoned off; and
 - (c) Heritage NSW must be contacted immediately.
33. Work in the immediate vicinity of a site identified in condition 32 of this Schedule may only recommence if:
 - (a) the object or place is confirmed by Heritage NSW upon consultation with the Registered Aboriginal Parties not to be an Aboriginal object or Aboriginal Place;
 - (b) the Aboriginal Cultural Heritage Management Plan is revised to include the object or place and appropriate measures in respect of it; or
 - (c) the Secretary is satisfied with the measures to be implemented in respect of the object or place and makes a written direction in that regard.

REHABILITATION

Rehabilitation Objectives

34. The Applicant must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (Mod 3 and 4) and shown in Appendix 4, and must comply with the objectives in Table 5.

Table 5: Rehabilitation Objectives

Feature	Objective
All areas of the site affected by the development	• Safe • Hydraulically and geotechnically stable • Non-polluting • Fit for the intended final land use(s) • Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimising visual impacts when viewed from surrounding land
Surface infrastructure	• Decommissioned and removed, unless otherwise agreed by the Secretary
Landscaping bunds	• Hydraulically and geotechnically stable • Vegetated
Pits 1, 2 and 3	• Backfilled to a landform that is consistent with natural ground level and is geotechnically stable • Free draining

Progressive Rehabilitation

35. The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation.

Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to future re-disturbance.

- 35A. The Applicant must complete the backfilling of Pits 1 and 2 within 6 years of commencement of Phase 1, or as otherwise agreed by the Secretary.

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- 35B. The **Applicant** must complete the backfilling of Pit 3 within 2 years of the date of completion of extraction activities in Pit 3, or as otherwise agreed by the Secretary.

Rehabilitation Management Plan

36. The **Applicant** must prepare a Rehabilitation Management Plan for the **development**, in accordance with the conditions imposed on the mining lease(s) associated with the **development** under the *Mining Act 1992*. This plan must:
- (a) be prepared in consultation with the Department, **NSW Water Group**, **BCS**, **TfNSW** and relevant **WSA** authorities and Council;
 - (b) build upon the Rehabilitation Objectives in Table 5 and the proposed rehabilitation strategy described in the EA (Mod 3 and 4) and shown in Appendix 4;
 - (c) investigate options for the future use of disturbed areas following the completion of backfilling operations, having regards to the strategic planning associated with the draft Western Sydney Aerotropolis Plan (or subsequently adopted NSW Government strategic plans);
 - (d) describe and justify the proposed rehabilitation strategy for the site, including the landform and use of the site following the completion of quarry operations;
 - (e) include details of the planting of replacement trees in riparian areas consistent with the Statement of Commitments and with vegetation requirements for **WSA** to minimise wildlife impacts;
 - (f) describe how the rehabilitation of the site would achieve the objectives identified in Table 5 and the requirements of conditions 35A and 35B of this Schedule;
 - (g) include detailed Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan for evaluating the performance of the rehabilitation of the site;
 - (h) include procedures for the use of interim stabilisation and temporary vegetation strategies, where reasonable to minimise the area exposed for dust generation;
 - (i) to the maximum extent practicable, build on and integrate with the other management plans required under this consent;
 - (j) include a life of mine rehabilitation and mining schedule and a protocol for progressive reviews of key progressive rehabilitation milestones from the commencement of operations through to decommissioning and mine closure;
 - (k) an overview of the identified risks to achieving successful rehabilitation and strategies to be implemented to address these risks;
 - (l) include a program to monitor, audit and report on the progress against the Rehabilitation Objectives and Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan; and
 - (m) describe the measures to be implemented to ensure compliance with the relevant conditions of this **consent**, including intervention and adaptive management techniques that may be required to ensure rehabilitation remains on a trajectory of achieving the Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan as soon as reasonably practical.

Note: The Rehabilitation Management Plan may be combined with a Mining Operations Plan, or similar plan, required under the mining lease granted for the development.

VISUAL

37. The **Applicant** must implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the **development** to the satisfaction of the Secretary.
- 37A. Within 3 months of commencing quarrying operations in Pit 3, the **Applicant** must construct landscaped earthen bunds and plant vegetation screens (as shown conceptually in Appendix 3), to minimise the visual impacts of the **development**. The landscaped earthen bunds and plant vegetation screens must be maintained until Pit 3 area has been fully rehabilitated.
- 37B. Within 6 months of the Secretary being advised of the confirmed Eastern Ring Road alignment, as required under condition 25C of this Schedule, the **Applicant** must construct landscaped earthen bunds and plant vegetation screens around the brickmaking facility and raw material stockpile (as shown conceptually in Appendix 3), to minimise the visual impacts of the **development**. The landscaped earthen bunds and plant vegetation screens must be maintained for the life of the **development**.

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- 37C. The **Applicant** must ensure that all outdoor and external lighting at the site:
- (a) complies with AS4282 (INT) 1995 – *Control of Obtrusive Effects of Outdoor Lighting*; and
 - (b) is designed in accordance with any Civil Aviation Safety Authority requirements for the WSA and is mounted, screened and directed in such a manner that it does not cause distraction or confusion to pilots due to light spill above the horizontal plane.

Visual Impact Management Plan

- 37D. Within 6 months of approval of Modification 3 and 4, the **Applicant** must prepare a Visual Impact Management Plan for the **development** to the satisfaction of the Secretary. This plan must:
- (a) be prepared by a suitably qualified and experienced person/s;
 - (b) be prepared in consultation with Council, TfNSW and relevant WSA authorities;
 - (c) describe the measures to be implemented to minimise the visual, landscaping and off-site lighting impacts of the **development** to the WSA and surrounding community;
 - (d) include a landscaping strategy to shield public views of the **development** (including views from the Eastern Airport Ring Road) that includes:
 - the measures identified in the EA (Mod 3 and 4);
 - a vegetation strategy utilising a diversity of local provenance tree species from the native vegetation community (or communities) that occur, or once occurred on the site, and would minimise wildlife attraction;
 - a bund vegetation and maintenance schedule; and
 - procedures to notify, consult with and implement site-specific mitigation measures at affected privately-owned residences; and
 - (e) include a program to monitor and report on the implementation and effectiveness of the mitigation measures; and
 - (f) include a protocol to update the plan to include the requirements of condition 37A and 37B of this Schedule, once the Secretary has been advised of the confirmed Eastern Ring Road alignment, as required under condition 25C of this Schedule.

The **Applicant** must implement the Visual Impact Management Plan as approved by the Secretary.

WASTE

38. The **Applicant** must:
- (a) manage on-site sewage treatment and disposal to the satisfaction of Council;
 - (b) minimise the waste generated by the **development**;
 - (c) ensure that the waste generated by the **development** is appropriately stored, handled, and disposed of; and
 - (d) report on waste management and minimisation, including management of non-recyclable materials in the Annual Review, to the satisfaction of the Secretary.

Note: Approval pursuant to Section 68 of the Local Government Act 1993 is required from Council for onsite sewage management systems.

39. Except as expressly permitted in an EPL and/or the conditions of this **consent**, the **Applicant** must not receive waste on the site for storage, treatment, processing, reprocessing or disposal.

Fill Management Plan

- 39A. Prior to the import of **Fill** to the site, the **Applicant** must prepare a **Fill** Management Plan for the **development** to the satisfaction of the Secretary. This plan must:
- (a) identify the quantities of **Fill** to be imported to site;
 - (b) describe:
 - the procedures for monitoring **Fill** imported to the site to ensure that it meets relevant quality specifications for VENM or ENM;
 - a protocol to prevent materials that fail to meet the requirements of the ENM Exemption and ENM Order from being accepted;
 - the management of reject materials;
 - management measures for the emplacement and temporary stockpiling of **Fill**;
 - the process for handling **Fill** for use in rehabilitation;
 - measures for the on-site use of water captured in sediment basins to ensure that the water does not present a contamination risk; and
 - processes for assessing, recording, handling and managing any contamination found on the site; and

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- (c) provide an indicative schedule of Fill material to be imported to the site for each Phase of the development, in order to achieve the conceptual final landform.

The Applicant must implement the Fill Management Plan as approved by the Secretary.

LIQUID STORAGE

- 40. The Applicant must ensure that all tanks and similar storage facilities (other than for water) are protected by appropriate bunding or other containment, in accordance with the relevant Australian Standards.

DANGEROUS GOODS

- 41. The Applicant must ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

FIRE SAFETY

- 42. The Applicant must:
 - (a) ensure that the development is suitably equipped to respond to any fires on site;
 - (b) assist the emergency services to the extent practicable if there is a fire in the vicinity of the site; and
 - (c) ensure that the development provides for asset protection in accordance with the relevant requirements in *Planning for Bushfire Protection 2019* (NSW RFS 2019).

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SCHEDULE 4 ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

1. As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing:
 - (a) an exceedance of any criteria in Schedule 3, the **Applicant** must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the **development** is again complying with the relevant criteria; and
 - (b) an exceedance of any air quality criteria in Schedule 3, the **Applicant** must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).

INDEPENDENT REVIEW

2. If a landowner considers the **development** to be exceeding the relevant criteria in Schedule 3, they may ask the Secretary in writing for an independent review of the impacts of the **development** on their land.

If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review.

If the Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Secretary and the landowner, of the Secretary's decision, the **Applicant** must:

- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the **development** is complying with the relevant criteria in Schedule 3; and
 - if the **development** is not complying with these criteria, then identify measures that could be implemented to ensure compliance with the relevant criteria;
 - (b) give the Secretary and landowner a copy of the independent review; and
 - (c) comply with any written requests made by the Secretary to implement any findings of the review.
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SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The **Applicant** must prepare an Environmental Management Strategy for the **development** to the satisfaction of the Secretary. This strategy must:
 - (a) be submitted to the Secretary for approval within 6 months of the determination of **Modification 3 and 4**, unless otherwise agreed by the Secretary;
 - (b) provide the strategic framework for environmental management of the **development**;
 - (c) identify the statutory approvals that apply to the **development**;
 - (d) **set out** the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the **development**;
 - (e) **set out** the procedures to be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the **development**;
 - receive, record, handle and respond to complaints;
 - resolve any disputes that may arise during the course of the **development**;
 - respond to any non-compliance **and any incident**; and
 - respond to emergencies; and
 - (f) include:
 - references to any strategies, plans and programs approved under the conditions of this **consent**; and
 - a clear plan depicting all the monitoring to be carried out under the conditions of this **consent**.

The **Applicant** must implement any Environmental Management Strategy as approved by the Secretary.

Evidence of Consultation

2. Where the conditions of this **consent** require consultation with an identified party, the **Applicant** must:
 - (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and
 - (b) provide details of the consultation undertaken, including:
 - the outcome of that consultation, matters resolved and unresolved; and
 - details of any disagreement remaining between the party consulted and the **Applicant** and how the **Applicant** has addressed any unresolved matters.

However, if the Secretary agrees, a strategy, plan or program may be prepared without consultation being undertaken with an identified party required under a condition of this **consent**.

Management Plan Requirements

3. The **Applicant** must ensure that the management plans required under this **consent** are prepared in accordance with any relevant guidelines, and include:
 - (a) a summary of relevant background or baseline data;
 - (b) a description of:
 - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
 - any relevant limits or performance measures/criteria; and
 - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the **development** or any management measures;
 - (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
 - (d) a program to monitor and report on the:
 - impacts and environmental performance of the **development**; and
 - effectiveness of any management measures (see (c) above);
 - (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;
 - (f) a program to investigate and implement ways to improve the environmental performance of the **development** over time;
 - (g) a protocol for managing and reporting any:

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- incidents;
 - complaints; and
 - non-compliances with statutory requirements;
- (h) a protocol for periodic review of the plan; and
- (i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.

Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.

Application of Existing Strategies, Plans and Programs

4. The **Applicant** must continue to apply existing management plans, strategies or monitoring programs approved prior to the approval of **Modification 3 and 4**, until the approval of a similar plan, strategy or program following the approval of **Modification 3 and 4**.

Revision of Strategies, Plans & Programs

5. Within 3 months of:
- (a) the submission of an incident report under condition 10 below;
 - (b) the submission of an Annual Review under condition 12 below;
 - (c) the submission of an Independent Environmental Audit report under condition 14 below; and
 - (d) the approval any modifications to this **consent**,
- the **Applicant** must review the suitability of all strategies, plans and programs required under this **consent**, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary.

Notes:

- The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the **development**.
- In the event of an inconsistency between condition 5(d) above and any condition in Schedule 3 of this **consent**, the latter prevails.

Updating and Staging of Strategies, Plans or Programs

6. With the approval of the Secretary, the **Applicant** may:
- (a) prepare and submit any strategy, plan or program required by this **consent** on a staged basis (if a clear description is provided as to the specific stage and scope of the **development** to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program);
 - (b) combine any strategy, plan or program required by this **consent** (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and
 - (c) update any strategy, plan or program required by this **consent** (to ensure the strategies, plans and programs required under this **consent** are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the **development**).

Adaptive Management

7. The **Applicant** must assess and manage **development**-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this **consent** and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

Where any exceedance of these criteria and/or performance measures has occurred, the **Applicant** must as soon as becoming aware of any exceedance:

- (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur;
 - (b) consider all reasonable and feasible options for remediation (where relevant);
 - (c) within 14 days of the exceedance occurring, submit a report to the Secretary describing these remediation options and any preferred remediation measures or other course of action; and
 - (d) implement remediation measures as directed by the Secretary;
- to the satisfaction of the Secretary.

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COMMUNITY CONSULTATIVE COMMITTEE

8. The **Applicant** must establish and operate a Community Consultative Committee (CCC) for the **development** to the satisfaction of the Secretary. The CCC must be established prior to recommencing quarrying operations and be operated in general accordance with the Department's *Community Consultative Committee Guidelines, November 2016* (or later version).

Notes:

- The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the **Applicant** complies with this **consent**.
- In accordance with the guidelines, the Committee should comprise an independent chair and appropriate representation from the **Applicant**, Council and the local community.
- The **Applicant** may, with the approval of the Secretary, combine the function of this CCC with the functions of other CCCs in the area.

REPORTING AND AUDITING

Incident Notification

9. The **Applicant** must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be made in writing through the Department's Major Projects Website and identify the **development** (including the development application number and name) and set out the location and nature of the incident.

Non-Compliance Notification

10. Within seven days of becoming aware of a non-compliance, the **Applicant** must notify the Department of the non-compliance. The notification must be made in writing through the Department's Major Projects website and identify the **development** (including the development application number and name), set out the condition of this **consent** that the **development** is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.

Regular Reporting

11. The **Applicant** must provide regular reporting on the environmental performance of the **development** on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this **consent**.

Annual Review

12. Prior to recommencing quarrying operations or **Fill import**, and annually thereafter, the **Applicant** must submit a review to the Department reviewing the environmental performance of the **development** to the satisfaction of the Secretary. This review must:
- (a) describe the **development** (including any progressive 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, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - requirements of any plan or program required under this **consent**;
 - monitoring results of previous years; and
 - relevant predictions in the documents listed in condition 3 of Schedule 2;
 - (c) evaluate and report on:
 - the effectiveness of the air quality and noise management systems; and
 - compliance with the performance measures, criteria and operating conditions in this **consent**.
 - (d) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to **rectify the non-compliance and avoid reoccurrence**;
 - (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

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

The **Applicant** must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 8 of Schedule 5) and any interested person upon request.

INDEPENDENT ENVIRONMENTAL AUDIT

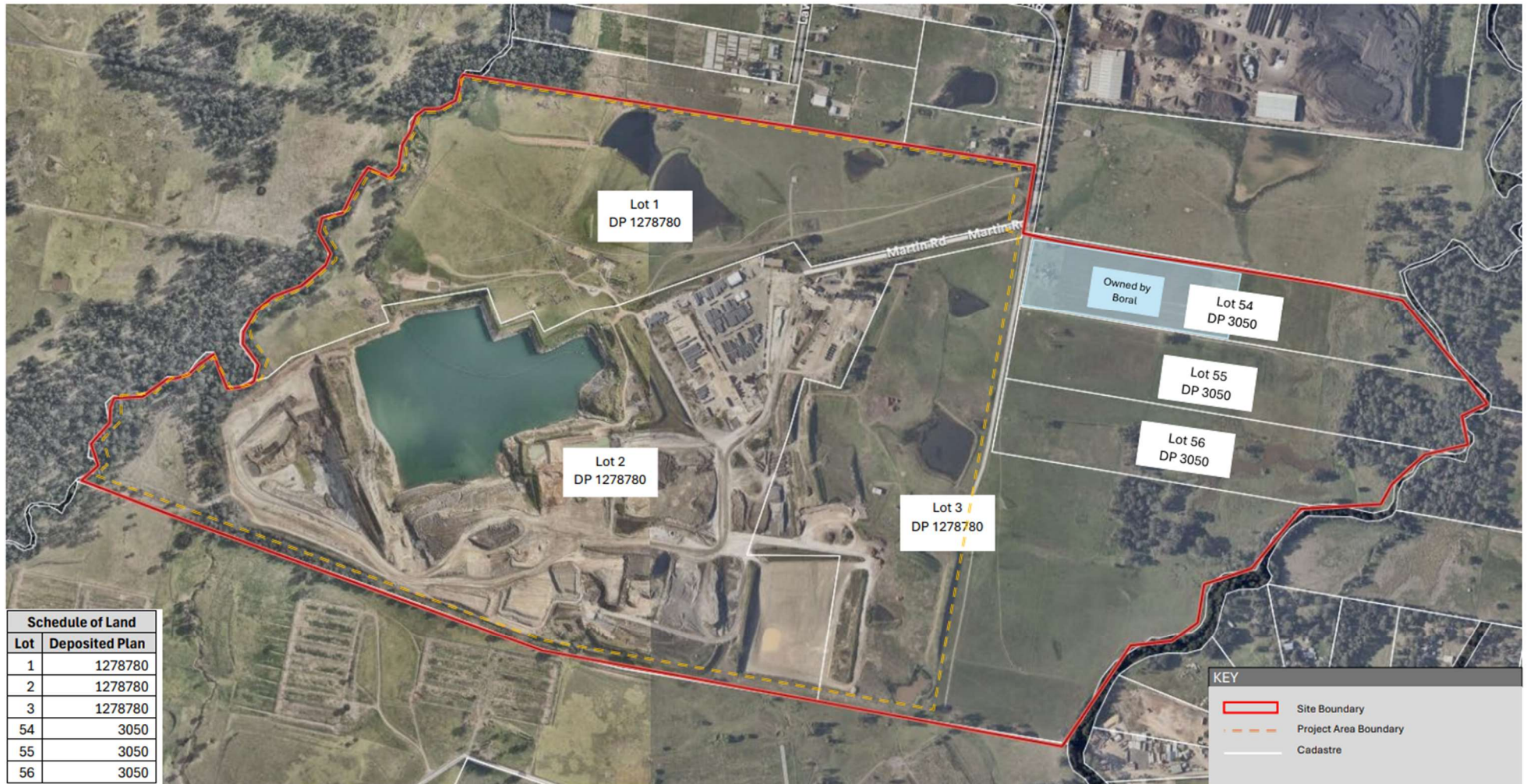
13. Within 12 months of **the commencement of Phase 1**, and every 3 years thereafter, unless the Secretary directs otherwise, the **Applicant** must commission, commence and pay the full cost of an Independent Environmental Audit of the **development**. This audit must:
- (a) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
 - (b) include consultation with the relevant agencies and the CCC;
 - (c) assess the environmental performance of the **development** and whether it is complying with the relevant requirements in this **consent** and any relevant EPL or necessary water licences for the **development** (including any assessment, strategy, plan or program required under these approvals);
 - (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals;
 - (e) recommend appropriate measures or actions to improve the environmental performance of the **development**, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and
 - (f) be conducted and reported to the satisfaction of the Secretary.
14. Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the **Applicant** must submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of these recommendations as required. The **Applicant** must implement these recommendations, to the satisfaction of the Secretary.
- 14A. Any condition of this **consent** that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit.

Note: For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the **consent** or on the environmental impact of the **development**, and an "environmental audit" is a periodic or particular documented evaluation of the **development** to provide information on compliance with the **consent** or the environmental management or impact of the **development**.

ACCESS TO INFORMATION

15. Within 3 months of the determination of **Modification 3 and 4**, until the completion of all works, including rehabilitation and remediation the **Applicant** must:
- (a) make the following information publicly available on its website:
 - the documents listed in condition 3 of Schedule 2;
 - current statutory approvals for the **development**;
 - all approved strategies, plans and programs required under the conditions of this **consent**;
 - regular reporting on the environmental performance of the **development** in accordance with the reporting arrangements in any plans or programs approved under the conditions of this **consent**;
 - a comprehensive summary of the monitoring results of the **development**, reported in accordance with the specifications in any conditions of this **consent**, or any approved plans and programs;
 - summary of the current stage and progress of the **development**;
 - contact details to enquire about the **development** or to make a complaint;
 - a complaints register, updated at least monthly;
 - the Annual Reviews of the **development**;
 - any Independent Environmental Audit as described in condition 13 above, and the **Applicant's** response to the recommendations in any audit; and
 - any other matter required by the Secretary; and
 - (b) keep this information up-to-date,
- to the satisfaction of the Secretary.

APPENDIX 1 SCHEDULE OF LAND



APPENDIX 2 LAND OWNERSHIP SURROUNDING THE DEVELOPMENT



Figure 1: Receiver ID

CONSOLIDATED CONSENT

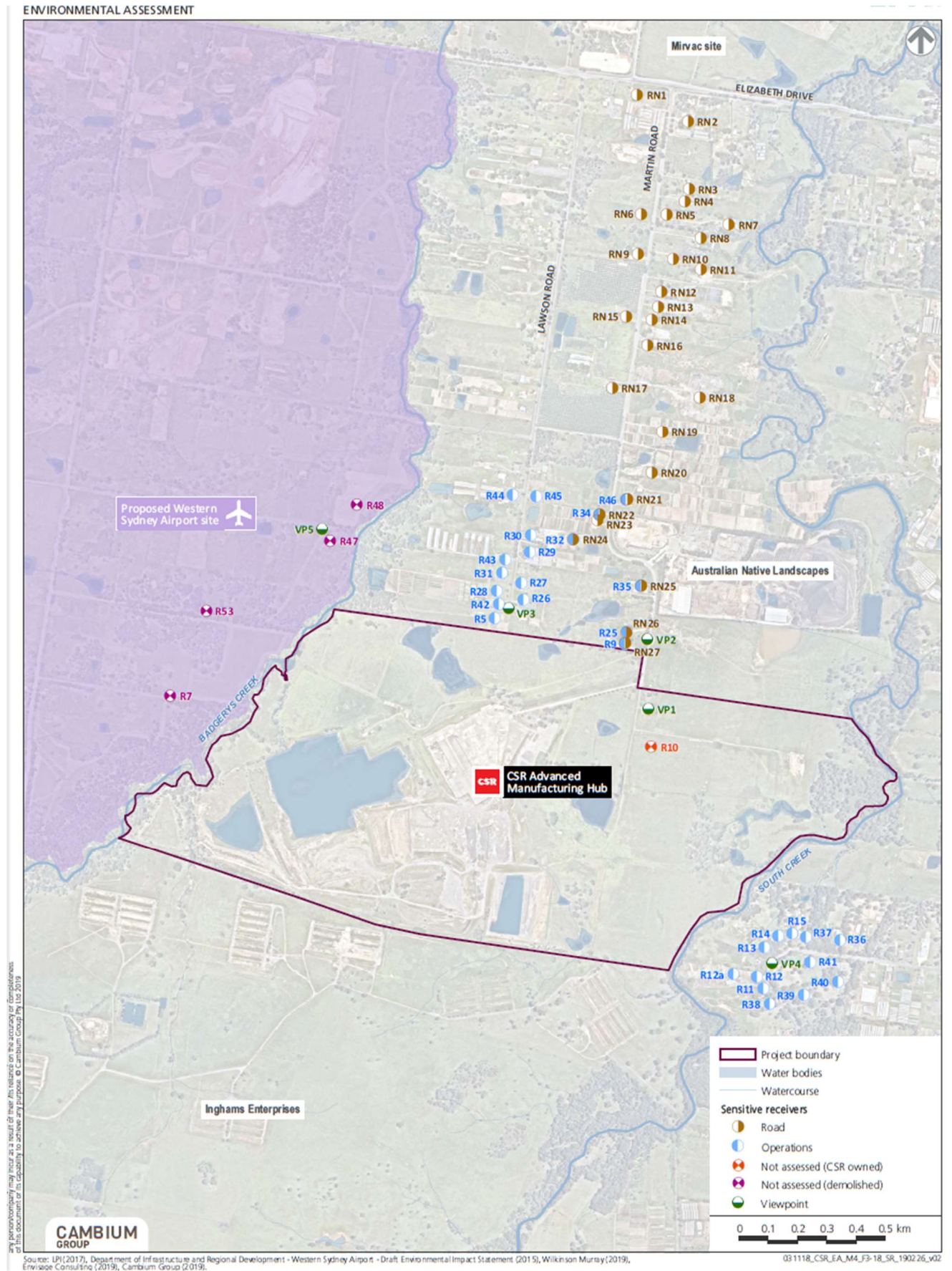


Figure 2: Road Noise Receiver ID

APPENDIX 3 DEVELOPMENT LAYOUT PLANS



Figure 1: Development Layout Overview



Figure 2: Phase 1 Development Layout



Figure 3: Phase 2 Development Layout



Figure 4: Phase 3 Development Layout



Figure 5: Phase 4 Development Layout

APPENDIX 4 REHABILITATION PLAN

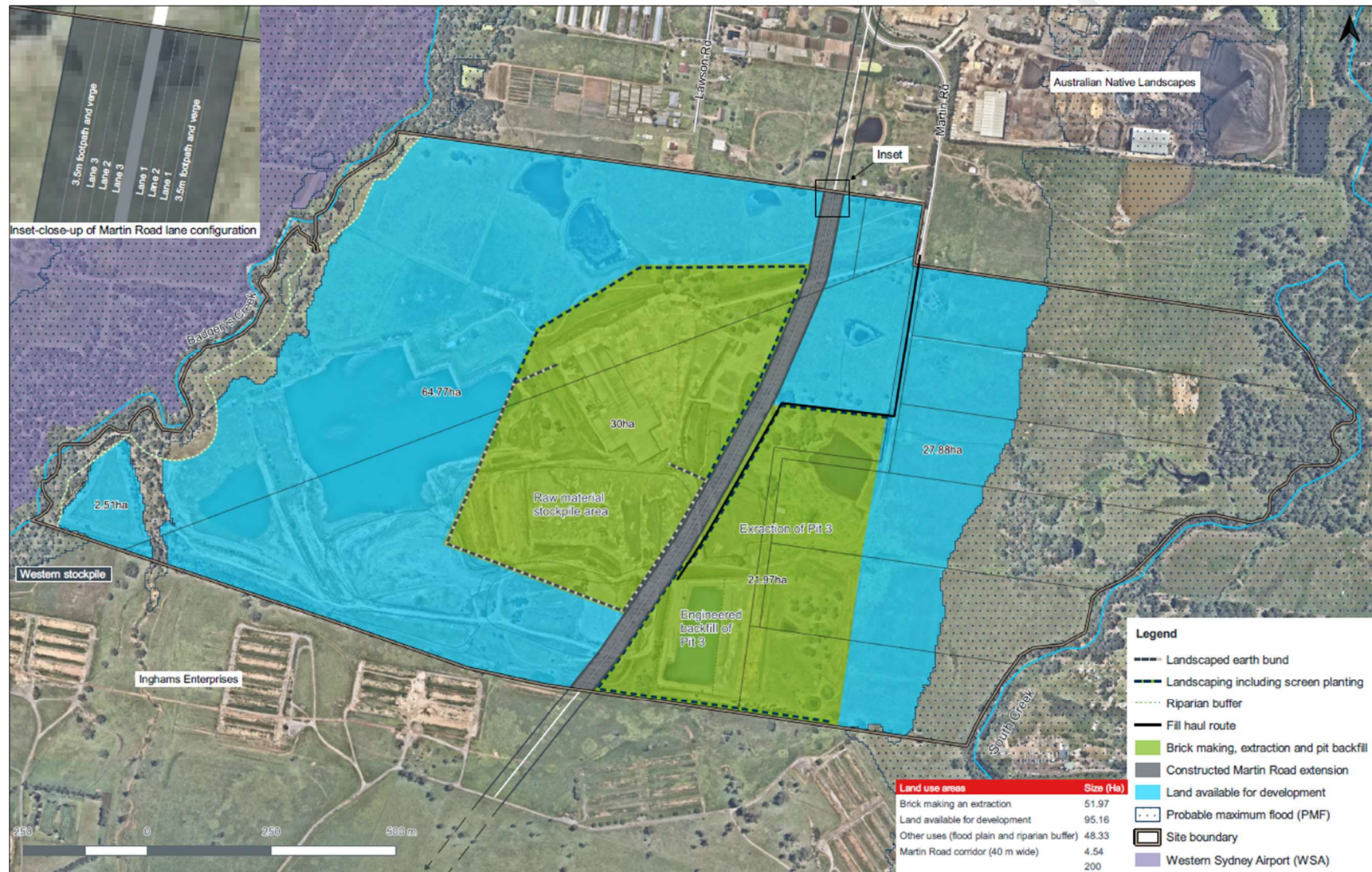


Figure 1: Phase 2 Rehabilitation

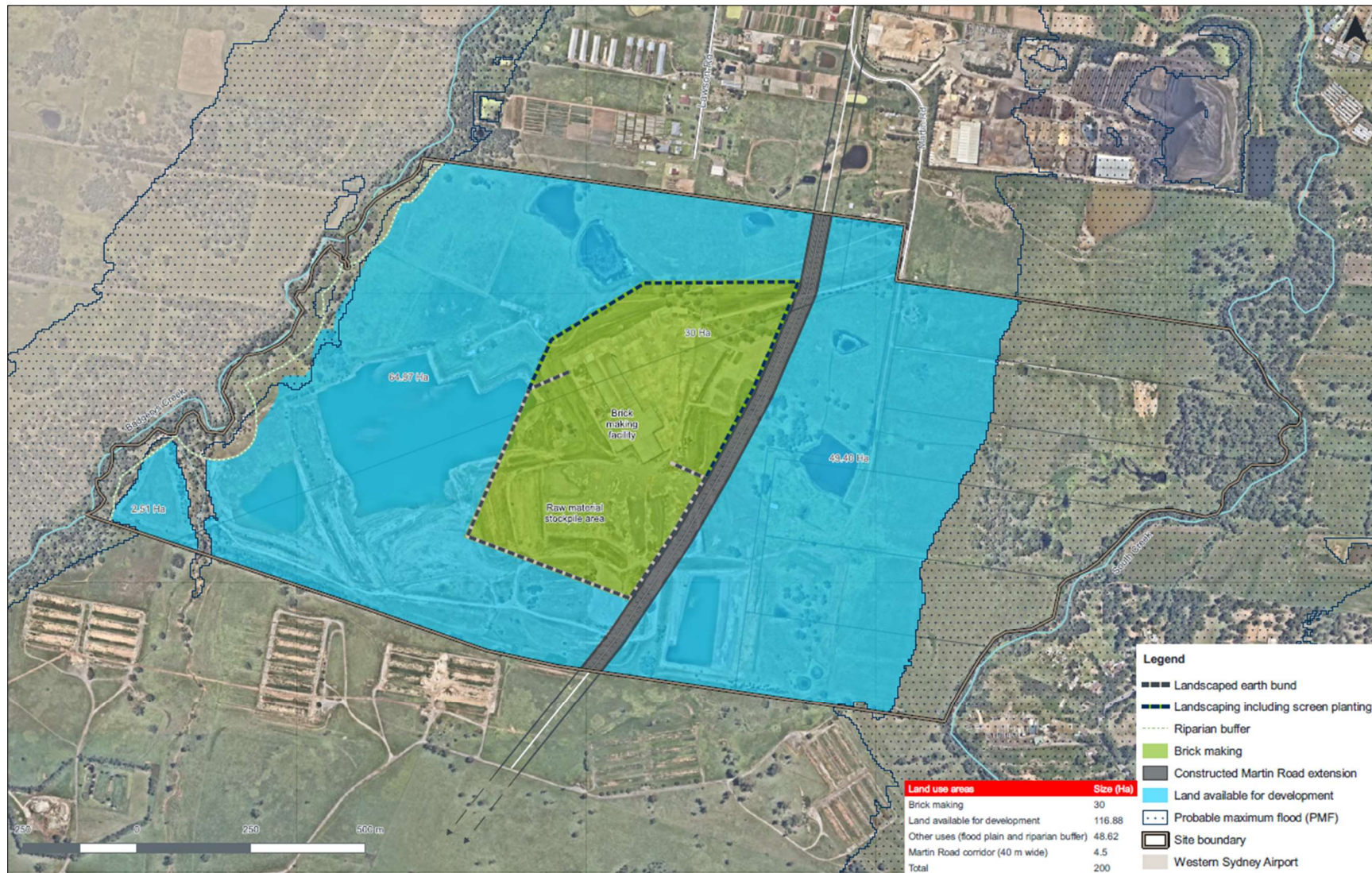


Figure 2: Phase 4 Rehabilitation

APPENDIX 5 ARCHAEOLOGICAL DEPOSIT AVOIDANCE ZONE



APPENDIX 6 STATEMENT OF COMMITMENTS

Issue	Commitment
General	1. The Applicant shall implement all practicable measures to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the development. 2. CSR will apply to amend EPL 684 to reflect the development. 3. The environmental management strategy and sub plans will be amended to reflect the development.
Air Quality	4. The Applicant will prepare an Air Quality and Green House Gas Management Plan (AQGHGMP) for the development to the satisfaction of the Secretary. The AQGHGMP will outline the purpose, methodology and expected outcomes of the dust monitoring, and will include the following content: ▪ Dust fraction to be measured, i.e. TSP, PM₁₀, PM_{2.5} etc.; ▪ Equipment to be used to measure selected dust fraction; ▪ Frequency of the monitoring, i.e. sample collection schedule; ▪ Duration of the monitoring program; ▪ Location of the monitoring station/s; ▪ Standards/guidelines that are to be followed for location/construction of the monitoring station, equipment calibration, collection of samples and analysis of samples; ▪ Calibration methodology and schedule; ▪ Reporting procedure; ▪ Regulatory guidelines and compliance criteria; ▪ Action levels and contingency measures in the event that pollutant concentrations approach or are likely to exceed the relevant compliance criteria; and ▪ A consultation program that involves nearby agricultural producers and residents, in order to determine if the dust mitigation measures are being effective. 5. The AQGHGMP will detail measures to control dust and emissions from the Project Site including the following measures: ▪ Haul roads should be watered using water carts such that the road surface has sufficient moisture to minimise visible on-road dust generation but not so much as to cause pooling and mud/dirt track out to occur ▪ Unloading of trucks containing raw or unusable extracted material to be controlled using water sprays/dust suppression when generating excessive visible dust. ▪ Dust from existing stockpiles of unusable material and open pits to be controlled using water sprays with chemical additives (surfactants); ▪ Completed pits to be revegetated as soon as practicable after completion of quarrying activities. ▪ Disturbed soil surfaces to be revegetated in accordance with the RMP for the Project Site. ▪ Operational practices to be reviewed to ensure 'best practice' techniques are being employed and that operational equipment is working efficiently. 6. The existing HVAS will be moved to as close to the northern boundary of the property and the closest sensitive receiver as possible. 7. The existing deposited dust gauges will be relocated to appropriate positions as close to the property boundaries and nearest sensitive receivers as possible. 8. If HVAS and deposited dust air quality monitoring identifies ongoing exceedances of the relevant air quality criteria then the reactive dust management program may need to be reinstated at the site.
Noise	9. The Applicant will implement all practicable measures to undertake the development in a way that minimises the noise generated. The Applicant has made the following commitments in relation to operation noise management: 10. The Applicant will conduct quarrying activities at the Project Site only between the following hours: ▪ 7.00 am to 6.00 pm Monday to Saturday. 11. The Applicant will remove overburden only between the following hours: ▪ 7.00 am to 6.00 pm Monday to Saturday. 12. The Applicant will operate the Brick making facility and storage yard at the Project Site 24 hours a day, Monday to Sunday. 13. The Applicant will receive and dispatch finished building products only between the following hours: ▪ 5.00 am to 10.00 pm Monday to Friday. ▪ 6.00 am to 6.00pm Saturday. 14. The Applicant will receive and dispatch raw material only between the following hours: ▪ 6.00 am to 10.00 pm Monday to Friday. ▪ 6.00 am to 6.00pm Saturday. 15. The Applicant will conduct cash sales only between the following hours: ▪ 6.00 am to 6.00 pm Monday to Saturday.

Issue	Commitment
	16. The Applicant will operate the sales selection/customer display centre only between the following hours: 8.00 am to 5.00 pm Monday to Sunday. 17. Construction works shall be limited to 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays. 18. A CNVMP will be prepared and implemented during development construction. 19. The construction noise mitigation measures described in Chapter 5.5 of the preferred development noise impact assessment report (appended to the RTS) shall be implemented. 20. Vibration during construction will be managed through the CNVMP to ensure that vibration impacts comply with the limits prescribed in British Standard BS 7385 for structural damage and in Assessing Vibration: a technical guide (DECCW, 2006) for human response. 21. The Applicant and/or its appointed contractors will select and maintain bulk earthwork machinery as specified in the preferred development noise impact assessment report (appended to the RTS). 22. Broadband reversing alarms or other non-tonal vehicle movement and warning alarms shall be fitted to all machinery on site. The potential noise impact associated with reversing alarms shall be managed and minimised via a combination of proactive driver/operator training and operational procedures. 23. The Applicant shall implement a noise monitoring programme which would involve quarterly attended noise monitoring at a number of nearby identified receiver locations for 12 months after all Modification 3 and 4 activities are in full operation. If there are no exceedances of the project noise trigger levels during quarterly noise monitoring during the first year of monitoring then noise monitoring will cease. Additional noise monitoring would be undertaken in response to any noise complaints. 23. The Applicant shall undertake consultation with identified Martin Road residential receivers predicted to exceed the RNP criteria and conduct further investigation of their residences (as detailed in Section 2.3.3 and 4.1 of the RTS) to determine whether they qualify for and require the 'Type 1' treatment package from RMS's (2015) <i>At-receiver Treatment Guideline</i>. 24. Further investigations of the six residences potentially affected by road noise will be undertaken prior to increasing heavy vehicle movements along Martin Road above the approved heavy vehicle numbers and no greater than 180 truck movements in the daytime period. The investigation will determine whether the residences require the 'Type 1' treatment package from RMS's (2015) <i>At-receiver Treatment Guideline</i>. 25. Prior to construction of the Martin Road-Elizabeth Drive intersection, existing road noise levels would be qualified to determine if architectural treatment should be offered to receivers along Elizabeth Drive raising complaints about increased road noise levels. 26. The Applicant will maintain a noise complaint register.
Surface Water	Stormwater management 27. The Applicant shall manage surface water on the Project Site in accordance with the WMP prepared for the Project Site and revised for the development, including surface water management measures include in the Modification 3 and 4 EA and the RTS. 28. If during the operational phase of the quarry or on completion of the quarry operations, the Applicant wishes to make use of the water from the pits/dams in the brick making process or for reuse at other premises offsite etc, a licence will be obtained from DPIE. 29. Sediment basins 4, 5 and 6 and the new basins at the raw material stockpile area and Pit 3 will be sized and operated in accordance with Landcom's (2004) <i>Managing Urban Stormwater: Soils & Construction</i>. If any of these basins are to be modified to perform additional stormwater treatment functions in future (other than sediment capture), then appropriate modelling and design of the basins will be required at that time. In this case monitoring of discharges from the basin at Pit 3 to South Creek will be required. 30. The site WMP will be revised prior to commencement of the modification to include the revised surface water management approach, and monitoring of any water discharged from the site. Monitoring 31. Electrical conductivity, pH, total nitrogen, total suspended solids, turbidity, total alkalinity, arsenic and copper will be monitored at the discharge points to Badgerys Creek and South Creek. Discharges will be monitored daily during the first month of continuous discharge, then weekly if the first month of data does not exceed concentration limits. Monitoring will revert to daily if any limits are exceeded and/or concentrations are reduced below limits.

Issue	Commitment
	32. Total dissolved solids, total phosphorus, arsenic, cadmium, chromium, lead, nickel, zinc and mercury will be sampled weekly during the first two months, which will reduce to monthly if there are no exceedances. 33. The analytes previously sampled in Pit 1 will be monitored at three depth levels from the surface to 6 m at two locations near the discharge point to Badgerys Creek. Water will be monitored weekly for three weeks prior to discharge, then monthly. This monitoring will continue for the life of the development, and in the perched treatment basin described above. 34. Similar sampling is also required for the new basin at Pit 3 if the basin is being used to treat Pit 3 water (other than sediment capture). The list of analytes may be able to be reduced according to the future quality of stormwater collected in Pit 3. Licensing and approvals 35. CSR will apply to the EPA to amend the EPL to incorporate the discharge rates and concentration limits for relevant physical and chemical stressors, and toxicants, at the discharge point to Badgerys Creek. 36. CSR will apply to the EPA to amend the EPL, if and when required, to incorporate appropriate discharge rates and concentration limits for discharges from the basin at Pit 3, for which time the basin provides additional water treatment other than sediment capture. 37. CSR will consult DPIE Water on the need for water licenses associated with the modification. 38. The EPA will be engaged, post approval, to determine whether the pit water must be classified in terms of the Protection of the Environment Operations Act 1997 (POEO Act) and to include the discharge point in the EPL. Erosion and sediment control 39. Erosion and sediment controls will be implemented at the pit areas once they are filled with Fill and rehabilitation has commenced. These measures will remain in place until surfaces are fully stabilised. 40. Erosion and sediment controls will be implemented along the unsealed Fill haul road, which will direct runoff to the pits or local sediment traps.
Groundwater	41. The Applicant shall prepare and implement a Groundwater Monitoring Program for the Project Site generally in accordance with the methodology provided in Chapter 11 of the 2011 EA, subject to consultation with the DPIE (water, lands and primary industry) and the satisfaction of the Director-General of the DP&I. 42. The WMP will be updated to include the groundwater monitoring network and a TARP for exceedances of groundwater criteria, which will be developed based on the baseline groundwater data. 43. The Applicant shall report the results of the Groundwater Monitoring Program to the Secretary of the DPIE on an annual basis. 44. The Applicant shall implement appropriate management measures in relation to groundwater as indicated by the Monitoring Program and agreed with the Secretary. 45. A licence to authorise any groundwater monitoring installation, required as part of this development, shall be obtained from the DPIE Water prior to any drilling commencing. 46. The Applicant shall implement an alluvial aquifer mapping and assessment program to inform: ▪ The definition of the boundaries of the alluvial system. ▪ Adjustment to the extent of proposed pits to avoid impacts to the alluvial aquifer. ▪ The establishment of further mitigation measures (if required) to minimise potential impacts upon the alluvial aquifer. ▪ This program will commence within 12 months of recommencing quarrying operations and the results will be reported to the Secretary of the DPIE.
Rehabilitation	47. The site will be progressively rehabilitated in accordance with the approved rehabilitation strategy and rehabilitation management plan. 48. The rehabilitation strategy and rehabilitation management plan will be revised to incorporate the development, and any additional management strategies to ensure temporary stabilisation of exposed surfaces, permanent stabilisation strategies and progressive rehabilitation with groundcover vegetation. 49. The rehabilitation management plan will be revised to exclude plant species that are known to attract wildlife and grow to a size which will penetrate the OLS. 50. The Applicant shall carry out rehabilitation works at the Project Site in accordance with the RMP prepared for the Project Site. 51. The Applicant will prepare a Final Landform Rehabilitation Plan in consultation with the DPIE two years prior to the completion of all approved quarrying activities.
Traffic and Transport	52. The Applicant shall manage traffic movements to and from the Project Site generally in accordance with the following:

Issue	Commitment
	▪ Personnel operating trucks and vehicles to and from the Project Site would be required to undertake a site-specific health and safety induction, specifying operating hours and vehicle speed limits on Martin Road. ▪ A heavy vehicle protocol would be developed for the Project Site and distributed to relevant staff and contractors during induction procedures. The protocol would deal with such issues as timing of vehicle movements, idling of vehicles, speed limits and parking. ▪ Unnecessary vehicle movements would be minimised where possible. ▪ Deliveries would be scheduled on larger capacity 'Truck and Trailer' vehicles rather than 'Truck Only' vehicles where possible to minimise truck movements. ▪ A construction traffic management plan will be prepared and implemented to manage impacts on the road network, including the intersection, from construction vehicles. ▪ Traffic signals and road upgrades will be constructed at the Martin Road-Elizabeth Drive intersection prior to increasing heavy vehicle movements from the development above the approved heavy vehicle numbers. ▪ CSR will contribute to the upgrade and ongoing maintenance of Martin Road in accordance with the deed of agreement with LCC.
Cultural Heritage	53. The Applicant shall adopt the following measures in relation to the management of cultural heritage on the Project Site: ▪ The heat retainer hearth will continue to be protected by a fenced 10m exclusion zone. ▪ All Aboriginal heritage items collected during survey and test excavations will be reburied with the hearth in consultation with the RAPs. ▪ Should Aboriginal heritage items be uncovered during the course of the approved works, works shall cease. In cases where historical items have been uncovered, Heritage NSW is to be advised or should indigenous items be uncovered the National Parks and Wildlife Service shall be advised. ▪ Workers/contractors shall be informed of their obligations under the NPW Act 1974, namely that it is illegal to disturb, damage or destroy an Aboriginal object without the prior approval of the Secretary of DPC. ▪ Should human remains be found in, on, or under the land during construction, the responsible party shall: - Contact the local police. - Not disturb or excavate the remains. - Immediately cease all work at the particular location. - Notify the Heritage NSW (DPC) office as soon as practicable and provide any available details of the remains and their location. - Not recommence any work at the particular location until authorised in writing by the Heritage NSW. 54. The AHMP will be updated with the findings of the Modification 4 ACHA.
Ecology	55. The Applicant shall adopt the following measures in relation to the removal of any trees on the Project Site: ▪ The canopy of the trees to be visually inspected prior to clearing to assess for the presence of fauna. Where bird species are detected the tree is to be nudged prior to felling to encourage the fauna to vacate the tree prior to felling. Trees to be left in situ until the birds leave the canopy. ▪ Felled trees are to be left in-situ for at least 24 hours to allow fauna species to relocate. Qualified personnel are to be on hand to check for wildlife and relocate them. ▪ Felled wood is to be relocated to the remnant woodland (and not placed in piles) or chipped and used in rehabilitation areas. ▪ Should any wildlife be inadvertently injured during the proposed works, WIRES or an accredited veterinarian shall be contacted. ▪ A 60 m buffer area shall be provided along Badgerys Creek and the Badgerys Creek tributary, except where Pit 2 extends into these buffers. Rehabilitation works are to be undertaken in this area in accordance with the RMP. ▪ Five local native trees shall be planted for each mature native tree that is removed. The replacement trees shall consist of a diversity of local provenance tree species from the native vegetation community (or communities) that occur, or once occurred on the site. The plantings shall be located adjacent to the riparian vegetation along South Creek, Badgerys Creek and its tributary.
Aquatic biodiversity	56. A 40 m vegetated riparian zone will be maintained around the wetland adjacent to South Creek and 20 m zone will be maintained around the tributary to Badgerys Creek (except over Pit 2). 57. As the hydraulic modelling for the surface water assessment was indicative, geomorphology will be assessed in greater detail to validate the bed and bank materials of Badgerys Creek prior to finalisation of the pit dewatering strategy. This

Issue	Commitment
	will include quantification of bed and bank material and particle size and calculation of critical shear stress for the bed and bank to determine its sensitivity to erosion. 58. If the bed and bank materials are demonstrated to be sensitive to erosion, the optimum flow rate that can be achieved without impacting the creek bed and banks will be determined in a sediment transport model. 59. It will be necessary to gain further water quality and flow data to determine the impact of discharges on Badgerys Creek. Water quality will be monitored every month at the four Badgerys Creek and South Creek monitoring locations as described in Section 6.3.2 of the EA. This will include nitrogen speciation to determine which portion of nitrogen is bioavailable and could impact aquatic ecosystems. 60. A biological monitoring program will be developed to detect if the macroinvertebrate community is changed by exposure to discharge water. An in-stream vegetation monitoring program will be prepared and implemented to detect if the discharge is impacting vegetation community composition and mortality. 61. Monitoring for changes to instream vegetation and macroinvertebrates will be incorporated into a pit dewatering plan as a sub-plan to the existing water management plan. 62. CSR will compile a fauna relocation plan. This plan will develop strategies for aspects such as transferring aquatic fauna, acclimatising aquatic fauna to different water conditions and managing pest species. DPIE will be consulted during the development of this strategy.
Contamination	63. The potential presence of asbestos in the eastern edge of Pit 1 will be added to the site Asbestos Register. 64. A materials management plan will be prepared to ensure that surface water, backfilled material and imported soils are handled appropriately, do not pose a risk to human health or the environment and will be suitable for the proposed land use. The plan will provide procedures to appropriately quantify, classify, dispose of and report on potential contaminants. 65. A UFP will be prepared, providing guidance in the event that future below ground excavations identify contaminated materials (e.g. asbestos, staining, odours). The UFP will outline procedures for handling, assessing and managing any contamination that may be identified as part of Modification 4 works. If previously unidentified contaminated materials are encountered during construction and operation of the proposed modification, relevant statutory requirements, including potential soil testing and waste classification, will need to be complied with, and the material managed and disposed of appropriately. 66. Stored/stockpiled materials within the proposed disturbance footprints will be inspected and they will be recycled or disposed at facilities which can legally receive such materials. 67. Soil materials within the vicinity of the Modification 3 works will be assessed in accordance with NSW EPA (2014) <i>Waste Classification Guidelines</i> and either re-use them on site where suitable or dispose of them offsite to a landfill which can legally receive such materials. 68. Conduct a hazardous material survey on existing site structures prior to demolition/alteration activities.
Waste	69. The Applicant shall manage waste in relation to the development in accordance with the existing WMP for the Project Site. 68. (Deleted). 70. All waste generated on site will be managed in accordance with the site's waste management plan that will follow the waste hierarchy of avoid, reduce, re-use, recycle and will be updated to include development works.
Visual amenity	71. Proposed lighting at the site will still comply with Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting.
Mineral Resources	72. The Applicant will provide annual production data to the water, lands and primary industries division of the Department of Planning, Industry and Environment, as and when requested.
Environmental Management	73. The Applicant shall prepare an EMS for the Project Site to provide environmental management practices and procedures to be followed during the operation of the development. The EMS shall include, but not necessarily be limited to: ▪ identification of statutory and other obligations that the Applicant is required to fulfil in relation to operation of the development; ▪ a description of the roles and responsibilities for all key personnel involved in environmental management of the development; ▪ the environmental policies and principles to be applied to the operation of the development; and ▪ describe in general terms how the environmental performance of the development would be monitored and managed.

FOR INFORMATION

Appendix B: Mining Lease 1771

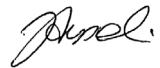
Instrument of Variation

Mining Lease 1771 (1992)

I, **JAMIE TRIPODI, Executive Director Assessments & Systems**, Mining Exploration and Geoscience in the Department of Regional NSW, with the delegated authority of the Minister under section 261B and clause 12 of Schedule 1B of the *Mining Act 1992* (the Act), **vary** the conditions of mining lease **ML 1771 (1992)** as described in Schedule A.

The conditions of **ML 1771 (1992)**, as varied, are set out in Schedule B.

The variation takes effect on 17 October 2022.



JAMIE TRIPODI

Executive Director Assessments & Systems

As delegate for the Minister administering the *Mining Act 1992*

Delegation date: 14 May 2018

Dated: 14 August 2022

Schedule A

Condition		Variation	New Condition
	Definitions	Definitions of 'Department', 'Environment' 'Environmental incident notifications and reports' and 'Harm to the environment' omitted as no longer used.	N/A
1	Notice to Landholders	Wording amended to modernise the condition	1. Notice to Landholders – see Schedule B
2	Rehabilitation	Condition omitted	N/A
3	Mining Operations Plan and Annual Rehabilitation Report	Condition omitted	N/A
4	Non-Compliance Reporting	Condition omitted	N/A
5	Environmental Incident Report	Condition omitted	N/A
7	Resource Recovery	Condition omitted	N/A
8	Security	Condition amended to modernise the wording. Condition has been re-numbered due to omission of other conditions.	2. Security– see Schedule B
9	Cooperation Agreement	Condition amended to modernise the wording. Condition has been re-numbered due to omission of other conditions.	3. Cooperation Agreement – see Schedule B
N/A		New condition attached	4. Assessable Prospecting Operations– see Schedule B
<u>SPECIAL CONDITIONS</u>			

Nil

Schedule B

Mining Lease Conditions

(Version as at February 2022)

Definitions

Words used in this mining lease have the same meaning as defined in the *Mining Act 1992* except where otherwise defined below:

Term	Definition
Act	means the <i>Mining Act 1992</i> .
Landholder	for the purposes of these conditions: • does not include a secondary landholder • includes, in the case of exempted areas, the controlling body for the exempted area.
Minister	means the Minister administering the Act.

Note:

1. The rights and duties of the Lease Holder(s) are those prescribed by the *Mining Act 1992* and the Mining Regulation 2016, subject to the terms and conditions of this mining lease.
2. This mining lease does not override any obligation on the lease holder(s) to comply with the requirements of other legislation and regulatory instruments which may apply (including all relevant development approvals) unless specifically provided under the *Mining Act 1992* or other legislation or regulatory instruments.

MINING LEASE CONDITIONS

Standard conditions

See Mining Regulation 2016, Schedule 8A, Part 2.

NOTE TO HOLDERS: The prescribed standard conditions in the Mining Regulation 2016, Schedule 8A, Part 2 apply in addition to the conditions in this Schedule 2 (but have not been replicated in this mining lease). The conditions imposed by the Mining Regulation 2016 prevail to the extent of any inconsistency with the conditions in this Schedule 2.

General conditions

1. Notice to Landholders

- (a) Within 90 days from the date of grant or renewal of this mining lease, the lease holder must give each landholder notice in writing:

- (i) that this mining lease has been granted or renewed; and
- (ii) whether the lease includes the surface.

The notice must include a plan identifying the lease area and each landholder and individual land parcel within the lease area.

- (b) If there are ten or more landholders to which notice must be given, the lease holder will be taken to have complied with condition 1(a) if a notice complying with condition 1(a) is published in a newspaper circulating in the region where the lease area is situated.

2. Security

The lease holder is required to provide and maintain a security deposit to secure funding for the fulfilment of obligations under the mining lease, including obligations under the mining lease that may arise in the future.

The amount of the security deposit to be provided has been assessed at **\$2,258,000**.

3. Cooperation Agreement

The lease holder must make every reasonable attempt, and be able to demonstrate its attempts to the satisfaction of the Secretary, to enter into a cooperation agreement with the holder(s) of any overlapping authorisations issued under the *Mining Act 1992* and petroleum titles issued under the *Petroleum (Onshore) Act 1991*. The cooperation agreement should address but not be limited to:

- access arrangements
- operational interaction procedures
- dispute resolution
- information exchange
- well location
- timing of drilling

Mining Lease Conditions 2021	Version Date: February 2022
Mining Lease 1771 (Act 1992)	Page 4 of 5

- potential resource extraction conflicts; and
- rehabilitation issues.

4. Assessable Prospecting Operations

- (a) The lease holder must not carry out any assessable prospecting operation on land over which this lease has been granted unless:
 - (i) it is carried out in accordance with any necessary development consent; or
 - (ii) if development consent is not required, the prior written approval of the Minister has been obtained.
- (b) The Minister may require the lease holder to provide such information as required to assist the Minister to consider an application for approval.
- (c) An approval granted by the Minister under this condition may be granted subject to terms.
- (d) The lease holder must comply with the approval granted to the holder under this condition.

Special conditions

Nil

Exploration Reporting

Note: Exploration Reports (Geological and Geophysical)

The lease holder must lodge reports in accordance with the requirements in section 163C of the Mining Act 1992 and clauses 59, 60 and 61 of the Mining Regulation 2016 as well as any further requirements issued by the Secretary under clause 62 of the Mining Regulation.

Guidelines for the structure, content and data format requirements for reports are set out in the Exploration Reporting: A guide for reporting on exploration and prospecting in New South Wales.

Appendix C: EPA Licence



Environment Protection Licence

Licence - 684

Licence Details	
Number:	684
Anniversary Date:	18-November

Licensee	
PGH BRICKS & PAVERS PTY LIMITED	
LOCKED BAG 1345	
NORTH RYDE NSW 1670	

Premises	
PGH BRICKS & PAVERS BADGERYS CREEK	
235 MARTIN ROAD	
BRADFELD NSW 2556	

Scheduled Activity	
Ceramic works	
Mining for minerals	

Fee Based Activity	Scale
Ceramics production	0-15000 T annual production capacity
Mining for minerals	0-30000 T annual production capacity

Contact Us	
NSW EPA	
6 Parramatta Square	
10 Darcy Street	
PARRAMATTA NSW 2150	
Phone: 131 555	
Email: info@epa.nsw.gov.au	
Locked Bag 5022	
PARRAMATTA NSW 2124	



Environment Protection Licence

Licence - 684

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Environment Protection Licence

Licence - 684

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Environment Protection Licence

Licence - 684

Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).



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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

PGH BRICKS & PAVERS PTY LIMITED
LOCKED BAG 1345
NORTH RYDE NSW 1670

subject to the conditions which follow.



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1 Administrative Conditions

A1 What the licence authorises and regulates

A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Ceramic works	Ceramics production	0 - 15000 T annual production capacity
Mining for minerals	Mining for minerals	0 - 30000 T annual production capacity

A2 Premises or plant to which this licence applies

A2.1 The licence applies to the following premises:

Premises Details
PGH BRICKS & PAVERS BADGERYS CREEK
235 MARTIN ROAD
BRADFIELD
NSW 2556
LOT 1 DP 1278780, LOT 2 DP 1278780, LOT 3 DP 1278780

A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land



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P1 Location of monitoring/discharge points and areas

- P1.1 The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area.
- P1.2 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
3	Discharge to waters and water quality monitoring	Discharge to waters and water quality monitoring	Outlet from Sediment Basin B as described in 'Water Pollution Impact Assessment for Discharge of Stormwater Runoff from Disturbed Areas at PGH Badgerys Creek (Version 2)', PGH Bricks, 04/02/2021

- P1.3 The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises.

Noise/Weather

EPA identification no.	Type of monitoring point	Location description
4	Noise monitoring	255 LAWSON ROAD, BADGERYS CREEK, 2555
5	Noise monitoring	217 MARTIN ROAD, BADGERYS CREEK, 2555
6	Noise monitoring	50 VICTOR AVENUE, KEMPS CREEK, 2178

3 Limit Conditions

L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

- L2.1 For each monitoring/discharge point or utilisation area specified in the table/s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the



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concentration limits specified for that pollutant in the table.

- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table's.
- L2.4 Water and/or Land Concentration Limits

POINT 3

Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
pH	pH				6.5-8.5
Turbidity	nephelometric turbidity units				50

L3 Waste

- L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.
Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.
Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.
This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Tunnel Spoil	Tunnel spoil that meets the criteria of a specific Resource Recovery Order and Resource Recovery Exemption granted by the NSW EPA.	-	Only for the purpose of quarry rehabilitation
NA	Excavated natural material	As defined in the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment (Waste)	-	Only for the purpose of quarry rehabilitation



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Regulation 2014 – The excavated natural material order 2014

- L3.2 The licensee must not cause, permit, or allow any waste generated outside the licensed premises to be received at the licensed premises except virgin excavated maerial (VENM), or as expressly permitted by a condition of this licence or a resource recovery order and resource recovery exemptionunder the Protection of the Environment Operations (Waste) Regulation 2014.
- L3.3 The licensee must have in place and implement procedures to identify and prevent the acceptance of any waste not permitted by Condition L3.1 to be accepted at the premises.
- L3.4 No asbestos waste is to be accepted at the premises.

L4 Noise limits

- L4.1 Noise from the premises (excluding mobile pant) must not exceed:
 - a) an LA10(15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sundays and Public Holidays; and
 - b) an LA10(15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.
- L4.2 Noise from the operation of mobile plant must not exceed:
 - a) an LA10(15 minute) noise emssion criteron of 50 dB(A)> (0700 to 2200) Monday to Saturday and (0800 to 2200) Sundays and Public Holidays; and
 - b) an LA10(15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.
- L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 metres from the residence, at the most affected point within 30 metres of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.
- L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 4

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Morning-Shoulder	LAeq (15 minute)	-	42
Day	LAeq (15 minute)	-	42
Evening	LAeq (15 minute)	-	41
Night	LAeq (15 minute)	-	38



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Night	LAFmax	-	52
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POINT 5

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Morning-Shoulder	LAeq (15 minute)	-	43
Day	LAeq (15 minute)	-	45
Evening	LAeq (15 minute)	-	40
Night	LAeq (15 minute)	-	38
Night	LAFmax	-	52

POINT 6

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Morning-Shoulder	LAeq (15 minute)	-	43
Day	LAeq (15 minute)	-	43
Evening	LAeq (15 minute)	-	43
Night	LAeq (15 minute)	-	38
Night	LAFmax	-	52

L4.5 For the purposes of the condition above:

- a) Morning shoulder means the period from 5am to 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.
- b) Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.
- c) Evening means the period from 6pm to 10pm.
- d) Night means the period from 10pm to 5am Monday to Saturday and the period from 10 pm to 5am Sunday and public holidays.

L5 Potentially offensive odour

L5.1 No condition in this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997 provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission

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is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.

O3.2 All activities occurring in or on the premises must be carried out in a manner that prevents or minimises the emission of dust.

O3.3 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O3.4 The licensee must ensure that no material, including sediment, is tracked from the premises.

O4 Processes and management

O4.1 The licensee must implement all feasible and reasonable erosion and sediment controls as may be necessary throughout the life of construction works and activities to minimise sediment leaving the premises.

O4.2 The licensee must ensure that all erosion and sediment control measures installed at the premises are inspected and works undertaken to repair and/or maintain these controls as soon as is reasonable and feasible to ensure the proper and efficient operation of these controls. The licensee must record all such inspections including observations and works undertaken to repair and/or maintain erosion and sediment controls and provide these records to an authorised officer upon request.

O4.3 The licensee must ensure that waste identified for recycling is stored separately from other waste.

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O5 Other operating conditions

- O5.1 Water from pits 1, 2 or 3 must not be transferred to Sediment Basin A or Sediment Basin B, or discharged to waterways.

Filling of pits

- O5.2 The filling of the pits must be done in accordance with the Fill Management Plan, version 1.0, Project No. 0606483_S011411, dated 1 August 2023 (or any subsequent version approved in writing by the Department of Planning and NSW EPA).

Importation of VENM/ENM

- O5.3 The licensee must ensure that VENM brought onto the premises meets the definition of VENM as per the EPA's Waste Classification Guidelines (2014).
- O5.4 The licensee must not cause, permit or allow any waste generated outside the licensed premises to be received at the licensed premises except virgin excavated material (VENM), or as expressly permitted by a condition of this licence or a resource recovery order and resource recovery exemption under the Protection of the Environment Operations (Waste) Regulation 2014.
- O5.5 The licensee must ensure that all ENM brought onto the premises meets the definition of ENM as per EPA Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 - The excavated natural material order 2014.
- O5.6 The licensee must ensure there is a dedicated waste quarantine area on the premises for any material found not to be VENM/ENM. This area must be clearly signposted.
- O5.7 All non-conforming waste received at the premises must be disposed of at a facility that can lawfully receive that type of waste as soon as practicable.
- O5.8 The licensee is responsible for ensuring all security provision are taken to prevent illegal dumping of waste at the premises.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this



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- licence:
- a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.

M2 Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 3

Pollutant	Units of measure	Frequency	Sampling Method
Aluminium (dissolved)	milligrams per litre	Monthly during discharge	Grab sample
Electrical conductivity	microsiemens per centimetre	Continuous during discharge	In line instrumentation
pH	pH	Continuous during discharge	In line instrumentation
Turbidity	nephelometric turbidity units	Continuous during discharge	In line instrumentation

M2.3 For the purpose of the above table, if monitoring results for aluminium (dissolved) exceed ANZG (2018) default guideline values (55µg/L for fresh water, pH >6.5), the licensee must notify the EPA within 7 days.

M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Recording of pollution complaints

- M4.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.
- M4.2 The record must include details of the following:
- a) the date and time of the complaint;
 - b) the method by which the complaint was made;

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- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M4.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M4.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M5 Telephone complaints line

- M5.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M5.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M5.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

M6 Other monitoring and recording conditions

Ambient Dust Monitoring

- M6.1 The licensee must operate and maintain a minimum of four ambient dust monitors capable of continuously monitoring and recording particulate emissions (including PM10) from the premises.
- M6.2 The continuous dust monitors must be placed at locations where they are sufficiently capable of monitoring and recording dust coming onto the premises, and dust being generated at the premises.

Weather Monitoring

- M6.3 The licensee must monitor and record temperature, humidity, wind direction, wind velocity and rainfall at either the project weather station, or through analysis of equivalent weather information obtained from the Australian Bureau of Meteorology.

Monitoring must:

- a) be representative of each catchment;
- b) commence prior to any works that may cause sediment or dust to leave the premises; and
- c) continue to be operated until soil disturbance activities cease at the premises and the site has been stabilised.

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6 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee notification that the Annual Return is due.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
- b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

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Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which they became aware of the incident.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

- a) where this licence applies to premises, an event has occurred at the premises; or
- b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

- a) the cause, time and duration of the event;
- b) the type, volume and concentration of every pollutant discharged as a result of the event;
- c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
- d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

7 General Conditions



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G1 Copy of licence kept at the premises or plant

- G1.1 A copy of this licence must be kept at the premises to which the licence applies.
- G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.
- G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Other general conditions

G2.1 Completed Programs

Program	Description	Completed Date
Stormwater management plan	Prepare stormwater management plan for site that includes fuel storage; sewage irrigation.	22-October-2002
Trial Use of Recycled Wastewater	Trial use of recycled wastewater in brick manufacturing. Reduce use of water by using recycled wastewater.	01-December-2008

8 Special Conditions

E1 Dewatering of pit water and discharge to Badgerys Creek

E1.1 Dewatering of pit water and discharge to Badgerys Creek

- 1 The dewatering of pit water and discharge to Badgerys Creek may commence, in accordance with the provisions detailed in the document ‘*Short-term Options Assessment*’, prepared by ERM for CSR Limited, 12 March 2025, Ref 0606483, (EPA Ref DOC25/220655).
- 2 The licensee must notify the EPA in writing that dewatering to Badgerys Creek has commenced.
- 3 One month after commencement of the dewatering, the dewatering process must cease until notified by the EPA that dewatering can re-commence.

E1.2 Update of Discharge Impact Assessment (DIA)

- 1 One month after commencement of discharge to Badgerys Creek, the discharge process must cease and the licensee prepare an updated DIA, including updated discharge limits, based on the first month of discharge results.
- 2 The updated DIA will include the finalisation of the Surface Water Monitoring Plan (SWMP).
This plan should include, but is not limited to:
 - i. Identification of all pollutants to be monitored including total dissolved solids/electrical conductivity (EC), turbidity (NTU) and total suspended soils, pH, dissolved oxygen (DO), nutrients (including ammonia and nitrates), a full suite of metals;
 - ii. Regular monitoring of field analytes (including EC, NTU, DO, pH) and periodic monitoring of a full suite of metals;
 - iii. A wider monitoring suite and higher frequency of monitoring after rainfall; after

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- specific water level triggers, (e.g. 50% 25% 10% etc); and after specific changes in water quality levels;
 - iv. Water quality of the receiving waterway;
 - v. Monitoring of rainfall;
 - vi. Monitoring of discharge frequency and volumes;
 - vii. Location of monitoring points; Frequency and method of monitoring.
- 3 The updated DIA must be submitted to the EPA prior to the commencement of discharge to Badgerys Creek.
- 4 The Licensee must not recommence discharge until approved to do so by the EPA.

E1.3 Trigger Action Response Plan (TARP)

- 1 A TARP must be submitted to the EPA three months after the commencement of the initial discharging into Badgerys Creek.
- 2 The TARP needs to be based on the results of the initial monitoring period, at which point it will be reassessed by the EPA.
- 3 The TARP can be submitted as part of the Water Management Plan (WMP). The TARP should include, but is not limited to:
 - i. Initially be based on results of initial monitoring period but have factored into it increasingly poor water quality towards the end of the dewatering process.
 - ii. Discharge or management criteria for each analyte, where action will be triggered.
 - iii. A sampling regime that is conducted more often than monthly.
4. The TARP can be submitted as part of the Water Management Plan
5. As or when the DIA is updated, TARP must be updated accordingly.

E1.4 Water Management Plan

Three months after commencement of discharge to Badgerys Creek, the licensee must submit the first version of a Water Management Plan (WMP) to the EPA. The WMP must include, but is not limited to:

- i. An ongoing Mitigation Options Report that adequately assesses:
 - a. Additional treatment measures that adequately deal with any exceedances;
 - b. Opportunities for re-use of water over discharge.
- ii. The Surface Water Monitoring Program;
- iii. The completed Trigger Action Response Plan,
- iv. A Site Water Balance Report that includes:
 - a. a representation of the initial dewatering period followed by ongoing maintenance dewatering and reflecting changes to operational settings over the life of the project (e.g. changes to sub-catchment drainage);
 - b. all water inputs to (e.g. direct rainfall, runoff, groundwater inflows, transfers) and outputs from the pits (e.g. evaporation, reuse, transfers, discharges);
 - c. modelling based on a suitable, long-term dataset from a nearby meteorological station
 - d. justification for key model assumptions.

E1.5 Ongoing monitoring and reporting

Following receipt of the WMP, ongoing monitoring and reporting requirements or other licence conditions may be placed on the licence.



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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .



Environment Protection Licence

Licence - 684

TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non-putrescible), special waste or hazardous waste
Wellhead	Has the same meaning as in Schedule 1 to the Protection of the Environment Operations (General) Regulation 2021.

Mr Tim Gilbert

Environment Protection Authority

(By Delegation)

Date of this edition: 01-March-2000



Environment Protection Licence

Licence - 684

End Notes	
1	Licence varied by notice 1009191, issued on 27-Jun-2002, which came into effect on 22-Jul-2002.
2	Licence varied by change to legislation, issued on 05-Jul-2007, which came into effect on 05-Jul-2007.
3	Licence varied by notice 1076261, issued on 19-Sep-2007, which came into effect on 19-Sep-2007.
4	Licence varied by notice 1079904, issued on 28-Nov-2007, which came into effect on 28-Nov-2007.
5	Licence varied by notice 1082805, issued on 06-Mar-2008, which came into effect on 06-Mar-2008.
6	Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
7	Licence varied by notice 1093859, issued on 18-Nov-2008, which came into effect on 18-Nov-2008.
8	Licence varied by change to FBA for summer pollutants, issued on 16-Jan-2009, which came into effect on 16-Jan-2009.
9	Licence varied by notice 1097146, issued on 20-Apr-2009, which came into effect on 20-Apr-2009.
10	Licence varied by notice 1524840 issued on 08-Sep-2014
11	Licence varied by notice 1528953 issued on 19-Mar-2015
12	Licence transferred through application 1530237 approved on 04-May-2015 , which came into effect on 04-May-2015
13	Licence varied by notice 1601711 issued on 23-Mar-2021
14	Licence varied by notice 1630870 issued on 18-Oct-2023
15	Licence varied by notice 1646427 issued on 28-Jan-2025
16	Licence varied by notice 1648430 issued on 15-Apr-2025

Appendix D: Water Licences

Information about a water licence or approval

Use this tool to search for information about water licences and approvals issued under the Water Act 1912 or Water Management Act 2000.

Select the type of licence or approval and enter the licence or approval number:

- Water access licence (WAL): a WAL number starts with the letters 'WAL' followed by several numbers; a WAL also has a reference number that starts with a two digit number, followed by 'AL' and then several numbers.
- 1912 water licence: a water licence number starts with a two digit number, followed by a two letter code and then several numbers. Note: a PT reference number cannot be entered.
- Approval: an approval number starts with a two digit number, followed by a two letter code (WA, UA, CA or FW) and then several numbers.

Search for information about either a:

☒ Water access licence (WAL) issued under the Water Management Act 2000

Water Access Licence (WAL) Number

A WAL number starts with the letters 'WAL' followed by several numbers

Can't find your WAL number? Do you have a reference number? A reference number starts with a two digit number, followed by 'AL' and then several numbers. Use the following tool to find your WAL by entering your reference number. [Enter the reference number to find the WAL number.](#)

Notes:

The search results will list the conditions imposed on the water access licence. Any approved water supply work/s nominated on the water access licence are identified by the approval number/s for the work/s.

The information about a water access licence provided in the search results is a summary and may not always be up to date. If you require full and up to date details about a particular water access licence (including current holders, share and extraction component details, encumbrances and notations) you should search the [Water Access Licence Register](#) administered by Land and Property Information.

☐ Approval issued under the Water Management Act 2000

Find out if a Water Act 1912 licence has been converted

☐ Water licence conversion status

<< Previous Search

Print Export

Search Results

Category [Subcategory]	Status	Water Source	Tenure Type	Management Zone	Share Components (units or ML)
Aquifer	Current	Sydney Basin Central Groundwater Source	Continuing		25.00

Extraction Times or Rates

Subject to conditions water may be taken at any time or rate

Nominated Work Approval(s)

10WA109463

- Conditions

Plan Conditions

Water sharing plan

Greater Metropolitan Region Groundwater Sources

Take of water

MW0929-00001 From 1 July 2018, if the water supply work nominated on this access licence is located at or less than 40 m from the top of the high bank of a river then:
 A. water must not be taken in this groundwater source when flows are in the Very Low Flow Class for an unregulated river access licence in that river.
 B. This restriction will only apply when the system that confirms when water can be taken is available on the relevant licensor website.
 C. the relevant licensor will inform the licence holder in writing of the applicable restrictions and how to access the information on its website when this system becomes operative.

MW0919-00001 A maximum water allocation of 0.1 ML/unit share may be carried over in the account for this access licence from one water year to the next water year if a water meter is installed on each water supply work nominated on this licence and each meter is maintained in working order.

MW0605-00001 Water must be taken in compliance with the conditions of the approval for the nominated work on this access licence through which water is to be taken.

MW0547-00001 The total volume of water taken under this licence in any water year must not exceed a volume equal to:
 A. the sum of water in the account from the available water determination for the current year, plus
 B. the water carried over in the account from the previous water year, plus
 C. the net amount of water assigned to or from the account under a water allocation assignment, plus
 D. any water re-credited by the Minister to the account.

Monitoring and recording

MW2338-00001 The completed logbook must be retained for five (5) years from the last date recorded in the logbook.

MW2336-00001 The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.

MW0606-00001 The volume of water taken in the water year must be recorded in the logbook at the end of each water year. The maximum volume of water permitted to be taken in that water year must also be recorded in the logbook.

MW2337-00001 The following information must be recorded in the logbook for each period of time that water is taken:
 A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and
 B. the access licence number under which the water is taken, and
 C. the approval number under which the water is taken, and
 D. the volume of water taken for domestic consumption and/or stock watering.

MW2339-00001 A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.

	Reporting
MW0051-00002	Once the licence holder becomes aware of a breach of any condition on this access licence, the licence holder must notify the Minister as soon as practicable. The Minister must be notified by: A. email: water.enquiries@dpi.nsw.gov.au , or B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.
	Other Conditions
	NIL

Disclaimer: The NSW Office of Water does not warrant the data is current nor does it warrant that the data or the data capturing processes are free from corruption or error.

Privacy: The information provided is limited to meet the requirements of section 57 of the Privacy and Personal Information Act 1998.

Exporting and printing: Search results show a maximum of 50 rows per page. Search results can only be printed page by page.

More information: Should you require further information or technical assistance, please submit your request to water.enquiries@dpi.nsw.gov.au or contact 1800 353 104.

Approval details

Approval number	10WA109463
Status	CURRENT*
Approval kind	Water Supply Works
Water sharing plan	GREATER METROPOLITAN REGION GROUNDWATER SOURCES 2011
Date of effect	01/Jul/2011
Expiry date	08/Nov/2025
Approval holder(s)	Schedule 1
Water supply works	Schedule 2
Conditions	Schedule 3

Contact for service of documents

Name	PGH Bricks & Pavers Pty Ltd
Address	59-67 Cecil Road CECIL PARK NSW 2178

* Note: An approval has effect for such period as is specified in the approval, or if the period is extended under section 105, that extended period. If an application for extension of an approval is lodged before the approval expires, the term of the expiring approval is extended until either the date of the final decision on the application, or a date fixed by the Minister for the approval, whichever is the later date. An approval which has expired can be the subject of an application to extend it but it needs to be accompanied by a statutory declaration of the reasons for the delay in making the application. If the Minister accepts these reasons the term of the approval is taken to have been extended, and the application may be dealt with, as if the application had been made before the approval expired.

It is an offence under the Water Management Act 2000 to breach a term or condition of the approval or to construct and use works to which the approval does not relate. It is also an offence to use works the subject of an approval if the approval has expired, been surrendered or cancelled.

Schedule 1 - Approval holders

The holders of this approval are:

Approval holder(s)	ACN (if applicable)
PGH Bricks & Pavers Pty Ltd	168 794 821

Important notice - change of landholder or contact

Please advise the Office in the event of any of the following, as soon as practicable:

- If there is a change in the ownership or occupation of the land benefited by this approval (see Schedule 2). Under the Water Management Act 2000, an approval is typically held by the owner or lawful occupier of the benefited land. Consequently, a change in occupation may cause a change in your legal obligations as an approval holder.*
- If there is a change to the contact person. You will be required to lodge a written statement signed by all the holders.*
- If there is a change to the mailing address for the nominated contact person. This should be done by the contact person in writing.

** An updated Statement of Approval will be issued free of charge*

Schedule 2 - Water supply works

Part A: Authorised water supply works

Subject to the conditions of this approval, in relation to each numbered work in the table, the holders of this approval are authorised to construct and use a water supply work of the type shown at the location specified:

Work 1

Specified work	EXCAVATION - GROUNDWATER	
Specified location	1//373863	Whole Lot
	1//1035249	Whole Lot
Management zone (if applicable)		
Water source	SYDNEY BASIN CENTRAL GROUNDWATER SOURCE	
Water sharing plan	GREATER METROPOLITAN REGION GROUNDWATER SOURCES 2011	

Schedule 3 - Conditions

The approval is subject to the following conditions:

Plan conditions

Water sharing plan

Greater Metropolitan Region Groundwater Sources

Take of water

MW0655-00001

Any water supply work authorised by this approval must take water in compliance with the conditions of the access licence under which water is being taken.

Water management works

MW0097-00001

If contaminated water is found above the production aquifer during the construction of the water supply work authorised by this approval, the licensed driller must:

- A. notify the relevant licensor in writing within 48 hours of becoming aware of the contaminated water, and
- B. adhere to the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time.

MW0487-00001

The water supply work authorised by this approval must be constructed within three (3) years from the date this approval is granted.

MW0044-00001

A. When a water supply work authorised by this approval is to be abandoned or replaced, the approval holder must contact the relevant licensor in writing to verify whether the work must be decommissioned.

B. The work is to be decommissioned, unless the approval holder receives notice from the Minister not to do so.

C. When decommissioning the work the approval holder must:

- i. comply with the minimum requirements for decommissioning bores prescribed in the Minimum Construction Requirements for Water Bores in Australia (2012), as amended or replaced from time to time, and
- ii. notify the relevant licensor in writing within sixty (60) days of decommissioning that the work has been decommissioned.

Monitoring and recording

MW0484-00001

Before water is taken through the water supply work authorised by this approval, confirmation must be recorded in the logbook that cease to take conditions do not apply and water may be taken.

The method of confirming that water may be taken, such as visual inspection, internet search, must also be recorded in the logbook.

If water may be taken, the:

A. date, and

B. time of the confirmation, and

C. flow rate or water level at the reference point in the water source

must be recorded in the logbook.

MW2338-00001

The completed logbook must be retained for five (5) years from the last date recorded in the logbook.

MW2336-00001

The purpose or purposes for which water is taken, as well as details of the type of crop, area cropped, and dates of planting and harvesting, must be recorded in the logbook each time water is taken.

MW2337-00001

The following information must be recorded in the logbook for each period of time that water is taken:

A. date, volume of water, start and end time when water was taken as well as the pump capacity per unit of time, and

B. the access licence number under which the water is taken, and

C. the approval number under which the water is taken, and

D. the volume of water taken for domestic consumption and/or stock watering.

MW0482-00001

Where a water meter is installed on a water supply work authorised by this approval, the meter reading must be recorded in the logbook before taking water. This reading must be recorded every time water is to be taken.

MW2339-00001

A logbook must be kept, unless the work is metered and fitted with a data logger. The logbook must be produced for inspection when requested by the relevant licensor.

Reporting

MW0051-00001

Once the approval holder becomes aware of a breach of any condition on this approval, the approval holder must notify the Minister as soon as practicable. The Minister must be notified by:

A. email: water.enquiries@dpi.nsw.gov.au,

or

B. telephone: 1800 353 104. Any notification by telephone must also be confirmed in writing within seven (7) business days of the telephone call.

Other conditions**Water management works**

DK1198-00001

The approval holder must allow the relevant licensor or any person authorised by it, full and free access to the works, either during or after construction, for the purpose of carrying out inspection or test of the works and its fittings and shall carry out any work or alterations deemed necessary by the department for the protection and proper maintenance of the works, or the control of the water extracted and for the protection of the quality and the prevention from pollution or contamination of sub-surface water.

DK1208-00001

The approval holder must not construct or install works used for the purpose of conveying, distributing or storing water from the works authorised by this approval, that obstruct the reasonable passage of floodwaters flowing in, to, or from a river or lake.

Glossary

cease to take - Cease to take conditions means any condition on this approval, or on the access licence under which water is proposed to be taken, that prohibits the taking of water in a particular circumstance.

domestic consumption - Domestic consumption is the use of water for normal household purposes in domestic premises situated on the land.

licensor - WaterNSW or DPI Water, depending on which organisation administers your licences and/or approvals

logbook - A logbook is a document, electronic or hard copy, that records specific required information.

metered water supply work - A metered water supply work is a water supply work fitted with a data logger and a water meter that complies with Australian Standard AS 4747: Meters for non-urban water supply.

stock watering - Stock watering is the use of water for stock animals being raised on the land. It does not include the use of water for the raising of stock animals on an intensive commercial basis (kept in feedlots or buildings for all, or a substantial part, of the period during which the stock animals are being raised).

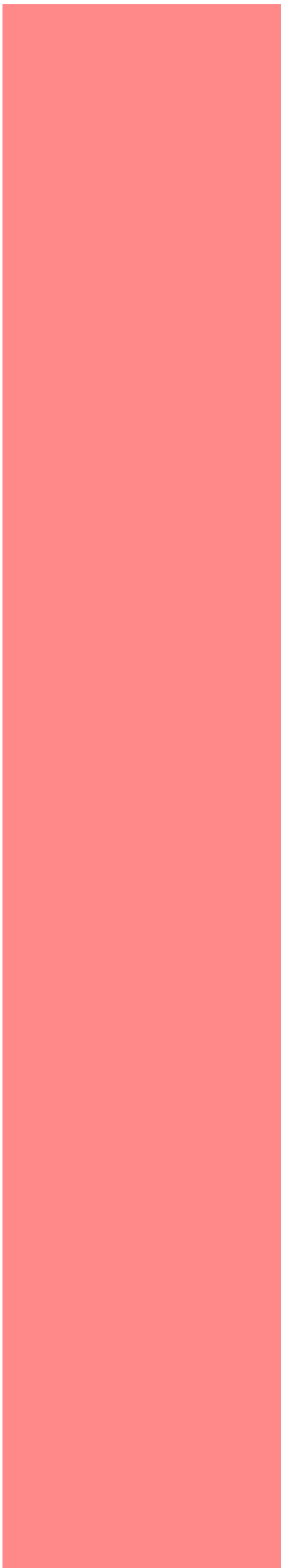
water meter - A water meter is a device that measures the volume of water extracted over a known period of time. Examples of a water meter include a mechanical meter, electromagnetic meter, channel meter with mobile phone, or an authorised meter equivalent.

General Notes

All conditions on an approval require compliance. An appeal to the Land and Environment Court against a decision to impose certain conditions on an approval can be made within 28 days after the date the decision is made. Conditions identified with the first letter "D" are those that can be appealed during the appeal period.

The words in this approval have the same meaning as in the *Water Management Act 2000*

Note: The words in this approval have the same meaning as in the WMA



END OF STATEMENT

Appendix E: Compliance Status

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 2	1	OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT In Addition to meeting the specific performance measures and criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent, and if prevention is not reasonable and feasible, minimise, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Compliant
Project Approval - Mod 6	10_0014	Schedule 2	2	TERMS OF APPROVAL The Applicant , in acting on this consent, must carry out the development: (a) in compliance with the conditions of this consent; (b) in accordance with all written directions of the Secretary; and (c) in accordance with the development layout.	Non-Compliant
Project Approval - Mod 6	10_0014	Schedule 2	3	The Applicant, in acting on this consent, must carry out the development in general accordance with the: (a) EA and Statement of Commitments; (b) EA (Mod 1); (c) EA (Mod 2); (d) EA (Mod 3 and 4); (e) Modification Report (Mod 5); and Modification Report 6.	Compliant
Project Approval - Mod 6	10_0014	Schedule 2	4	The conditions of this consent and directions of the Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document referenced in condition 3 of this Schedule. In the event of an inconsistency, ambiguity or conflict between any of the documents referenced in condition 3 of this Schedule, the most recent document prevails. <i>Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of consent or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 2	5	Consistent with the requirements of this consent, the Secretary may make written directions to the Applicant in relation to: (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Secretary; and (b) the implementation of any actions or measures contained in any such document referred to in (a) above. <i>Note: For the purposes of this condition, there will be an inconsistency between documents if it is not possible to comply with both documents, or in the case of a condition of consent or direction of the Secretary, and a document, if it is not possible to comply with both the condition or direction, and the document.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 2	5A	The development as modified by EA Mod 3 and 4, must be undertaken sequentially in the following stages: (a) Phase 1; (b) Phase 2; (c) Phase 3; and (d) Phase 4. Note: Each of these phases is listed in the definitions and shown in Appendix 3.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																							
Project Approval - Mod 6	10_0014	Schedule 2	5B	The development must notify the Department in writing, at least two weeks before the date of: (a)the commencement of each Phase of the development; (b)the completion of extraction in Pit 3; (c)cessation of Brickmaking Activities; and (d)decommissioning.	Compliant																							
Project Approval - Mod 6	10_0014	Schedule 2	6	COMPLIANCE: The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Compliant																							
Project Approval - Mod 6	10_0014	Schedule 2	7	APPLICABILITY OF GUIDELINES References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, standards or policies in the form they are in as at the date of this consent. However, consistent with the conditions of this consent and without altering any limits or criteria in this approval, the Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, standard or policy, or a replacement of them.	Compliant																							
Project Approval - Mod 6	10_0014	Schedule 2	8	LIMITS OF CONSENT The Applicant may carry out quarrying operations on the site until 27 September 2031 . <i>Note: Under this consent, the Applicant is required to decommission and rehabilitate the site and carry out additional requirements. Consequently, this consent will continue to apply in all respects other than to permit the carrying out of development, until the rehabilitation of the site and those requirements and undertakings have been carried out to the required standard.</i>	Compliant																							
Project Approval - Mod 6	10_0014	Schedule 2	9A	The Applicant may receive, store, and dispatch finished building products at the site until brick making at the site commences.	Compliant																							
Project Approval - Mod 6	10_0014	Schedule 2	10	The Applicant must not exceed the limits in Table 1 during any calendar year <table><tr><th colspan="3">Table 1: Limits on extraction, production, receipt and dispatch volumes per calendar year</th></tr><tr><th>Activity</th><th>Project Phase</th><th>Total Volume (tonnes per calendar year)</th></tr><tr><td>Extraction from Pit 3</td><td>Phase 1 and 2</td><td>420,000</td></tr><tr><td rowspan="2">Receive raw materials for brickmaking</td><td>Phase 1 and 2</td><td>215,000</td></tr><tr><td>Phase 3 onwards</td><td>360,000</td></tr><tr><td>Dispatch raw materials</td><td>Phase 1,2 and 3</td><td>275,000</td></tr><tr><td>Brick production</td><td>All Phases</td><td>300,000</td></tr><tr><td>Dispatch finished building products</td><td>All Phases</td><td>330,000</td></tr></table> <i>Note: The Total Volume limits in Table 1 do not apply to the import of VENM for the purpose of backfilling voids. The import of VENM is separately managed under the restrictions on truck movements contained in Condition 12 of this Schedule.</i>	Table 1: Limits on extraction, production, receipt and dispatch volumes per calendar year			Activity	Project Phase	Total Volume (tonnes per calendar year)	Extraction from Pit 3	Phase 1 and 2	420,000	Receive raw materials for brickmaking	Phase 1 and 2	215,000	Phase 3 onwards	360,000	Dispatch raw materials	Phase 1,2 and 3	275,000	Brick production	All Phases	300,000	Dispatch finished building products	All Phases	330,000	Compliant
Table 1: Limits on extraction, production, receipt and dispatch volumes per calendar year																												
Activity	Project Phase	Total Volume (tonnes per calendar year)																										
Extraction from Pit 3	Phase 1 and 2	420,000																										
Receive raw materials for brickmaking	Phase 1 and 2	215,000																										
	Phase 3 onwards	360,000																										
Dispatch raw materials	Phase 1,2 and 3	275,000																										
Brick production	All Phases	300,000																										
Dispatch finished building products	All Phases	330,000																										
Project Approval - Mod 6	10_0014	Schedule 2	11	The Applicant must not transport bricks or quarry products to or from the site, other than by road.	Compliant																							

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																											
Project Approval - Mod 6	10_0014	Schedule 2	12	The Proponent must not exceed the total truck movements detailed in Table 2. Table 2: Total Truck Movements <table><tr><th>Transport Route Stage</th><th>Project Phases</th><th>Day</th><th>Total truck movements^a</th></tr><tr><td rowspan="3">Prior to the upgrade of the Martin Road-Elizabeth Drive Intersection</td><td rowspan="3">1,2 and 3</td><td>Monday to Friday</td><td>120</td></tr><tr><td>Saturday</td><td>40</td></tr><tr><td>Sundays</td><td>40</td></tr><tr><td rowspan="6">Following completion of the Martin Road-Elizabeth Drive Intersection upgrade</td><td rowspan="3">1,2 and 3</td><td>Monday to Friday</td><td>800</td></tr><tr><td>Saturday</td><td>358</td></tr><tr><td>Sundays</td><td>200</td></tr><tr><td rowspan="3">4</td><td>Monday to Friday</td><td>366</td></tr><tr><td>Saturday</td><td>98</td></tr><tr><td>Sunday</td><td>0</td></tr></table> ^a Note: each truck entering or exiting the site is counted as a separate movement.	Transport Route Stage	Project Phases	Day	Total truck movements ^a	Prior to the upgrade of the Martin Road-Elizabeth Drive Intersection	1,2 and 3	Monday to Friday	120	Saturday	40	Sundays	40	Following completion of the Martin Road-Elizabeth Drive Intersection upgrade	1,2 and 3	Monday to Friday	800	Saturday	358	Sundays	200	4	Monday to Friday	366	Saturday	98	Sunday	0	Compliant
Transport Route Stage	Project Phases	Day	Total truck movements ^a																													
Prior to the upgrade of the Martin Road-Elizabeth Drive Intersection	1,2 and 3	Monday to Friday	120																													
		Saturday	40																													
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Following completion of the Martin Road-Elizabeth Drive Intersection upgrade	1,2 and 3	Monday to Friday	800																													
		Saturday	358																													
		Sundays	200																													
	4	Monday to Friday	366																													
		Saturday	98																													
		Sunday	0																													
Project Approval - Mod 6	10_0014	Schedule 2	12A	Truck movements entering or exiting the site on Sundays are restricted to the importation of Fill for the purpose of backfilling quarry pits and rehabilitation activities. Note: Truck movements are also controlled further by the limits in condition 10 of this Schedule and operating hours in condition 1 of Schedule 3.	Compliant																											
Project Approval - Mod 6	10_0014	Schedule 2	13	STRUCTURAL ADEQUACY All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the project, must be constructed in accordance with the BCA. Notes: • Under Part 6 of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for any proposed building works; • Part 8 of the EP&A Regulation sets out the requirements for the certification of the project	Not Triggered																											
Project Approval - Mod 6	10_0014	Schedule 2	13A	BRICK KILN STACKS The brick kiln stacks must not exceed 41 m above natural ground level.	Not Triggered																											
Project Approval - Mod 6	10_0014	Schedule 2	14	DEMOLITION All demolition work must be carried out in accordance with the Australian Standard AS 2601-2001: The Demolition of Structures (Standards Australia, 2001).	Compliant																											
Project Approval - Mod 6	10_0014	Schedule 2	15	PROTECTION OF PUBLIC INFRASTRUCTURE Unless the Applicant and the applicable authority agree otherwise the Applicant must: (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the project; and (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the project. Note: This condition does not apply to damage to roads caused as a result of general road usage or otherwise addressed by contributions required by condition 25 of Schedule 3.	Compliant																											
Project Approval - Mod 6	10_0014	Schedule 2	16	OPERATION OF PLANT AND EQUIPMENT All plant and equipment used on the site, or to monitor the performance of the project, must be: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Compliant																											

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																													
Project Approval - Mod 6	10_0014	Schedule 2	16A	The external walls of all buildings including additions to existing buildings must comply with the relevant requirements of the BCA. Before the issue of a Construction Certificate and an Occupation Certificate, the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls, including finishes and claddings such as synthetic or aluminium composite panels, comply with the requirements of the BCA. The Applicant must provide a copy of the documentation given to the Certifying Authority to the Secretary within seven days after the Certifying Authority accepts it.	Not Triggered																													
Project Approval - Mod 6	10_0014	Schedule 2	17	PRODUCTION DATA The Applicant must: (a)provide calendar year annual quarry production data to MEG using the standard form for that purpose; and (b)include a copy of this data in the Annual Review.	Compliant																													
Project Approval - Mod 6	10_0014	Schedule 2	18	LIMIT OF EXTRACTION Identification of Approved Extraction Limits Within 3 months of the determination of Modification 3 and 4, the Applicant must: (a)engage a registered surveyor to mark out the boundary of the approved area of extraction within Pit 3; and (b)provide the Secretary with a survey plan of the boundary. The boundary of the approved area of extraction within Pit 3 must be clearly marked in a manner that allows them to be easily identified at all times during the carrying out of quarrying operations.	Compliant																													
Project Approval - Mod 6	10_0014	Schedule 2	19	Maximum Extraction Depth The Applicant must not extract any extractive materials or carry out any work in the extraction area below 35 m below the pre-existing natural surface of the ground, other than construction of bores approved byNSW Water Group or in-pit sumps approved by the Secretary.	Not Triggered																													
Project Approval - Mod 6	10_0014	Schedule 3	1	NOISE hours of Operation 1. The Applicant must comply with the operating hours set out in Table 1. <table><tr><th colspan="2">Table 1: Operating hours</th></tr><tr><th>Activity</th><th>Permissible Hours</th></tr><tr><td rowspan="2">Quarrying operations (excluding truck arrival, loading and dispatch)</td><td>7.00 am to 6.00 pm Monday to Saturday</td></tr><tr><td>At no time on Sundays or public holidays</td></tr><tr><td>Brickmaking Activities</td><td>24 hours per day, 7 days per week</td></tr><tr><td rowspan="2">Truck arrival and dispatch (raw materials only)</td><td>6.00 am to 10.00 pm Monday to Friday</td></tr><tr><td>6.00 am to 6.00 pm Saturday</td></tr><tr><td rowspan="2"></td><td>At no time on Sundays or public holidays</td></tr><tr><td>5.00 am to 10.00 pm Monday to Friday</td></tr><tr><td rowspan="2">Truck arrival and dispatch (finished building products only)</td><td>6.00 am to 6.00 pm Saturday</td></tr><tr><td>At no time on Sundays or public holidays</td></tr><tr><td rowspan="3">Truck arrival and dispatch (Fill import only)</td><td>7.00 am to 6.00 pm Monday to Saturday</td></tr><tr><td>9.00 am to 6.00 pm Sunday</td></tr><tr><td>At no time on public holidays</td></tr><tr><td rowspan="2">Cash sales</td><td>6.00 am to 6.00 pm Monday to Saturday</td></tr><tr><td>At no time on Sundays or public holidays</td></tr><tr><td>Sales selection/Customer Display Centre</td><td>8.00 am to 5.00 pm Monday to Sunday</td></tr><tr><td>Maintenance</td><td>At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations</td></tr></table>	Table 1: Operating hours		Activity	Permissible Hours	Quarrying operations (excluding truck arrival, loading and dispatch)	7.00 am to 6.00 pm Monday to Saturday	At no time on Sundays or public holidays	Brickmaking Activities	24 hours per day, 7 days per week	Truck arrival and dispatch (raw materials only)	6.00 am to 10.00 pm Monday to Friday	6.00 am to 6.00 pm Saturday		At no time on Sundays or public holidays	5.00 am to 10.00 pm Monday to Friday	Truck arrival and dispatch (finished building products only)	6.00 am to 6.00 pm Saturday	At no time on Sundays or public holidays	Truck arrival and dispatch (Fill import only)	7.00 am to 6.00 pm Monday to Saturday	9.00 am to 6.00 pm Sunday	At no time on public holidays	Cash sales	6.00 am to 6.00 pm Monday to Saturday	At no time on Sundays or public holidays	Sales selection/Customer Display Centre	8.00 am to 5.00 pm Monday to Sunday	Maintenance	At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations	Compliant
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Maintenance	At any time, provided that these activities are not audible at any privately-owned residence outside of permissible hours for quarrying operations																																	
Project Approval - Mod 6	10_0014	Schedule 3	1A	With the written agreement of the Secretary, the Applicant may undertake limited campaign trucking (within the limits imposed under conditions 10 and 12 of Schedule 2) for the import of Fill outside of the operating hours prescribed in condition 1 of this Schedule.	Not Triggered																													

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																																			
Project Approval - Mod 6	10_0014	Schedule 3	2	The following activities may be carried out outside the hours specified in condition 1 of this Schedule: (a)activities that are inaudible at residences on privately-owned land; (b)the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons; or (c)emergency work to avoid the loss of life, property or to prevent material harm to the environment. In such circumstances, the Applicant must notify the Department and affected residents prior to undertaking the activities, or as soon as is practical thereafter.	Compliant																																			
Project Approval - Mod 6	10_0014	Schedule 3	3	Construction Noise Approved construction works must only be undertaken during standard construction hours (7 am to 6 pm, Monday to Friday and 8 am to 1 pm on Saturdays), unless the Secretary agrees otherwise.	Compliant																																			
Project Approval - Mod 6	10_0014	Schedule 3	5	Operational Noise Criteria The Applicant must ensure that operational noise generated by the project (including construction activities) does not exceed the criteria in Table 2 at any residence on privately-owned land. <i>Table 2: Operational noise criteria dB(A)</i> <table><tr><th rowspan="2">Receiver ID</th><th>Morning Shoulder</th><th>Day</th><th>Evening</th><th colspan="2">Night</th></tr><tr><th>L_{Asq} (15 min)</th><th>L_{Asq} (15 min)</th><th>L_{Asq} (15 min)</th><th>L_{Asq} (15 min)</th><th>L_{Aeq}</th></tr><tr><td>R9, R25, R35</td><td>43</td><td>45</td><td>40</td><td>38</td><td>52</td></tr><tr><td>R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46</td><td>42</td><td>42</td><td>41</td><td>38</td><td>52</td></tr><tr><td>R11, R12, R13, R14, R15</td><td>43</td><td>43</td><td>43</td><td>38</td><td>52</td></tr><tr><td>All other residences</td><td>-</td><td>40</td><td>35</td><td>35</td><td>52</td></tr></table> Noise generated by the project must be monitored and measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the <i>NSW Noise Policy for Industry (NSW EPA 2017)</i>. However, the noise criteria in Table 2 do not apply if the Proponent has an agreement with the relevant landowner to exceed the noise criteria, and the Proponent has advised the Department in writing of the terms of this agreement. <i>Note: Should an agreement with a landowner be terminated for any reason, the Proponent must comply with the noise criteria in Table 2.</i>	Receiver ID	Morning Shoulder	Day	Evening	Night		L_{Asq} (15 min)	L_{Asq} (15 min)	L_{Asq} (15 min)	L_{Asq} (15 min)	L_{Aeq}	R9, R25, R35	43	45	40	38	52	R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46	42	42	41	38	52	R11, R12, R13, R14, R15	43	43	43	38	52	All other residences	-	40	35	35	52	Compliant
Receiver ID	Morning Shoulder	Day	Evening	Night																																				
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R11, R12, R13, R14, R15	43	43	43	38	52																																			
All other residences	-	40	35	35	52																																			

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																											
Project Approval - Mod 6	10_0014	Schedule 3	6	Road Traffic Noise Criteria The Applicant must ensure that the road traffic noise generated by the project does not exceed the criteria in Table 3 at any privately-owned residence. <i>Table 3: Road traffic noise criteria dB(A)</i> <table><tr><th>Road Noise Receiver ID</th><th>Day / Evening L_{Aeq} (1 hour)</th><th>Night L_{Aeq} (1 hour)</th></tr><tr><td colspan="3">Prior to Martin Road – Elizabeth Road Intersection Upgrade</td></tr><tr><td>Residents on Martin Road</td><td>60</td><td>55</td></tr><tr><td colspan="3">Following Martin Road – Elizabeth Road Intersection Upgrade</td></tr><tr><td>RN5</td><td>61</td><td>55</td></tr><tr><td>RN9, RN21</td><td>62</td><td>55</td></tr><tr><td>RN14, RN22</td><td>63</td><td>55</td></tr><tr><td>RN16</td><td>64</td><td>55</td></tr><tr><td>All other residences on Martin Road</td><td>60</td><td>55</td></tr></table> Traffic noise generated by the development is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy (Department of Environment, Climate Change and Water NSW). However, the noise criteria in Table 3 do not apply if the Applicant has an agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.	Road Noise Receiver ID	Day / Evening L _{Aeq} (1 hour)	Night L _{Aeq} (1 hour)	Prior to Martin Road – Elizabeth Road Intersection Upgrade			Residents on Martin Road	60	55	Following Martin Road – Elizabeth Road Intersection Upgrade			RN5	61	55	RN9, RN21	62	55	RN14, RN22	63	55	RN16	64	55	All other residences on Martin Road	60	55	Compliant
Road Noise Receiver ID	Day / Evening L _{Aeq} (1 hour)	Night L _{Aeq} (1 hour)																														
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RN14, RN22	63	55																														
RN16	64	55																														
All other residences on Martin Road	60	55																														
Project Approval - Mod 6	10_0014	Schedule 3	6A	Upon receiving a written request from the owner of residences RN5, RN9, RN14, RN16, RN21 or RN22, the Applicant must implement noise mitigation treatment packages as described in the EA (Mod 3 and 4) and as set out in the RMS Draft At-Receiver Treatment Packages. If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.	Compliant																											
Project Approval - Mod 6	10_0014	Schedule 3	7	Noise Operating Conditions The Applicant must: (a)take all reasonable steps to minimise the construction, operational, low frequency and road transportation noise of the project; (b)take all reasonable steps to minimise the noise impacts of the project during noise enhancing meteorological conditions; (c)operate a noise management system to guide the day to day planning of quarrying operations and the implementation of noise mitigation measures to ensure compliance with the relevant conditions of this approval; (d)carry out regular noise monitoring to determine whether the project is complying with the relevant conditions of this approval; and (e)modify or stop operations on the site to comply with the relevant conditions of this approval. <i>Note: Monitoring under this approval is not required at all residences and the use of representative monitoring locations can be used to demonstrate compliance with criteria if agreed to by the Secretary.</i>	Compliant																											

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																					
Project Approval - Mod 6	10_0014	Schedule 3	8	Noise Management Plan The Applicant must prepare a Noise Management Plan for the project to the satisfaction of the Secretary. This plan must: (a)be submitted to the Secretary for approval prior to commencing Modification 3 and 4, unless otherwise agreed by the Secretary; (b)describe the measures to be implemented to ensure: •compliance with the noise criteria and operating conditions of this approval; •best practice management is being employed; •residences listed in condition 6A of this Schedule are notified of their rights to request road noise mitigation measures; •vibration impacts are minimised; and •the construction and operational noise impacts of the project are minimised during noise enhancing meteorological conditions; (c)describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to noise are implemented; (d)include a consultation plan detailing: •procedures for notifying and consulting nearby residents prior to the recommencement of quarrying and brick making activities; •procedures for notifying and consulting nearby residents prior to the commencement of construction activities; •details of a telephone Compliants line (operated at all hours) and relevant site persons responsible for following up Compliants; •procedures for handling and monitoring all Compliants received; and •contingency measures that would be implemented where Compliants are received; (e)describe the proposed noise management system; and (f)include a noise monitoring program that: •is capable of evaluating the performance of the project; •includes a protocol for determining any exceedances of the relevant conditions of this approval; and •effectively supports the noise management system. The Applicant must implement the Noise Management Plan as approved by the Secretary.	Compliant																					
Project Approval - Mod 6	10_0014	Schedule 3	9	Air Quality Impact Assessment Criteria The Applicant must ensure that particulate matter emissions generated by the project do not cause exceedances of the criteria in Table 4 at any residence on privately-owned land. <i>Table 4: Air quality criteria</i> <table><tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr><tr><td>Particulate matter < 2.5 µm (PM₁₀)</td><td>Annual</td><td>a,d 8 µg/m³</td></tr><tr><td>Particulate matter < 2.5 µm (PM₁₀)</td><td>24 hour</td><td>b 25 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>Annual</td><td>a,d 25 µg/m³</td></tr><tr><td>Particulate matter < 10 µm (PM₁₀)</td><td>24 hour</td><td>b 50 µg/m³</td></tr><tr><td>Total suspended particulates (TSP)</td><td>Annual</td><td>a,d 90 µg/m³</td></tr><tr><td>^c Deposited dust</td><td>Annual</td><td>b 2 g/m²/month a,d 4 g/m²/month</td></tr></table> <i>Notes to Table 4:</i> ^a Total impact (ie increase in concentrations due to the development plus background concentrations due to all other sources). ^b Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development). ^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method. ^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.	Pollutant	Averaging Period	Criterion	Particulate matter < 2.5 µm (PM ₁₀)	Annual	a,d 8 µg/m ³	Particulate matter < 2.5 µm (PM ₁₀)	24 hour	b 25 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	Annual	a,d 25 µg/m ³	Particulate matter < 10 µm (PM ₁₀)	24 hour	b 50 µg/m ³	Total suspended particulates (TSP)	Annual	a,d 90 µg/m ³	^c Deposited dust	Annual	b 2 g/m ² /month a,d 4 g/m ² /month	Non-Compliant
Pollutant	Averaging Period	Criterion																								
Particulate matter < 2.5 µm (PM ₁₀)	Annual	a,d 8 µg/m ³																								
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Particulate matter < 10 µm (PM ₁₀)	Annual	a,d 25 µg/m ³																								
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^c Deposited dust	Annual	b 2 g/m ² /month a,d 4 g/m ² /month																								

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	10	Operating Conditions The Applicant must: (a)implement best practice management to minimise the dust emissions of the project; (b)implement all air quality management and mitigation measures that were committed to in the EA (Mod 3 and 4); (c)implement real-time monitoring of 24-hour average PM10 and meteorological conditions; (d)regularly assess meteorological and air quality monitoring data and relocate, modify and/or stop operations on site to ensure compliance with the air quality criteria in this approval; (e)minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see note d under Table 4); (f)monitor and report on compliance with the relevant air quality conditions in this approval; and (g)minimise the area of surface disturbance and undertake progressive rehabilitation of the site, to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	10A	During Phase 4, the Applicant may request the Secretary's agreement to reduce or waive certain air quality monitoring requirements if the Applicant can demonstrate that they are no longer necessary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	11	The Applicant must ensure compliance with stack emission limits and gaseous pollutant load limits included in any EPL applicable to the site.	Not Triggered
Project Approval - Mod 6	10_0014	Schedule 3	12	Within 14 months of commencement of increased production of bricks to 300,000 tonnes per year, or as otherwise required by the EPA, the Applicant must submit an Air Quality Verification Assessment to the EPA, and must provide a copy of this assessment to the Secretary. The Air Quality Verification Assessment must be completed in accordance with the requirements of the EPL for the premises.	Not Triggered
Project Approval - Mod 6	10_0014	Schedule 3	13	Air Quality Management Plan The Applicant must prepare an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with relevant WSA authorities; (b) be submitted to the Secretary for approval prior to commencing Phase 1, unless otherwise agreed by the Secretary; (c) describe the proposed air quality management system; (d) describe the measures to be implemented to ensure: •compliance with the air quality criteria and operating conditions of this approval; •best practice management is being employed; and •the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; (e) describe measures to ensure that all the commitments in the EA (Mod 3 and 4) in relation to air quality are implemented; (f) include a program to ensure surface disturbance associated with quarrying operations is minimised; (g) include an air quality monitoring program that: •is capable of evaluating the performance of the project and informing day to day operational decisions; •includes a protocol for determining any exceedances of the relevant conditions of this approval; and •effectively supports the air quality management system; and (h) include a program to: •notify affected landowners of the potential health-related impacts associated with dust; •respond effectively to enquiries or Compliants. The Applicant must implement the Air Quality Management Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	14	Meteorological Monitoring For the life of the project, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the site that complies with the requirements in the Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales guideline and is capable of measuring meteorological conditions in accordance with the NSW Noise Policy for Industry (EPA, 2017).	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	15	Odour The Applicant must ensure that no offensive odours, as defined by the POEO Act, are emitted from the site.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	16	Greenhouse Gas Emissions The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3		SOIL AND WATER <i>Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain all necessary approvals and/or water licences for the project.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	17	The Applicant must ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of operations under the approval to match its available water supply, to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	17A	The Applicant must report on water extracted from the site each year (direct and indirect) in the Annual Review, including water taken under each water licence.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	18	Water Discharges The Applicant must ensure that all quarry water from the site is contained wholly within the site except where otherwise authorised by condition 19 and 19A of this Schedule.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	19	The Applicant must ensure that all surface water discharges from the site comply with the limits (both volume and quality) set in any EPL applicable to the site.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	19A	Dewatering of Pits 1, 2 and 3 All water that is dewatered from Pit 1 (including any water transferred into Pit 1 from Pit 2 and Pit 3) must be transferred from the site in accordance with the Dewatering Management Plan required under Condition 23A of this Schedule.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	19B	All dewatering activities from Pit 1 must be completed within Phase 1 unless otherwise agreed by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	20	Riparian Buffer Distance The Applicant must maintain a minimum setback width of 60 metres (measured from the top of bank) between extraction areas and both Badgerys Creek and Badgerys Creek tributary. <i>Note: This condition does not prohibit overburden emplacement or rehabilitation works in accordance with the Project Layout Plan.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	21	Alluvial Aquifers The Applicant must ensure that the project has no impact on alluvial aquifers associated with South Creek, Badgerys Creek or their tributaries	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	23	Soil and Water Management Plan The Applicant must prepare a Soil and Water Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person/s approved by the Secretary; (b) be prepared in consultation with Council and NSW Water Group ; (c) be submitted to the Secretary for approval prior to commencing Phase 1, unless otherwise agreed by the Secretary; and	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	23	(d) include a: (i) Site Water Balance that includes: • details of: * sources and security of water supply; * water use and management on site; * adequacy of water storage facilities to contain all surface water runoff; * all existing Water Access Licences and potential Water Access Licences, including information on the relevant Water Sharing Plan and Water Sources; * any off-site water transfers, including those described in condition 23A of this Schedule; and * reporting procedures; and • measures to be implemented to minimise clean water use on site:	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	23	(ii)Surface Water Management Plan, that includes: •a program for obtaining detailed baseline data on surface water flows and quality in water bodies that could potentially be affected by the project; •a detailed description of the surface water management system on site including the: *clean water diversion system; *erosion and sediment controls; *dirty water management system; and *water storages, including the area, depth and capacity of any in-pit sumps; •detailed plans, including design objectives and performance criteria, for: •reinstatement of drainage lines on the rehabilitated areas of the site; and •control of any potential water pollution from rehabilitated areas of the site; •performance criteria for the following, including trigger levels for investigating any potentially adverse impacts on: *the water management system; *surface water quality in creeks and other water bodies that could potentially affected by the project (including Badgerys Creek and Badgerys Creek tributary); and *the stream health, vegetation health and channel stability of water bodies that could potentially affected by the project; •a program to monitor and report on: *any surface water discharges; *the effectiveness of the water management system; *the quality of water discharged from the site to the environment; *surface water flows and quality in local watercourses; and *the stream health, riparian vegetation health and channel stability of creeks and other water bodies that could potentially be affected by the project; and •a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the project; and	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	23	(iii)Groundwater Management Plan that includes: •measures to ensure that the maximum extraction depth is not exceeded (see condition 19 of Schedule 2); •a protocol to obtain appropriate water licence(s) to cover the volume of any unforeseen groundwater inflows into the quarry from the quarry face or floor; •groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts; and •a monitoring program to manage potential impacts, if any, on any alluvium and associated surface water source near the proposed extraction area that includes: *monitoring of boreholes within the alluvial sediments adjacent to Badgerys and South Creeks and their tributaries, and in the Bringelly Shale bedrock aquifer; *monitoring of groundwater inflows into the quarry from the quarry face or floor, or into any in-pit sumps; *monitoring the impacts of the project on baseflows to Badgerys and South Creeks and their tributaries; *identification of a methodology for determining exceedances of the assessment criteria; *a plan to respond to any exceedances of the performance criteria; and *a program to regularly report on monitoring.	Compliant
The Applicant must implement the Soil and Water Management Plan as approved by the Secretary					

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	23 A	Dewatering Infrastructure Plan Prior to carrying out any construction activities associated with the dewatering activities on the site, the Applicant must prepare a Dewatering Infrastructure Plan for the project to the satisfaction of the Secretary. This plan must include: (a) detailed designs for: • any pipeline infrastructure used for dewatering activities; and • the method to be used to cross Badgerys Creek; (b) a flooding assessment which: • considers the impacts of any structures (including overland pipelines) to flood flow within the floodplain up to the PMF; and • describes the measures that will be implemented to minimise those impacts; and (c) a description of the measures to be implemented for: • managing construction and operation of minor surface infrastructure; • avoiding significant impacts and minimisation of impacts generally; • controlling any potential water pollution from construction; • minimising and managing erosion and sedimentation; • decommissioning of pipeline infrastructure; and • rehabilitating disturbed areas. The Applicant must implement the Dewatering Infrastructure Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	23 B	Dewatering Management Plan 23B. The Applicant must prepare a Dewatering Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with NSW Water Group and NRAR; (b) be submitted to the Secretary for approval prior to dewatering activities from Pit 1, unless otherwise agreed by the Secretary; and (c) include: • details of: * off-site water transfer or discharge arrangements; and * procedures for monitoring on volumes transferred off-site and reporting on this as part of annual review; • a Fauna Relocation Plan regarding the transfer of aquatic fauna from Pits 1, 2 and 3 prepared by a suitably qualified ecologist which includes details on: * native fauna species known to inhabit and/or use the pits which require transfer from the pits; * methodology proposed to transfer the fauna; * location and suitability of the proposed relocation sites; * any potential impacts of relocating the fauna to the relocation sites and proposed mitigation measures; and * details of ecologists to monitor dewatering activities; • a Geotechnical Monitoring Program, prepared by a suitably qualified and experienced geotechnical engineer, to examine and monitor the faces and high walls of the quarry pits to determine potential geotechnical hazards and evaluate risks of potential failures; • a program to monitor and report on dewatering that involves any discharge from the site, including: * the quality of any water discharged from the site; * surface water flows and quality in local watercourses; and * the stream health, riparian vegetation health and channel stability of creeks and other water bodies that could potentially be affected by the discharges; and • a plan to respond to any exceedances of the performance criteria and mitigate and/or offset any adverse surface water impacts of the discharges.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	23 C	Flooding The Applicant must prepare and implement an Evacuation Plan for the site. This Evacuation Plan must be prepared in consultation with the State Emergency Services and include details of the site evacuation and sheltering procedures during flood events.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	24	TRANSPORT Transport - Road Haulage Prior to commencing Phase 1, the Applicant must: (a) erect signage on Elizabeth Drive advising of “trucks turning”; (b) install a wheel wash on the quarry access road and Fill haul road to prevent material being deposited on Martin Road; and (c) ensure the access driveway from Martin Road is capable of catering for all heavy vehicles associated with the project in accordance with AS2890.2, to the satisfaction of Council.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	25	Road Upgrade and Maintenance Contribution Prior to the recommencement of quarrying operations, the Applicant must enter into a formal agreement with Council for: (a) the repair of historical impacts of trucking from the project on Martin Road; and (b) annual road maintenance contributions to be paid to Council, based on the weight of all laden truck movements to and from the site, for the duration that Martin Road is vested in the Council as the roads authority. The Applicant must provide evidence to the Secretary that the agreement has been executed and implemented to the satisfaction of Council. If there is any dispute between the Proponent and Council, then either of the parties may refer the matter to the Secretary for resolution.	Not Triggered
Project Approval - Mod 6	10_0014	Schedule 3	25 A	Prior to increasing truck movement limits as specified in condition 12 of Schedule 2, the Applicant must complete an interim upgrade of the Martin Road and Elizabeth Drive Intersection. The final design of intersection must be to the satisfaction of the relevant roads authority/s and must: (a) be designed and constructed in accordance with Austroads Guidelines, Australian Standards and any requirements of the relevant road authority/s; (b) include, at a minimum, a three phase signal operation including a right turn green light and pedestrian crossings on one Martin Road and one Elizabeth Drive approach; (c) be subject to a Works Authorisation Deed (WAD) with TfNSW; and (d) be funded by the Applicant, unless otherwise agreed with TfNSW.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	25 B	With the written agreement of the Secretary, the requirements of condition 25A of this Schedule may be waived if the Applicant can demonstrate that the Martin Road-Elizabeth Drive Intersection has been upgraded to achieve service, capacity and safety standards equivalent to or greater than those required under condition 25A of this Schedule.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	25 C	The Applicant must provide an area for a potential transport corridor associated with an extension of Martin Road through the site (as conceptually shown in Appendix 3). The final design and location of the transport corridor and any associated commercial arrangements must be determined in consultation with TfNSW. The Applicant must advise the Secretary in writing of the final design and location of the transport corridor as agreed with TfNSW, and update relevant management plans, strategies or programs for the project to reflect the transport corridor.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	26	Monitoring of Product Transport The Applicant must keep accurate records of: (a) all truck movements to and from the site (including time of arrival and dispatch and nature of material transported); (b) the weight of all bricks, Fill and quarry products transported to and from the site; and (c) publish a summary of these records on its website every 6 months.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	27	Operating Conditions The Applicant must: (a) ensure that all laden trucks carrying quarry products, raw materials or Fill have their loads covered when arriving at or leaving the site; (b) ensure that all trucks are cleaned of material that may fall from vehicles, before leaving the site; (c) use its best endeavours to ensure that appropriate signage is displayed on trucks used to transport finished building materials, quarry products or raw materials to or from the project so they can be easily identified by road users; and (d) continue to engage with TfNSW regarding the detailed planning and design for the Eastern Airport Ring Road.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	28	The Applicant must prepare a Traffic Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with TfNSW, WSA and Council; (b) be submitted to the Secretary for approval prior to commencing Phase 1 operations, unless otherwise agreed by the Secretary; (c) describe the processes in place to control the arrival and dispatch of trucks; (d) include a Drivers' Code of Conduct that details the safe and quiet driving practices that must be used by drivers travelling to and from the site; (e) describe the measures to be put in place to ensure compliance with the Drivers' Code of Conduct; (f) propose measures to minimise the transmission of dust and tracking of material onto the surface of the public road from vehicles leaving the quarry; (g) describe the measures to manage construction and cumulative traffic impacts on the surrounding road network; and (h) be updated as necessary to reflect the operational phases and truck movement limits specified in condition 12 of Schedule 2 and prior to the commencement of any construction works for the upgrade of the Martin Road – Elizabeth Drive Intersection or the Eastern Airport Ring Road. The Applicant must implement the Traffic Management Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	29	ABORIGINAL HERITAGE The Applicant must ensure that: (a) archaeological salvage of site BC-01-09 is undertaken in accordance with Recommendation 1, Section 6.0 of the Aboriginal Heritage Assessment – Addendum in the EA; (b) regeneration works, dewatering activities and water discharges in the area of the archaeological deposit identified adjacent to Badgerys Creek (see Appendix 5) are either avoided, or else undertaken in a manner that will minimise harm to Aboriginal objects, to the satisfaction of the Secretary; and (c) measures are implemented prior to the commencement of Phase 1, to conserve and protect the hearth feature within site BCBW18 AS 02 02 (AHIMS ID 45-5-5164)	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	30	The Applicant must prepare an Aboriginal Heritage Management Plan for the project to the satisfaction of the Secretary. The plan must: (a) be prepared by suitably qualified and experienced persons; (b) be prepared in consultation with Registered Aboriginal Parties and Heritage NSW; (c) be submitted to the Secretary for approval within 6 months of the determination of Modification 3 and 4, unless otherwise agreed by the Secretary; (d) include a description of the measures that would be implemented to: (i) protect, monitor and manage identified Aboriginal objects and Aboriginal places on the site (including any proposed archaeological investigations and salvage measures), including specific measures to ensure that the archaeological deposit adjacent to Badgerys Creek (see Appendix 5) is not impacted during regeneration operations; (ii) conserve the entire extent of the hearth feature within site BCBW18 AS 02 (AHIMS ID 45-5-5164); (iii) manage the discovery of previously unidentified Aboriginal objects or Aboriginal places on the site; and (iv) facilitate ongoing consultation and involvement of Registered Aboriginal Parties in the conservation and management of Aboriginal cultural heritage on the site; and (e) include a protocol to be implemented in the event that skeletal remains are discovered during the project. The Applicant must implement the Aboriginal Heritage Management Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	31	If human remains are discovered on the site, then all work in the area surrounding the discovery must cease, and the area must be secured. The Applicant must immediately notify NSW Police Force and Heritage NSW, and work must not recommence in the area until authorised by NSW Police Force and Heritage NSW.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	32	If any potential Aboriginal object or Aboriginal place is identified on the site, or suspected to be on the site: (a) all work in the immediate vicinity of the object or place must cease immediately; (b) a 10 m buffer area around the object or place must be cordoned off; and (c) Heritage NSW must be contacted immediately.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	33	Work in the immediate vicinity of a site identified in condition 32 of this Schedule may only recommence if: (a) the object or place is confirmed by Heritage NSW upon consultation with the Registered Aboriginal Parties not to be an Aboriginal object or Aboriginal Place; (b) the Aboriginal Cultural Heritage Management Plan is revised to include the object or place and appropriate measures in respect of it; or (c) the Secretary is satisfied with the measures to be implemented in respect of the object or place and makes a written direction in that regard.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	34	Rehabilitation Objectives The Applicant must rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the project under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (Mod 3 and 4) and shown in Appendix 4, and must comply with the objectives in Table 5.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	35	Progressive Rehabilitation The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation. <i>Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to future re-disturbance.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	35 A	The Applicant must complete the backfilling of Pits 1 and 2 within 6 years of commencement of Phase 1, or as otherwise agreed by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	35 B	The Applicant must complete the backfilling of Pit 3 within 2 years of the date of completion of extraction activities in Pit 3, or as otherwise agreed by the Secretary.	Not Triggered

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	36	Rehabilitation Management Plan The Applicant must prepare a Rehabilitation Management Plan for the project, in accordance with the conditions imposed on the mining lease(s) associated with the project under the Mining Act 1992. This plan must: (a) be prepared in consultation with the Department, NSW Water Group, BCS, TfNSW, relevant WSA authorities and Council; (b) build upon the Rehabilitation Objectives in Table 5 and the proposed rehabilitation strategy described in the EA (Mod 3 and 4) and shown in Appendix 4; (c) investigate options for the future use of disturbed areas following the completion of backfilling operations, having regards to the strategic planning associated with the draft Western Sydney Aerotropolis Plan (or subsequently adopted NSW Government strategic plans); (d) describe and justify the proposed rehabilitation strategy for the site, including the landform and use of the site following the completion of quarry operations; (e) include details of the planting of replacement trees in riparian areas consistent with the Statement of Commitments and with vegetation requirements for WSA to minimise wildlife impacts; (f) describe how the rehabilitation of the site would achieve the objectives identified in Table 5 and the requirements of conditions 35A and 35B of this Schedule; (g) include detailed Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan for evaluating the performance of the rehabilitation of the site; (h) include procedures for the use of interim stabilisation and temporary vegetation strategies, where reasonable to minimise the area exposed for dust generation; (i) to the maximum extent practicable, build on and integrate with the other management plans required under this consent; (j) include a life of mine rehabilitation and mining schedule and a protocol for progressive reviews of key progressive rehabilitation milestones from the commencement of operations through to decommissioning and mine closure; (k) include an overview of the identified risks to achieving successful rehabilitation and strategies to be implemented to address these risks; (l) include a program to monitor, audit and report on the progress against the Rehabilitation Objectives and Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan; and (m) describe the measures to be implemented to ensure compliance with the relevant conditions of this approval, including intervention and adaptive management techniques that may be required to ensure rehabilitation remains on a trajectory of achieving the Rehabilitation Objectives, Rehabilitation Completion Criteria and the Final Landform and Rehabilitation Plan as soon as reasonably practical. <i>Note: The Rehabilitation Management Plan may be combined with a Mining Operations Plan, or similar plan, required under the mining lease granted for the development.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	36	VISUAL The Applicant must implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the project to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	37		Compliant
Project Approval - Mod 6	10_0014	Schedule 3	37A	Within 3 months of commencing quarrying operations in Pit 3, the Applicant must construct landscaped earthen bunds and plant vegetation screens (as shown conceptually in Appendix 3), to minimise the visual impacts of the project. The landscaped earthen bunds and plant vegetation screens must be maintained until the Pit 3 area has been fully rehabilitated.	Not Triggered
Project Approval - Mod 6	10_0014	Schedule 3	37 B	Within 6 months of the Secretary being advised of the confirmed Eastern Airport Ring Road alignment, as required under condition 25C of this Schedule, the Applicant must construct landscaped earthen bunds and plant vegetation screens around the brickmaking facility and raw material stockpile (as shown conceptually in Appendix 3), to minimise the visual impacts of the project. The landscaped earthen bunds and plant vegetation screens must be maintained for the life of the project.	Not Triggered
Project Approval - Mod 6	10_0014	Schedule 3	37 C	The Applicant must ensure that all outdoor and external lighting at the site: (a) complies with AS4282 (INT) 1995 – Control of Obtrusive Effects of Outdoor Lighting; and (b) is designed in accordance with any Civil Aviation Safety Authority requirements for the WSA and is mounted, screened and directed in such a manner that it does not cause distraction or confusion to pilots due to light spill above the horizontal plane.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	37 D	Visual Impact Management Plan Within 6 months of approval of Modification 3 and 4, the Applicant must prepare a Visual Impact Management Plan for the project to the satisfaction of the Secretary. This plan must: (a) be prepared by a suitably qualified and experienced person/s; (b) be prepared in consultation with Council, TfNSW and relevant WSA authorities; (c) describe the measures to be implemented to minimise the visual, landscaping and off-site lighting impacts of the project to the WSA and surrounding community; (d) include a landscaping strategy to shield public views of the project (including views from the Eastern Airport Ring Road) that includes: • the measures identified in the EA (Mod 3 and 4); • a vegetation strategy utilising a diversity of local provenance tree species from the native vegetation community (or communities) that occur or once occurred on the site, and would minimise wildlife attraction; • a bund vegetation and maintenance schedule; and • procedures to notify, consult with and implement site-specific mitigation measures at affected privately-owned residences; (e) include a program to monitor and report on the implementation and effectiveness of the mitigation measures; and (f) include a protocol to update the plan to include the requirements of condition 37A and 37B of this Schedule, once the Secretary has been advised of the confirmed Eastern Airport Ring Road alignment, as required under condition 25C of this Schedule. The Applicant must implement the Visual Impact Management Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	37 D	The Applicant must implement the Visual Impact Management Plan as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	38	Waste The Applicant must: (a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council; (b) minimise the waste generated by the project; (c) ensure that the waste generated by the project is appropriately stored, handled, and disposed of; and (d) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary. Note: Approval pursuant to Section 68 of the Local Government Act 1993 is required from Council for onsite sewage management systems.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	39	Except as expressly permitted in an EPL and/or the conditions of this approval, the Applicant must not receive waste on the site for storage, treatment, processing, reprocessing or disposal.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	39 A	Fill Management Plan 39A. Prior to the import of Fill to the site, the Applicant must prepare a Fill Management Plan for the development to the satisfaction of the Secretary. This plan must: (a) identify the quantities of Fill to be imported to site; (b) describe: • the procedures for monitoring Fill imported to the site to ensure that it meets relevant quality specifications for VENM or ENM; • a protocol to prevent materials that fail to meet the requirements of the ENM Exemption and ENM Order from being accepted; • the management of reject materials; • management measures for the emplacement and temporary stockpiling of Fill; • the process for handling Fill for use in rehabilitation; • measures for the on-site use of water captured in sediment basins to ensure that the water does not present a contamination risk; and • processes for assessing, recording, handling and managing any contamination found on the site; and (c) provide an indicative schedule of Fill material to be imported to the site for each Phase of the development, in order to achieve the conceptual final landform. The Applicant must implement the Fill Management Plan as approved by the Secretary.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 3	40	LIQUID STORAGE The Applicant must ensure that all tanks and similar storage facilities (other than for water) are protected by appropriate bunding or other containment, in accordance with the relevant Australian Standards.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	41	DANGEROUS GOODS The Applicant must ensure that the storage, handling, and transport of dangerous goods is done in accordance with the relevant Australian Standards, particularly AS1940 and AS1596, and the Dangerous Goods Code.	Compliant
Project Approval - Mod 6	10_0014	Schedule 3	42	FIRE SAFETY 42.The Applicant must: (a)ensure that the project is suitably equipped to respond to any fires on site; (b)assist the emergency services to the extent practicable if there is a fire in the vicinity of the site; and (c)ensure that the project provides for asset protection in accordance with the relevant requirements in Planning for Bushfire Protection 2019 (NSW RFS 2019).	Compliant
Project Approval - Mod 6	10_0014	Schedule 4	1	NOTIFICATION OF LANDOWNERS As soon as practicable, and no longer than 7 days, after obtaining monitoring results showing: (a) an exceedance of any criteria in Schedule 3, the Applicant must notify the affected landowners in writing of the exceedance, and provide regular monitoring results, at least every 3 months, to each affected landowner until the project is again complying with the relevant criteria; and (b) an exceedance of any air quality criteria in Schedule 3, the Proponent must send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and current tenants of the land (including the tenants of land which is not privately-owned).	Compliant
Project Approval - Mod 6	10_0014	Schedule 4	2	INDEPENDENT REVIEW If a landowner considers the project to be exceeding the relevant criteria in Schedule 3, they may ask the Secretary in writing for an independent review of the impacts of the project on their land. If the Secretary is not satisfied that an independent review is warranted, the Secretary will notify the landowner in writing of that decision, and the reasons for that decision, within 21 days of the request for a review. If the Secretary is satisfied that an independent review is warranted, within 3 months, or as otherwise agreed by the Secretary and the landowner, of the Secretary's decision, the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: • consult with the landowner to determine his/her concerns; • conduct monitoring to determine whether the project is complying with the relevant criteria in Schedule 3; and • if the project is not complying with these criteria, then identify measures that could be implemented to ensure compliance with the relevant criteria; (b) give the Secretary and landowner a copy of the independent review; and (c) comply with any written requests made by the Secretary to implement any findings of the review.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 5	1	ENVIRONMENTAL MANAGEMENT Environmental Management Strategy The Applicant must prepare an Environmental Management Strategy for the project to the satisfaction of the Secretary. This strategy must: (a) be submitted to the Secretary for approval within 6 months of the determination of Modification 3 and 4, unless otherwise agreed by the Secretary; (b) provide the strategic framework for environmental management of the project; (c) identify the statutory approvals that apply to the project; (d) set out the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the project; (e) set out the procedures to be implemented to: • keep the local community and relevant agencies informed about the operation and environmental performance of the project; • receive, record, handle and respond to Compliants; • resolve any disputes that may arise during the course of the project; • respond to any non-compliance and any incident; and • respond to emergencies; and (f) include: • references to any strategies, plans and programs approved under the conditions of this approval; and • a clear plan depicting all the monitoring to be carried out under the conditions of this approval. The Applicant must implement any Environmental Management Strategy as approved by the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	2	Evidence of Consultation Where the conditions of this approval require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document to the Secretary for approval; and (b) provide details of the consultation undertaken, including: • the outcome of that consultation, matters resolved and unresolved; and • details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed any unresolved matters. However, if the Secretary agrees, a strategy, plan or program may be prepared without consultation being undertaken with an identified party required under a condition of this approval	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 5	3	Management Plan Requirements The Applicant must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include: (a) a summary of relevant background or baseline data; (b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; (c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the project; and • effectiveness of any management measures (see (c) above); (e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible; (f) a program to investigate and implement ways to improve the environmental performance of the project over time; (g) a protocol for managing and reporting any: • incidents; • Compliers; and • non-compliers with statutory requirements; (h) a protocol for periodic review of the plan; and (i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of the person/s who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval. Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	4	Application of Existing Strategies, Plans and Programs The Applicant must continue to apply existing management plans, strategies or monitoring programs approved prior to the approval of Modification 3 and 4, until the approval of a similar plan, strategy or program following the approval of Modification 3 and 4.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	5	Revision of Strategies, Plans & Programs Within 3 months of: (a) the submission of an incident report under condition 10 below; (b) the submission of an Annual Review under condition 12 below; (c) the submission of an Independent Environmental Audit report under condition 14 below; and (d) the approval any modifications to this approval, the Applicant must review the suitability of all strategies, plans and programs required under this approval, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary. Notes: • The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the project. • In the event of an inconsistency between condition 5(d) above and any condition in Schedule 3 of this approval, the latter prevails.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 5	6	Updating and Staging of Strategies, Plans or Programs With the approval of the Secretary, the Applicant may: (a) prepare and submit any strategy, plan or program required by this approval on a staged basis (if a clear description is provided as to the specific stage and scope of the project to which the strategy, plan or program applies, the relationship of the stage to any future stages and the trigger for updating the strategy, plan or program); (b) combine any strategy, plan or program required by this approval (if a clear relationship is demonstrated between the strategies, plans or programs that are proposed to be combined); and (c) update any strategy, plan or program required by this approval (to ensure the strategies, plans and programs required under this approval are updated on a regular basis and incorporate additional measures or amendments to improve the environmental performance of the project)	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	7	Adaptive Management The Applicant must assess and manage project-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this approval and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation. Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must as soon as becoming aware of any exceedance: (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not reoccur; (b) consider all reasonable and feasible options for remediation (where relevant); (c) within 14 days of the exceedance occurring, submit a report to the Secretary describing these remediation options and any preferred remediation measures or other course of action; and (d) implement remediation measures as directed by the Secretary; to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	8	Community Consultative Committee The Applicant must establish and operate a Community Consultative Committee (CCC) for the project to the satisfaction of the Secretary. The CCC must be established prior to recommencing quarrying operations and be operated in general accordance with the Department's Community Consultative Committee Guidelines, November 2016 (or later version). <i>Notes:</i> • The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval. • In accordance with the guidelines, the Committee should comprise an independent chair and appropriate representation from the Proponent, Council and the local community. • The Applicant may, with the approval of the Secretary, combine the function of this CCC with the functions of other CCCs in the area.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	9	REPORTING AND AUDITING Incident Notification The Applicant must immediately notify the Department and any other relevant agencies immediately after it becomes aware of an incident. The notification must be made in writing through the Department's Major Projects Website and identify the project (including the development application number and name) and set out the location and nature of the incident.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	10	Non-Compliance Notification Within seven days of becoming aware of a non-compliance, the Applicant must notify the Department of the non-compliance. The notification must be made in writing through the Department's Major Projects website and identify the project (including the development application number and name), set out the condition of this approval that the project is non-compliant with, why it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance. <i>Note: A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.</i>	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 5	11	Regular Reporting The Applicant must provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	12	Annual Review Prior to recommencing quarrying operations or Fill import, and annually thereafter, the Applicant must submit a review to the Department reviewing the environmental performance of the development to the satisfaction of the Secretary. This review must: (a)describe the development (including any progressive 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 Complainants records of the development over the previous calendar year, which includes a comparison of these results against the: •relevant statutory requirements, limits or performance measures/criteria; •requirements of any plan or program required under this consent ; •monitoring results of previous years; and •relevant predictions in the documents listed in condition 3 of Schedule 2; (c)evaluate and report on: •the effectiveness of the air quality and noise management systems; and •compliance with the performance measures, criteria and operating conditions in this consent. (d)identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to rectify the non-compliance and avoid reoccurrence; (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 current calendar year to improve the environmental performance of the development. The Applicant must ensure that copies of the Annual Review are submitted to Council and are available to the Community Consultative Committee (see condition 2 of Schedule 5) and any interested person upon request.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	13	INDEPENDENT ENVIRONMENTAL AUDIT Within 12 months of the commencement of Phase 1, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant must commission, commence and pay the full cost of an Independent Environmental Audit of the project. This audit must: (a) be led and conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary; (b) include consultation with the relevant agencies and the CCC; (c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant EPL or necessary water licences for the project (including any assessment, strategy, plan or program required under these approvals); (d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; (e) recommend appropriate measures or actions to improve the environmental performance of the project, and/or any assessment, strategy, plan or program required under the abovementioned approvals; and (f) be conducted and reported to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	14	Within 12 weeks of commencing this audit, or as otherwise agreed by the Secretary, the Applicant must submit a copy of the audit report to the Secretary and any other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of these recommendations as required. The Applicant must implement these recommendations, to the satisfaction of the Secretary.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	Schedule 5	14A	Any condition of this approval that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification, compliance report and independent audit. <i>Note: For the purposes of this condition, as set out in the EP&A Act, "monitoring" is monitoring of the development to provide data on compliance with the approval or on the environmental impact of the project, and an "environmental audit" is a periodic or particular documented evaluation of the project to provide information on compliance with the approval or the environmental management or impact of the project.</i>	Compliant
Project Approval - Mod 6	10_0014	Schedule 5	15	ACCESS TO INFORMATION Within 3 months of the determination of Modification 3 and 4, until the completion of all works, including rehabilitation and remediation the Applicant must: (a) make the following information publicly available on its website: •the documents listed in condition 3 of Schedule 2; •current statutory approvals for the project; •all approved strategies, plans and programs required under the conditions of this approval; •regular reporting on the environmental performance of the project in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval; •a comprehensive summary of the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs; •summary of the current stage and progress of the project; •contact details to enquire about the project or to make a Complaint; •a complaints register, updated at least monthly; •the Annual Reviews of the project; •any Independent Environmental Audit as described in condition 13 above, and the Proponent's response to the recommendations in any audit; and •any other matter required by the Secretary; and (b) keep this information up to date, to the satisfaction of the Secretary.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	1	The Applicant shall implement all practicable measures to prevent or minimise harm to the environment that may result from the construction, operation or rehabilitation of the project.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	2	CSR will apply to amend EPL 684 to reflect the project.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	3	The environmental management strategy and sub plans will be amended to reflect the project.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	4	Air Quality The Applicant will prepare an Air Quality and Green House Gas Management Plan (AQGHGMP) for the project to the satisfaction of the Director-General. The AQGHGMP will outline the purpose, methodology and expected outcomes of the dust monitoring, and will include the following content: * Dust fraction to be measured, i.e. TSP, PM10 , PM2.5 etc.; * Equipment to be used to measure selected dust fraction; * Frequency of the monitoring, i.e. sample collection schedule; * Duration of the monitoring program; * Location of the monitoring station/s; * Standards/guidelines that are to be followed for location/construction of the monitoring station, equipment calibration, collection of samples and analysis of samples; * Calibration methodology and schedule; * Reporting procedure; * Regulatory guidelines and compliance criteria; * Action levels and contingency measures in the event that pollutant concentrations approach or are likely to exceed the relevant compliance criteria; and * A consultation program that involves nearby agricultural producers and residents, in order to determine if the dust mitigation measures are being effective	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	5	The AQGHGMP will detail measures to control dust and emissions from the Project Site including the following measures: * Haul roads should be watered using water carts such that the road surface has sufficient moisture to minimise visible on-road dust generation but not so much as to cause pooling and mud/dirt track out to occur * Unloading of trucks containing raw or unusable extracted material to be controlled using water sprays/dust suppression when generating excessive visible dust. * Dust from existing stockpiles of unusable material and open pits to be controlled using water sprays with chemical additives (surfactants); * Completed pits to be revegetated as soon as practicable after completion of quarrying activities. * Disturbed soil surfaces to be revegetated in accordance with the RMP for the Project Site. * Operational practices to be reviewed to ensure 'best practice' techniques are being employed and that operational equipment is working efficiently.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	6	The existing HVAS will be moved to as close to the northern boundary of the property and the closest sensitive receiver as possible.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	7	The existing deposited dust gauges will be relocated to appropriate positions as close to the property boundaries and nearest sensitive receivers as possible.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	8	If HVAS and deposited dust air quality monitoring identifies ongoing exceedances of the relevant air quality criteria then the reactive dust management program may need to be reinstated at the site.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	16	The Applicant will operate the sales selection/customer display centre only between the following hours: *8.00 am to 5.00 pm Monday to Sunday.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	17	17.Construction works shall be limited to 7am to 6pm Monday to Friday and 8am to 1pm on Saturdays.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	18	18.A CNVMP will be prepared and implemented during project construction. 18.The construction noise mitigation measures described in Chapter 5.5 of the preferred project noise impact assessment report (appended to the RTS) shall be implemented.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	19	19.Vibration during construction will be managed through the CNVMP to ensure that vibration impacts comply with the limits prescribed in British Standard BS 7385 for structural damage and in Assessing Vibration: a technical guide (DECCW, 2006) for human response.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	20	20.The Applicant and/or its appointed contractors will select and maintain bulk earthwork machinery as specified in the preferred project noise impact assessment report (appended to the RTS).	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	21	21.Broadband reversing alarms or other non-tonal vehicle movement and warning alarms shall be fitted to all machinery on site. The potential noise impact associated with reversing alarms shall be managed and minimised via a combination of proactive driver/operator training and operational procedures.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	22	22.The Applicant shall implement a noise monitoring programme which would involve quarterly attended noise monitoring at a number of nearby identified receiver locations for 12 months after all Modification 3 and 4 activities are in full operation. If there are no exceedances of the project noise trigger levels during quarterly noise monitoring during the first year of monitoring then noise monitoring will cease. Additional noise monitoring would be undertaken in response to any noise Compliant	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	23	23.The Applicant shall undertake consultation with identified Martin Road residential receivers predicted to exceed the RNP criteria and conduct further investigation of their residences (as detailed in Section 2.3.3 and 4.1 of the RTS) to determine whether they qualify for and require the 'Type 1' treatment package from RMS's (2015) At-receiver Treatment Guideline. 23.Further investigations of the six residences potentially affected by road noise will be undertaken prior to increasing heavy vehicle movements along Martin Road above the approved heavy vehicle numbers and no greater than 180 truck movements in the daytime period. The investigation will determine whether the residences require the 'Type 1' treatment package from RMS's (2015) At-receiver Treatment Guideline.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	24	24.Prior to construction of the Martin Road-Elizabeth Drive intersection, existing road noise levels would be qualified to determine if architectural treatment should be offered to receivers along Elizabeth Drive raising complaints about increased road noise levels. 24.The Applicant will maintain a noise Compliant register.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	25	Surface Water Stormwater management 25.The Applicant shall manage surface water on the Project Site in accordance with the WMP prepared for the Project Site and revised for the project, including surface water management measures include in the Modification 3 and 4 EA and the RTS.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	26	26.If during the operational phase of the quarry or on completion of the quarry operations, the Applicant wishes to make use of the water from the pits/dams in the brick making process or for reuse at other premises offsite etc, a licence will be obtained from DPIE.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	27	27.Sediment basins 4, 5 and 6 and the new basins at the raw material stockpile area and Pit 3 will be sized and operated in accordance with Landcom's (2004) Managing Urban Stormwater: Soils & Construction. If any of these basins are to be modified to perform additional stormwater treatment functions in future (other than sediment capture), then appropriate modelling and design of the basins will be required at that time. In this case monitoring of discharges from the basin at Pit 3 to South Creek will be required.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	28	28.The site WMP will be revised prior to commencement of the modification to include the revised surface water management approach, and monitoring of any water discharged from the site.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	29	Monitoring 29.Electrical conductivity, pH, total nitrogen, total suspended solids, turbidity, total alkalinity, arsenic and copper will be monitored at the discharge points to Badgerys Creek and South Creek. Discharges will be monitored daily during the first month of continuous discharge, then weekly if the first month of data does not exceed concentration limits. Monitoring will revert to daily if any limits are exceeded and/or concentrations are reduced below limits.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	30	30. Total dissolved solids, total phosphorus, arsenic, cadmium, chromium, lead, nickel, zinc and mercury will be sampled weekly during the first two months, which will reduce to monthly if there are no exceedances.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	31	31. The analytes previously sampled in Pit 1 will be monitored at three depth levels from the surface to 6 m at two locations near the discharge point to Badgerys Creek. Water will be monitored weekly for three weeks prior to discharge, then monthly. This monitoring will continue for the life of the project, and in the perched treatment basin described above.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	32	32. Similar sampling is also required for the new basin at Pit 3 if the basin is being used to treat Pit 3 water (other than sediment capture). The list of analytes may be able to be reduced according to the future quality of stormwater collected in Pit 3.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	33	Licensing and approvals 33.CSR will apply to the EPA to amend the EPL to incorporate the discharge rates and concentration limits for relevant physical and chemical stressors, and toxicants, at the discharge point to Badgerys Creek.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	34	34.CSR will apply to the EPA to amend the EPL, if and when required, to incorporate appropriate discharge rates and concentration limits for discharges from the basin at Pit 3, for which time the basin provides additional water treatment other than sediment capture.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	35	35.CSR will consult DPIE Water on the need for water licenses associated with the modification.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	36	36.The EPA will be engaged, post approval, to determine whether the pit water must be classified in terms of the Protection of the Environment Operations Act 1997 (POEO Act) and to include the discharge point in the EPL.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	37	Erosion and sediment control 37.Erosion and sediment controls will be implemented at the pit areas once they are filled with Fill and rehabilitation has commenced. These measures will remain in place until surfaces are fully stabilised.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	38	38.Erosion and sediment controls will be implemented along the unsealed Fill haul road, which will direct runoff to the pits or local sediment traps.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	39	Groundwater 39.The Applicant shall prepare and implement a Groundwater Monitoring Program for the Project Site generally in accordance with the methodology provided in Chapter 11 of the 2011 EA, subject to consultation with the DPIE (water, lands and primary industry) and the satisfaction of the Director-General of the DP&I.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	40	40.The WMP will be updated to include the groundwater monitoring network and a TARP for exceedances of groundwater criteria, which will be developed based on the baseline groundwater data.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	41	41.The Applicant shall report the results of the Groundwater Monitoring Program to the Secretary of the DPIE on an annual basis.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	42	42.The Applicant shall implement appropriate management measures in relation to groundwater as indicated by the Monitoring Program and agreed with the Secretary.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	43	43.A licence to authorise any groundwater monitoring installation, required as part of this project, shall be obtained from the DPIE Water prior to any drilling commencing.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	44	44.The Applicant shall implement an alluvial aquifer mapping and assessment program to inform: * The definition of the boundaries of the alluvial system. * Adjustment to the extent of proposed pits to avoid impacts to the alluvial aquifer. * The establishment of further mitigation measures (if required) to minimise potential impacts upon the alluvial aquifer. * This program will commence within 12 months of recommencing quarrying operations and the results will be reported to the Secretary of the DPIE.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	45	Rehabilitation 45.The site will be progressively rehabilitated in accordance with the approved rehabilitation strategy and rehabilitation management plan.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	46	46.The rehabilitation strategy and rehabilitation management plan will be revised to incorporate the project, and any additional management strategies to ensure temporary stabilisation of exposed surfaces, permanent stabilisation strategies and progressive rehabilitation with groundcover vegetation.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	47	47.The rehabilitation management plan will be revised to exclude plant species that are known to attract wildlife and grow to a size which will penetrate the OLS.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	48	48.The Applicant shall carry out rehabilitation works at the Project Site in accordance with the RMP prepared for the Project Site.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	49	49.The Applicant will prepare a Final Landform Rehabilitation Plan in consultation with the DPIE two years prior to the completion of all approved quarrying activities.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	50	Traffic and Transport 50. The Applicant shall manage traffic movements to and from the Project Site generally in accordance with the following: * Personnel operating trucks and vehicles to and from the Project Site would be required to undertake a site-specific health and safety induction, specifying operating hours and vehicle speed limits on Martin Road. * A heavy vehicle protocol would be developed for the Project Site and distributed to relevant staff and contractors during induction procedures. The protocol would deal with such issues as timing of vehicle movements, idling of vehicles, speed limits and parking. * Unnecessary vehicle movements would be minimised where possible. * Deliveries would be scheduled on larger capacity 'Truck and Trailer' vehicles rather than 'Truck Only' vehicles where possible to minimise truck movements. * A construction traffic management plan will be prepared and implemented to manage impacts on the road network, including the intersection, from construction vehicles. * Traffic signals and road upgrades will be constructed at the Martin Road-Elizabeth Drive intersection prior to increasing heavy vehicle movements from the project above the approved heavy vehicle numbers. * CSR will contribute to the upgrade and ongoing maintenance of Martin Road in accordance with the deed of agreement with LCC.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	51	Cultural Heritage 51. The Applicant shall adopt the following measures in relation to the management of cultural heritage on the Project Site: * The heat retainer hearth will continue to be protected by a fenced 10m exclusion zone. * All Aboriginal heritage items collected during survey and test excavations will be reburied with the hearth in consultation with the RAPs. * Should Aboriginal objects be uncovered during the course of the approved works, works shall cease. In cases where historical items have been uncovered, Heritage NSW is to be advised or should indigenous items be uncovered the National Parks and Wildlife Service shall be advised. * Workers/contractors shall be informed of their obligations under the NPW Act 1974, namely that it is illegal to disturb, damage or destroy an Aboriginal object without the prior approval of the Secretary of DPC. * Should human remains be found in, on, or under the land during construction, the responsible party shall: -Contact the local police. -Not disturb or excavate the remains. -Immediately cease all work at the particular location. -Notify the Heritage NSW (DPC) office as soon as practicable and provide any available details of the remains and their location. -Not recommence any work at the particular location until authorised in writing by the Heritage NSW.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	52	52. The AHMP will be updated with the findings of the Modification 4 ACHA.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	53	Ecology 53. The Applicant shall adopt the following measures in relation to the removal of any trees on the Project Site: * The canopy of the trees to be visually inspected prior to clearing to assess for the presence of fauna. Where bird species are detected the tree is to be nudged prior to felling to encourage the fauna to vacate the tree prior to felling. Trees to be left in situ until the birds leave the canopy. * Felled trees are to be left in-situ for at least 24 hours to allow fauna species to relocate. Qualified personnel are to be on hand to check for wildlife and relocate them. * Felled wood is to be relocated to the remnant woodland (and not placed in piles) or chipped and used in rehabilitation areas. * Should any wildlife be inadvertently injured during the proposed works, WIRES or an accredited veterinarian shall be contacted. * A 60 m buffer area shall be provided along Badgerys Creek and the Badgerys Creek tributary, except where Pit 2 extends into these buffers. Rehabilitation works are to be undertaken in this area in accordance with the RMP. * Five local native trees shall be planted for each mature native tree that is removed. The replacement trees shall consist of a diversity of local provenance tree species from the native vegetation community (or communities) that occur, or once occurred on the site. The plantings shall be located adjacent to the riparian vegetation along South Creek, Badgerys Creek and its tributary.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	54	Aquatic biodiversity 54.A 40 m vegetated riparian zone will be maintained around the wetland adjacent to South Creek and 20 m zone will be maintained around the tributary to Badgerys Creek (except over Pit 2).	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	55	55.As the hydraulic modelling for the surface water assessment was indicative, geomorphology will be assessed in greater detail to validate the bed and bank materials of Badgerys Creek prior to finalisation of the pit dewatering strategy. This will include quantification of bed and bank material and particle size and calculation of critical shear stress for the bed and bank to determine its sensitivity to erosion.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	56	56.If the bed and bank materials are demonstrated to be sensitive to erosion, the optimum flow rate that can be achieved without impacting the creek bed and banks will be determined in a sediment transport model.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	57	57.It will be necessary to gain further water quality and flow data to determine the impact of discharges on Badgerys Creek. Water quality will be monitored every month at the four Badgerys Creek and South Creek monitoring locations as described in Section 6.3.2 of the EA. This will include nitrogen speciation to determine which portion of nitrogen is bioavailable and could impact aquatic ecosystems.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	58	58.A biological monitoring program will be developed to detect if the macroinvertebrate community is changed by exposure to discharge water. An in-stream vegetation monitoring program will be prepared and implemented to detect if the discharge is impacting vegetation community composition and mortality.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	59	59.Monitoring for changes to instream vegetation and macroinvertebrates will be incorporated into a pit dewatering plan as a sub-plan to the existing water management plan.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	60	60.CSR will compile a fauna relocation plan. This plan will develop strategies for aspects such as transferring aquatic fauna, acclimatising aquatic fauna to different water conditions and managing pest species. DPIE will be consulted during the development of this strategy..	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	61	Contamination 61.The potential presence of asbestos in the eastern edge of Pit 1 will be added to the site Asbestos Register.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	62	62.A materials management plan will be prepared to ensure that surface water, backfilled material and imported soils are handled appropriately, do not pose a risk to human health or the environment and will be suitable for the proposed land use. The plan will provide procedures to appropriately quantify, classify, dispose of and report on potential contaminants.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	63	63.A UFP will be prepared, providing guidance in the event that future below ground excavations identify contaminated materials (e.g. asbestos, staining, odours). The UFP will outline procedures for handling, assessing and managing any contamination that may be identified as part of Modification 4 works. If previously unidentified contaminated materials are encountered during construction and operation of the proposed modification, relevant statutory requirements, including potential soil testing and waste classification, will need to be complied with, and the material managed and disposed of appropriately.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	64	64.Stored/stockpiled materials within the proposed disturbance footprints will be inspected and they will be recycled or disposed at facilities which can legally receive such materials.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	65	65.Soil materials within the vicinity of the Modification 3 works will be assessed in accordance with NSW EPA (2014) Waste Classification Guidelines and either re- use them on site where suitable or dispose of them offsite to a landfill which can legally receive such materials.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	66	66.Conduct a hazardous material survey on existing site structures prior to demolition/alteration activities.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	67	Waste 67.The Applicant shall manage waste in relation to the project in accordance with the existing WMP for the Project Site.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	68	68.The existing WMP will be updated to include the importation and handling of Fill.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	69	69.All waste generated on site will be managed in accordance with the site's waste management plan that will follow the waste hierarchy of avoid, reduce, re-use, recycle and will be updated to include project works.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	70	Visual amenity 70. . Proposed lighting at the site will still comply with Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	71	Mineral Resources 71. The Applicant will provide annual production data to the water, lands and primary industries division of the Department of Planning, Industry and Environment, as and when requested.	Compliant
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	72	Environmental Management 72. The Applicant shall prepare an EMS for the Project Site to provide environmental management practices and procedures to be followed during the operation of the project. The EMS shall include, but not necessarily be limited to: * identification of statutory and other obligations that the Proponent is required to fulfil in relation to operation of the project; * a description of the roles and responsibilities for all key personnel involved in environmental management of the project; * the environmental policies and principles to be applied to the operation of the project; and * describe in general terms how the environmental performance of the project would be monitored and managed.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance									
Project Approval - Mod 6	10_0014	STATEMENT OF COMMITMENTS	9,10,11,12,13,14,15	Noise 9.The Applicant will implement all practicable measures to undertake the development in a way that minimises the noise generated. The Applicant has made the following commitments in relation to operation noise management: 10.The Applicant will conduct quarrying activities at the Project Site only between the following hours: * 7.00 am to 6.00 pm Monday to Saturday. 11. The Applicant will remove overburden only between the following hours: * 7.00 am to 6.00 pm Monday to Saturday. 12.The Applicant will operate the Brick making facility and storage yard at the Project Site 24 hours a day, Monday to Sunday. 13.The Applicant will receive and dispatch finished building products only between the following hours: * 5.00 am to 10.00 pm Monday to Friday. * 6.00 am to 6.00pm Saturday. 14. The Applicant will receive and dispatch raw material only between the following hours: * 6.00 am to 10.00 pm Monday to Friday. * 6.00 am to 6.00pm Saturday. 15. The Applicant will conduct cash sales only between the following hours: * 6.00 am to 6.00 pm Monday to Saturday.	Compliant									
EPL	EPL	684/15.04.2025	A1	This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation. Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition. <table><tr><th>Scheduled Activity</th><th>Fee Based Activity</th><th>Scale</th></tr><tr><td>Ceramic works</td><td>Ceramic production</td><td>0-15,000 T annual production capacity</td></tr><tr><td>Mining for minerals</td><td>Mining for minerals</td><td>0-30,000 T annual production capacity</td></tr></table>	Scheduled Activity	Fee Based Activity	Scale	Ceramic works	Ceramic production	0-15,000 T annual production capacity	Mining for minerals	Mining for minerals	0-30,000 T annual production capacity	Compliant
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EPL	EPL	684/15.04.2025	A2.1	<table><tr><th>Premises Details</th></tr><tr><td>PGH BRICKS & PAVERS BADGERYS CREEK</td></tr><tr><td>235 MARTIN ROAD</td></tr><tr><td>BRADFIELD</td></tr><tr><td>NSW 2556</td></tr><tr><td>LOT 1 DP 1278780, LOT 2 DP 1278780, LOT 3 DP 1278780</td></tr></table>	Premises Details	PGH BRICKS & PAVERS BADGERYS CREEK	235 MARTIN ROAD	BRADFIELD	NSW 2556	LOT 1 DP 1278780, LOT 2 DP 1278780, LOT 3 DP 1278780	Compliant			
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LOT 1 DP 1278780, LOT 2 DP 1278780, LOT 3 DP 1278780														
EPL	EPL	684/15.04.2025	A3	Information supplied to the EPA	Compliant									
EPL	EPL	684/15.04.2025	A3.1	Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence. In this condition the reference to "the licence application" includes a reference to: a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.	Compliant									
EPL	EPL	684/15.04.2025	2	Discharges to Air and Water and Applications to Land	Compliant									
EPL	EPL	684/15.04.2025	P1	Location of monitoring/discharge points and areas	Compliant									
EPL	EPL	684/15.04.2025	P1.1	The following utilisation areas referred to in the table below are identified in this licence for the purposes of the monitoring and/or the setting of limits for any application of solids or liquids to the utilisation area	Compliant									

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																								
EPL	EPL	684/15.04.2025	P1.2	The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point. <table><tr><th colspan="4">Water and land</th></tr><tr><th>EPA Identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr><tr><td>3</td><td>Discharge to waters and water quality monitoring</td><td>Discharge to waters and water quality monitoring</td><td>Outlet from Sediment Basin B as described in 'Water Pollution Impact Assessment for Discharge of Stormwater Runoff from Disturbed Areas at PGH Badgerys Creek (Version 2)', PGH Bricks, 04/02/2021</td></tr></table>	Water and land				EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description	3	Discharge to waters and water quality monitoring	Discharge to waters and water quality monitoring	Outlet from Sediment Basin B as described in 'Water Pollution Impact Assessment for Discharge of Stormwater Runoff from Disturbed Areas at PGH Badgerys Creek (Version 2)', PGH Bricks, 04/02/2021	Compliant												
Water and land																													
EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description																										
3	Discharge to waters and water quality monitoring	Discharge to waters and water quality monitoring	Outlet from Sediment Basin B as described in 'Water Pollution Impact Assessment for Discharge of Stormwater Runoff from Disturbed Areas at PGH Badgerys Creek (Version 2)', PGH Bricks, 04/02/2021																										
EPL	EPL	684/15.04.2025	P1.3	The following points referred to in the table below are identified in this licence for the purposes of weather and/or noise monitoring and/or setting limits for the emission of noise from the premises. <table><tr><th colspan="3">Noise/Weather</th></tr><tr><th>EPA identification no.</th><th>Type of monitoring point</th><th>Location description</th></tr><tr><td>4</td><td>Noise monitoring</td><td>255 LAWSON ROAD, BADGERYS CREEK, 2555</td></tr><tr><td>5</td><td>Noise monitoring</td><td>217 MARTIN ROAD, BADGERYS CREEK, 2555</td></tr><tr><td>6</td><td>Noise monitoring</td><td>50 VICTOR AVENUE, KEMPS CREEK, 2178</td></tr></table>	Noise/Weather			EPA identification no.	Type of monitoring point	Location description	4	Noise monitoring	255 LAWSON ROAD, BADGERYS CREEK, 2555	5	Noise monitoring	217 MARTIN ROAD, BADGERYS CREEK, 2555	6	Noise monitoring	50 VICTOR AVENUE, KEMPS CREEK, 2178	Compliant									
Noise/Weather																													
EPA identification no.	Type of monitoring point	Location description																											
4	Noise monitoring	255 LAWSON ROAD, BADGERYS CREEK, 2555																											
5	Noise monitoring	217 MARTIN ROAD, BADGERYS CREEK, 2555																											
6	Noise monitoring	50 VICTOR AVENUE, KEMPS CREEK, 2178																											
EPL	EPL	684/15.04.2025	3	LIMIT CONDITIONS Pollution of Waters	Compliant																								
EPL	EPL	684/15.04.2025	L1.1	Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.	Compliant																								
EPL	EPL	684/15.04.2025	L2.1	L2 Concentration limits For each monitoring/discharge point or utilisation area specified in the table\s below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table	Compliant																								
EPL	EPL	684/15.04.2025	L2.2	Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges	Compliant																								
EPL	EPL	684/15.04.2025	L2.3	To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\s.	Compliant																								
EPL	EPL	684/15.04.2025	L2.4	Water and/or Land Concentration Limits	Compliant																								
EPL	EPL	684/15.04.2025	Point 3	<table><tr><th colspan="6">POINT 3</th></tr><tr><th>Pollutant</th><th>Units of Measure</th><th>50 Percentile concentration limit</th><th>90 Percentile concentration limit</th><th>3DGM concentration limit</th><th>100 percentile concentration limit</th></tr><tr><td>pH</td><td>pH</td><td></td><td></td><td></td><td>6.5-8.5</td></tr><tr><td>Turbidity</td><td>nephelometric turbidity units</td><td></td><td></td><td></td><td>50</td></tr></table>	POINT 3						Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit	pH	pH				6.5-8.5	Turbidity	nephelometric turbidity units				50	Compliant
POINT 3																													
Pollutant	Units of Measure	50 Percentile concentration limit	90 Percentile concentration limit	3DGM concentration limit	100 percentile concentration limit																								
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Turbidity	nephelometric turbidity units				50																								

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																				
EPL	EPL	684/15.04.2025	L3.1	L3 WASTE The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below. Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below. Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below. This condition does not limit any other conditions in this licence	Compliant																				
EPL	EPL	684/15.04.2025	L3.1	<table><tr><th>Code</th><th>Waste</th><th>Description</th><th>Activity</th><th>Other Limits</th></tr><tr><td>NA</td><td>Tunnel Spoil</td><td>Tunnel spoil that meets the criteria of a specific Resource Recovery Order and Resource Recovery Exemption granted by the NSW EPA.</td><td>-</td><td>Only for the purpose of quarry rehabilitation</td></tr><tr><td>NA</td><td>Excavated natural material</td><td>As defined in the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment (Waste)</td><td>-</td><td>Only for the purpose of quarry rehabilitation</td></tr><tr><td colspan="2"></td><td>Regulation 2014 – The excavated natural material order 2014</td><td colspan="2"></td></tr></table>	Code	Waste	Description	Activity	Other Limits	NA	Tunnel Spoil	Tunnel spoil that meets the criteria of a specific Resource Recovery Order and Resource Recovery Exemption granted by the NSW EPA.	-	Only for the purpose of quarry rehabilitation	NA	Excavated natural material	As defined in the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment (Waste)	-	Only for the purpose of quarry rehabilitation			Regulation 2014 – The excavated natural material order 2014			Compliant
Code	Waste	Description	Activity	Other Limits																					
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		Regulation 2014 – The excavated natural material order 2014																							
EPL	EPL	684/15.04.2025	L3.2	The licensee must not cause, permit, or allow any waste generated outside the licensed premises to be received at the licensed premises except virgin excavated maerial (VENM), or as expressly permitted by a condition of this licence or a resource recovery order and resource recovery exemptionunder the Protection of the Environment Operations (Waste) Regulation 2014.	Compliant																				
EPL	EPL	684/15.04.2025	L.3.3	The licensee must have in place and implement procedures to identify and prevent the acceptance of any waste not permitted by Condition L3.1 to be accepted at the premises.	Compliant																				
EPL	EPL	684/15.04.2025	L.3.4	No asbestos waste is to be accepted at the premises.	Compliant																				
EPL	EPL	684/15.04.2025	L4.1	Noise Limits Noise from the premises (excluding mobile plant) must not exceed: a) An LA10(15 minute) noise emission criterion of 55 dB(A)(0700 to 2200) Monday to Saturday and 0800 to 2200 Sundays and Public Holidays; and b) An LA10(15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.	Compliant																				
EPL	EPL	684/15.04.2025	L4.2	Noise from the operation of the mobile plant must not exceed: a) An LA10(15 minute) noise emission criterion of 50 dB(A)>(0700 to 2200) Monday to Saturday and (0800 to 2200) Sundays and Public Holidays; and b) An LA10[15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.	Compliant																				
EPL	EPL	684/15.04.2025	L4.3	Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 metres from the residence, at the most affected point within 30 metres of the residence to determine compliance with condition L4.1. 5dB(A) must be added if the noise is tonal or impulsive in character.	Compliant																				
EPL	EPL	684/15.04.2025	L4.4	Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.	Compliant																				

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																								
EPL	EPL	684/15.04.2025	Point 4	POINT 4 <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Morning-Shoulder</td><td>LAeq (15 minute)</td><td>-</td><td>42</td></tr><tr><td>Day</td><td>LAeq (15 minute)</td><td>-</td><td>42</td></tr><tr><td>Evening</td><td>LAeq (15 minute)</td><td>-</td><td>41</td></tr><tr><td>Night</td><td>LAeq (15 minute)</td><td>-</td><td>38</td></tr><tr><td>Night</td><td>LAFmax</td><td>-</td><td>52</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Morning-Shoulder	LAeq (15 minute)	-	42	Day	LAeq (15 minute)	-	42	Evening	LAeq (15 minute)	-	41	Night	LAeq (15 minute)	-	38	Night	LAFmax	-	52	Compliant
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																										
Morning-Shoulder	LAeq (15 minute)	-	42																										
Day	LAeq (15 minute)	-	42																										
Evening	LAeq (15 minute)	-	41																										
Night	LAeq (15 minute)	-	38																										
Night	LAFmax	-	52																										
EPL	EPL	684/15.04.2025	Point 5	<table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Morning-Shoulder</td><td>LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Day</td><td>LAeq (15 minute)</td><td>-</td><td>45</td></tr><tr><td>Evening</td><td>LAeq (15 minute)</td><td>-</td><td>40</td></tr><tr><td>Night</td><td>LAeq (15 minute)</td><td>-</td><td>38</td></tr><tr><td>Night</td><td>LAFmax</td><td>-</td><td>52</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Morning-Shoulder	LAeq (15 minute)	-	43	Day	LAeq (15 minute)	-	45	Evening	LAeq (15 minute)	-	40	Night	LAeq (15 minute)	-	38	Night	LAFmax	-	52	Compliant
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																										
Morning-Shoulder	LAeq (15 minute)	-	43																										
Day	LAeq (15 minute)	-	45																										
Evening	LAeq (15 minute)	-	40																										
Night	LAeq (15 minute)	-	38																										
Night	LAFmax	-	52																										
EPL	EPL	684/15.04.2025	Point 6	POINT 6 <table><tr><th>Time period</th><th>Measurement parameter</th><th>Measurement frequency</th><th>Noise level dB(A)</th></tr><tr><td>Morning-Shoulder</td><td>LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Day</td><td>LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Evening</td><td>LAeq (15 minute)</td><td>-</td><td>43</td></tr><tr><td>Night</td><td>LAeq (15 minute)</td><td>-</td><td>38</td></tr><tr><td>Night</td><td>LAFmax</td><td>-</td><td>52</td></tr></table>	Time period	Measurement parameter	Measurement frequency	Noise level dB(A)	Morning-Shoulder	LAeq (15 minute)	-	43	Day	LAeq (15 minute)	-	43	Evening	LAeq (15 minute)	-	43	Night	LAeq (15 minute)	-	38	Night	LAFmax	-	52	Compliant
Time period	Measurement parameter	Measurement frequency	Noise level dB(A)																										
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Day	LAeq (15 minute)	-	43																										
Evening	LAeq (15 minute)	-	43																										
Night	LAeq (15 minute)	-	38																										
Night	LAFmax	-	52																										
EPL	EPL	684/15.04.2025	L4.5	For the purposes of the condition above: a) Morning shoulder means the period from 5am to 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays. b) Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays. c) Evening means the period from 6pm to 10pm. d) Night means the period from 10pm to 5am Monday to Saturday and the period from 10 pm to 5am Sunday and public holidays.																									
EPL	EPL	684/15.04.2025	L5.1	L5 POTENTIALLY OFFENSIVE ODOUR No condition in this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997. Note: Section 129 of the Protection of the Environment Operations Act 1997 provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.	Compliant																								
EPL	EPL	684/15.04.2025	4	OPERATING CONDITIONS	Compliant																								
EPL	EPL	684/15.04.2025	O1.1	O.1 Activities must be carried out in a competent manner Licensed activities must be carried out in a competent manner. This includes: a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.	Compliant																								

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
EPL	EPL	684/15.04.2025	O2.1	O2 Maintenance of plant and equipment All plant and equipment installed at the premises or used in connection with the licensed activity: a) must be maintained in a proper and efficient condition; and b) must be operated in a proper and efficient manner.	Compliant
EPL	EPL	684/15.04.2025	O3.1	O3 Dust The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Compliant
EPL	EPL	684/15.04.2025	O3.2	All activities occurring in or on the premises must be carried out in a manner that prevents or minimises the emission of dust.	Compliant
EPL	EPL	684/15.04.2025	O3.3	Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.	Compliant
EPL	EPL	684/15.04.2025	O3.4	The licensee must ensure that no material, including sediment, is tracked from the premises.	Compliant
EPL	EPL	684/15.04.2025	O4.1	O4 Processes and management The licensee must implement all feasible and reasonable erosion and sediment controls as may be necessary throughout the life of construction works and activities to minimise sediment leaving the premises.	Compliant
EPL	EPL	684/15.04.2025	O4.2	The licensee must ensure that all erosion and sediment control measures installed at the premises are inspected and works undertaken to repair and/or maintain these controls as soon as is reasonable and feasible to ensure the proper and efficient operation of these controls. The licensee must record all such inspections including observations and works undertaken to repair and/or maintain erosion and sediment controls and provide these records to an authorised officer upon request.	Compliant
EPL	EPL	684/15.04.2025	O4.3	The licensee must ensure that waste identified for recycling is stored separately from other waste.	Compliant
EPL	EPL	684/15.04.2025	O5	Other operating conditions	Compliant
EPL	EPL	684/15.04.2025	O5.01	Water from pits 1,2 or 3 must not be transferred to Sediment Basin A or Sediment Basin B, or discharged to waterways.	Compliant
		684/15.04.2025		Filling of pits	Compliant
EPL	EPL	684/15.04.2025	O5.02	The filling of the pits must be done in accordance with the Fill Management Plan, version 1.0, Project No. 0606483_S011411, dated 1 August 2023 (or any subsequent version approved in writing by the Department of Planning and NSW EPA).	Compliant
		684/15.04.2025		Importation of VENM/ENM	Compliant
EPL	EPL	684/15.04.2025	O5.03	The licensee must ensure that VENM brought onto the premises meets the definition of VENM as per the EPA's Waste Classification Guidelines (2014).	Compliant
EPL	EPL	684/15.04.2025	O5.04	The licensee must not cause, permit or allow any waste generated outside the licensed premises to be received at the licensed premises except virgin excavated material (VENM), or as expressly permitted by a condition of this licence or a resource recovery order and resource recovery exemption under the Protection of the Environment Operations (Waste) Regulation 2014.	Compliant
EPL	EPL	684/15.04.2025	O5.05	The licensee must ensure that all ENM brought onto the premises meets the definition of ENM as per EPA Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014 - The excavated natural material order 2014.	Compliant
EPL	EPL	684/15.04.2025	O5.06	The licensee must ensure there is a dedicated waste quarantine area on the premises for any material found not to be VENM/ENM. This area must be clearly signposted.	Compliant
EPL	EPL	684/15.04.2025	O5.07	All non-conforming waste received at the premises must be disposed of at a facility that can lawfully receive that type of waste as soon as practicable.	Compliant
EPL	EPL	684/15.04.2025	O5.08	The licensee is responsible for ensuring all security provision are taken to prevent illegal dumping of waste at the premises.	Compliant
EPL	EPL	684/15.04.2025	5	MONITORING AND RECORDING CONDITIONS	Compliant
EPL	EPL	684/15.04.2025	M1.1	M1 Monitoring records The results of any monitoring required to be conducted by the licence or a load calculation protocol must be recorded and retained as set out in this condition	Compliant
EPL	EPL	684/15.04.2025	M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance																				
EPL	EPL	684/15.04.2025	M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.	Compliant																				
EPL	EPL	684/15.04.2025	M2.1	M2 REQUIREMENT TO MONITOR CONCENTRATION OF POLLUTANTS DISCHARGED For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:	Compliant																				
EPL	EPL	684/15.04.2025	M2.2	Water and/or Land Monitoring Requirements Point 3 <table><tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr><tr><td>Aluminium (dissolved)</td><td>milligrams per litre</td><td>Monthly during discharge</td><td>Grab sample</td></tr><tr><td>Electrical conductivity</td><td>microsiemens per centimetre</td><td>Continuous during discharge</td><td>In line instrumentation</td></tr><tr><td>pH</td><td>pH</td><td>Continuous during discharge</td><td>In line instrumentation</td></tr><tr><td>Turbidity</td><td>nephelometric turbidity units</td><td>Continuous during discharge</td><td>In line instrumentation</td></tr></table>	Pollutant	Units of measure	Frequency	Sampling Method	Aluminium (dissolved)	milligrams per litre	Monthly during discharge	Grab sample	Electrical conductivity	microsiemens per centimetre	Continuous during discharge	In line instrumentation	pH	pH	Continuous during discharge	In line instrumentation	Turbidity	nephelometric turbidity units	Continuous during discharge	In line instrumentation	Compliant
Pollutant	Units of measure	Frequency	Sampling Method																						
Aluminium (dissolved)	milligrams per litre	Monthly during discharge	Grab sample																						
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pH	pH	Continuous during discharge	In line instrumentation																						
Turbidity	nephelometric turbidity units	Continuous during discharge	In line instrumentation																						
EPL	EPL	684/15.04.2025	M2.5	For the purpose of the above table, if monitoring results for aluminium (dissolved) exceed ANZG (2018) default guideline values (55ug/L for fresh water, pH >6.5), the licensee must notify the EPA with 7 days	Compliant																				
EPL	EPL	684/15.04.2025	M3.1	M3 TESTING METHODS - CONCENTRATION LIMITS Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.	Compliant																				
EPL	EPL	684/15.04.2025	M3.2	Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any test are conducted.	Compliant																				
EPL	EPL	684/15.04.2025	M4	Recording of pollution Compliants	Compliant																				
EPL	EPL	684/15.04.2025	M4.1	The licensee must keep a legible record of all Compliants made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	Compliant																				
EPL	EPL	684/15.04.2025	M4.2	The record must include details of the following: a) the date and time of the Compliant; b) the method by which the Compliant was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the Compliant; e) the action taken by the licensee in relation to the Compliant, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	Compliant																				
EPL	EPL	684/15.04.2025	M4.3	The record of a Compliant must be kept for at least 4 years after the Compliant was made.	Compliant																				
EPL	EPL	684/15.04.2025	M4.4	The record must be produced to any authorised officer of the EPA who asks to see them.	Compliant																				
EPL	EPL	684/15.04.2025	M5	Telephone Compliants line	Compliant																				
EPL	EPL	684/15.04.2025	M5.1	The licensee must operate during its operating hours a telephone Compliants line for the purpose of receiving any Compliants from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	Compliant																				
EPL	EPL	684/15.04.2025	M5.2	The licensee must notify the public of the Compliants line telephone number and the fact that it is a Compliants line so that the impacted community knows how to make a Compliant.	Compliant																				
EPL	EPL	684/15.04.2025	M5.3	The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.	Compliant																				
EPL	EPL	684/15.04.2025	6	Other monitoring and recording conditions	Compliant																				
EPL	EPL	684/15.04.2025		Ambient Dust Monitoring	Compliant																				

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
EPL	EPL	684/15.04.2025	M6.1	The licensee must operate and maintain a minimum of four ambient dust monitors capable of continuously monitoring and recording particulate emissions (including PM10) from the premises	Compliant
EPL	EPL	684/15.04.2025	M6.2	The continuous dust monitors must be placed at locations where they are sufficiently capable of monitoring and recording dust coming onto the premises, and dust being generated at the premises.	Compliant
EPL	EPL	684/15.04.2025		Weather Monitoring	Compliant
EPL	EPL	684/15.04.2025	M6.3	The licensee must monitor and record temperature, humidity, wind direction, wind velocity and rainfall at either the project weather station, or through analysis of equivalent weather information obtained from the Australian Bureau of Meteorology. Monitoring must: a) be representative of each catchment; b) commence prior to any works that may cause sediment or dust to leave the premises; and c) continue to be operated until soil disturbance activities cease at the premises and the site has been stabilised.	Compliant
		684/15.04.2025	6	Reporting Conditions	
EPL	EPL	684/15.04.2025	R1.1	R1 Annual return documents The licensee must complete and supply to the EPA an Annual Return in the approved form comprising: 1. a Statement of Compliance; 2. a Monitoring and Compliants Summary. 3. a Statement of Compliance - Licence Conditions,. 4. a Statement of Compliance - Load base Fee, 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan, 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and 7. a Statement of Compliance - Environmental Management Systems and Practices At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA	Compliant
EPL	EPL	684/15.04.2025	R1.2	An Annual Return must be prepared in respect of each reporting period, except as provided below	Compliant
EPL	EPL	684/15.04.2025	R1.3	Where this licence is transferred from the licensee to a new licensee: a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.	Compliant
EPL	EPL	684/15.04.2025	R1.4	Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on: a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.	Compliant
EPL	EPL	684/15.04.2025	R1.5	The Annual Return for the reporting period must be supplied to the EPA by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').	Compliant
EPL	EPL	684/15.04.2025	R1.6	The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.	Compliant
EPL	EPL	684/15.04.2025	R1.7	Within the Annual Return, the Statement of Compliance must be certified and the Monitoring and Compliants Summary must be signed by: a) the licence holder; or b) by a person approved in writing by the EPA to sign on behalf of the licence holder. Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.	Compliant
EPL	EPL	684/15.04.2025	R2.1	Notification of environmental harm Notifications must be made by telephoning the Environment Line service on 131 555	Compliant
EPL	EPL	684/15.04.2025	R2.2	The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred. Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
EPL	EPL	684/15.04.2025	R3.1	R3 Written report Where an authorised officer of the EPA suspects on reasonable grounds that: a) where this licence applies to premises, an event has occurred at the premises; or b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence, and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.	Compliant
EPL	EPL	684/15.04.2025	R3.2	The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.	Compliant
EPL	EPL	684/15.04.2025	R3.3	The request may require a report which includes any or all of the following information: a) the cause, time and duration of the event; b) the type, volume and concentration of every pollutant discharged as a result of the event; c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event; d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort; e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants; f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and g) any other relevant matters.	Compliant
EPL	EPL	684/15.04.2025	R3.4	The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.	Compliant
EPL	EPL	684/15.04.2025	7	GENERAL CONDITIONS	Compliant
EPL	EPL	684/15.04.2025	G1.1	G1 Copy of licence kept at the premises or plant A copy of this licence must be kept at the premises to which the licence applies	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
EPL	EPL	684/15.04.2025	G1.2	The licence must be produced to any authorised officer of the EPA who asks to see it.	Compliant
EPL	EPL	684/15.04.2025	G1.3	The licence must be available for inspection by any employee or agent of the licensee working at the premises.	Compliant
EPL	EPL	684/15.04.2025	G2.1	G2 Other general conditions Complete programs	Compliant
EPL	EPL	684/15.04.2025	8	Special Conditions	Compliant
EPL	EPL	684/15.04.2025	E1	Dewatering of pit water and discharge to Badgerys Creek	Compliant
EPL	EPL	684/15.04.2025		Dewatering of pit water and discharge to Badgerys Creek	Not Triggered
EPL	EPL	684/15.04.2025	E1.1	1The dewatering of pit water and discharge to Badgerys Creek may commence, in accordance with the provisions detailed in the document ‘Short-term Options Assessment’, prepared by ERM for CSR Limited, 12 March 2025, Ref 0606483, (EPA Ref DOC25/220655). 2 The licensee must notify the EPA in writing that dewatering to Badgerys Creek has commenced. 3 One month after commencement of the dewatering, the dewatering process must cease until notified by the EPA that dewatering can re-commence.	Not Triggered
EPL	EPL	684/15.04.2025	E1.2	Update of Discharge Impact Assessment (DIA) 1 One month after commencement of discharge to Badgerys Creek, the discharge process must cease and the licensee prepare an updated DIA, including updated discharge limits, based on the first month of discharge results. 2 The updated DIA will include the finalisation of the Surface Water Monitoring Plan (SWMP). This plan should include, but is not limited to: i. Identification of all pollutants to be monitored including total dissolved solids/electrical conductivity (EC), turbidity (NTU) and total suspended solids, pH, dissolved oxygen (DO), nutrients (including ammonia and nitrates), a full suite of metals; ii. Regular monitoring of field analytes (including EC, NTU, DO, pH) and periodic monitoring of a full suite of metals; iii. A wider monitoring suite and higher frequency of monitoring after rainfall; after specific water level triggers, (e.g. 50% 25% 10% etc); and after specific changes in water quality levels; iv. Water quality of the receiving waterway; v. Monitoring of rainfall; vi. Monitoring of discharge frequency and volumes; vii. Location of monitoring points; Frequency and method of monitoring. 3 The updated DIA must be submitted to the EPA prior to the commencement of discharge to Badgerys Creek. 4 The Licensee must not recommence discharge until approved to do so by the EPA	Not Triggered
EPL	EPL	684/15.04.2025	E1.3	Trigger Action Response Plan (TARP) 1 A TARP must be submitted to the EPA three months after the commencement of the initial discharging into Badgerys Creek. 2 The TARP needs to be based on the results of the initial monitoring period, at which point it will be reassessed by the EPA. 3 The TARP can be submitted as part of the Water Management Plan (WMP). The TARP should include, but is not limited to: i. Initially be based on results of initial monitoring period but have factored into it increasingly poor water quality towards the end of the dewatering process. ii. Discharge or management criteria for each analyte, where action will be triggered. iii. A sampling regime that is conducted more often than monthly. 4. The TARP can be submitted as part of the Water Management Plan 5. As or when the DIA is updated, TARP must be updated accordingly	Not Triggered

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
EPL	EPL	684/15.04.2025	E1.4	Water Management Plan Three months after commencement of discharge to Badgerys Creek, the licensee must submit the first version of a Water Management Plan (WMP) to the EPA. The WMP must include, but is not limited to: i. An ongoing Mitigation Options Report that adequately assesses: a. Additional treatment measures that adequately deal with any exceedances; b. Opportunities for re-use of water over discharge. ii. The Surface Water Monitoring Program; iii. The completed Trigger Action Response Plan, iv. A Site Water Balance Report that includes: a. a representation of the initial dewatering period followed by ongoing maintenance dewatering and reflecting changes to operational settings over the life of the project (e.g. changes to sub-catchment drainage); b. all water inputs to (e.g. direct rainfall, runoff, groundwater inflows, transfers) and outputs from the pits (e.g. evaporation, reuse, transfers, discharges); c. modelling based on a suitable, long-term dataset from a nearby meteorological station d. justification for key model assumptions	Not Triggered
EPL	EPL	684/15.04.2025	E1.5	Ongoing monitoring and reporting Following receipt of the WMP, ongoing monitoring and reporting requirements or other licence conditions may be placed on the licence.	Not Triggered
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	1	Notice to Landholders (a) Within a period of three months from the date of grant/renewal of this mining lease, the lease holder must serve on each landholder a notice in writing indicating that this mining lease has been granted/renewed and whether the lease includes the surface. A plan identifying each landholder and individual land parcel subject to the lease area, and a description of the lease area must accompany the notice. (b) If there are ten or more landholders, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this mining lease has been granted/renewed; state whether the lease includes the surface and must contain a plan and description of the lease area. If a notice is made under condition 1(b) compliance with condition 1(a) is not required	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	2	Rehabilitation Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	Mining Operations Plan and Annual Rehabilitation Report (a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	(b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which: (i) identifies areas that will be disturbed; (ii) details the staging of specific mining operations, mining purposes and prospecting; (iii) identifies how the mine will be managed and rehabilitated to achieve the post mining land use; (iv) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and (v) reflects the conditions of approval under: • the Environmental Planning and Assessment Act 1979; • the Protection of the Environment Operations Act 1997; and • any other approvals relevant to the development including the conditions of this mining lease	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	(c) The MOP must be prepared in accordance with the ESG3: Mining Operations Plan (MOP) Guidelines September 2013 published on the Department's website at www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-andforms/pgf/environmental-guidelines	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	(d) The lease holder may apply to the Minister to amend an approved MOP at any time.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	(e) It is not a breach of this condition if: (i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the Environmental Planning and Assessment Act 1979, the Protection of the Environment Operations Act 1997, the Work Health and Safety (Mines and Petroleum Sites) Act 2013 and Work Health and Safety (Mines and Petroleum Sites) Regulation 2014 or the Work Health and Safety Act 2011; and Work Health and Safety Regulation 2011 (ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	3	(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must: (i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP; (ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and (iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resourcesandenergy.nsw.gov.au/miners-andexplorers/rules-and-forms/pgf/environmental-guidelines <i>Note: The Rehabilitation Report replaces the Annual Environmental Management Report</i>	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	4	4. Non-Compliance Reporting (a) The lease holder must notify the Department upon becoming aware of any breaches of the conditions of this mining lease or breaches of the Mining Act or Regulations; (b) Notifications under condition 4(a) must be provided in the form specified on the Department's website within seven (7) days of the mining lease holder becoming aware of the breach.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	5	Environmental Incident Report The lease holder must provide environmental incident notifications and reports to the Secretary no later than seven (7) days after those environmental incident notifications and reports are provided to the relevant authorities under the Protection of the Environment Operations Act 1997.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	6	Resource Recovery The lease holder must optimise recovery of the minerals that are the subject of this mining lease to the extent economically feasible.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	7	Security The lease holder is required to provide and maintain a security deposit to secure funding for the fulfilment of obligations of all or any kind under the mining lease, including obligations of all or any kind under the mining lease that may arise in the future. The amount of the security deposit to be provided has been assessed by the Minister at \$2,104,000.	Compliant
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	8	Cooperation Agreement The lease holder must make every reasonable attempt, and be able to demonstrate its attempts, to enter into a cooperation agreement with the holder(s) of any overlapping title(s). The cooperation agreement should address but not be limited to issues such as: • access arrangements • operational interaction procedures • dispute resolution • information exchange • well location • timing of drilling • potential resource extraction conflicts; and • rehabilitation issues	Compliant

Document Name	Document Reference #	Schedule	Condition #	Compliance requirement	Compliance
Mining Lease	Mining Lease Application No. 536 Mining Lease #1771	ML	-	Exploration Reporting Note: Exploration Reports (Geological and Geophysical) The lease holder must lodge reports to the satisfaction of the Minister in accordance with section 163C of the Mining Act 1992 and in accordance with clause 59 of the Mining Regulation 2016. Reports must be prepared in accordance with Exploration Reporting: A guide for reporting on exploration and prospecting in New South Wales.	Compliant

Appendix F: Quarry Production Data - MEG

Client details

Client ID:	149272310
Client name:	BADGERYS CREEK QUARRY-PGH
RIMS ID:	323195

Return summary

Return type:	Non-coal Mineral
Frequency:	Annually
Period:	1 July 2024 - 30 June 2025
Due date:	31 July 2025
Revision:	1
Existing Attachments:	0

Attachment summary

Existing Attachments:	0
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Show

10

 entries

Advanced search

Lease name	Mineral / Extraction	Royalty regime	Rate	Quantity	Value	Royalty	Edit	Nil
ML 1771 (1992)	CLAY SHALE	Quantum Royalty	\$0.35 per tonne	65,032	-\$15,543.76	\$22,761.20	Edit	Nil
Totals					-\$15,543.76	\$22,761.20		

Showing 1-1 of 1 entries

Appendix G: Monitoring Results



CERTIFICATE OF ANALYSIS

Work Order	: ES2424671	Page	: 1 of 2
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: RUSSELL JARMAN	Contact	: Jason Dighton
Address	: Level 14 207 Kent Street SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 8586 8717	Telephone	: +61-2-8784 8555
Project	: 0606483 CSR Badgerys Creek	Date Samples Received	: 29-Jul-2024 13:52
Order number	: ----	Date Analysis Commenced	: 29-Jul-2024
C-O-C number	: ----	Issue Date	: 31-Jul-2024 13:48
Sampler	: SHANE WILLIAMS		
Site	: CSR-BADGERYS_CREEK		
Quote number	: EN/000		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW



General Comments

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

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

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

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

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

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

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

- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Sample ID

20240729_DIS

Sampling date / time

29-Jul-2024 12:00

Compound

CAS Number

LOR

Unit

ES2424671-001

Result

EG020F: Dissolved Metals by ICP-MS

Aluminium

7429-90-5

0.01

mg/L

<0.01

Reference	Sample	Sample	Sampling Comments	Temperature	pH	Electrical Conductivity	Dissolved Oxygen	Turbidity	NOx as N	Total Nitrogen	Phosphate as P	Total Phosphorus	Date Tested - Ammonia	Ammonia as N
	Description	Date		°C	pH Units	µS/cm 25°C	mg/L	NTU	mg/L	mg/L	mg/L	mg/L	--	mg/L
Units				0.1	0.1	50	0.1	0.5	0.005	0.1	0.005	0.05		0.02
PQL				Temp	PHA 4500-H	APHA 2510 B	APHA 4500-O G	APHA 2130 I	EXT	EXT	EXT	EXT	4500-NH3	F 4500-NH3
Method														
16157/1	Badgers Creek Confluence	22/05/2024 10:31	No visible flow	13.6	7.3	1,460	6.5	120	0.2	1	0.04	0.2	28/05/2024	0.1
16157/2	Badgers Creek Upstream	22/05/2024 10:12	No visible flow	13.5	7.3	1,430	6.8	110	0.2	1.2	0.04	0.2	28/05/2024	0.07
16157/3	Badgers Creek Downstream	22/05/2024 09:38	No visible flow	14.2	7.3	1,560	7.8	45	0.2	1.4	0.076	0.3	28/05/2024	0.09
16157/4	South Creek Upstream	22/05/2024 11:10	No visible flow	14.2	7.3	901	6.9	75	1.2	1.7	0.18	0.3	28/05/2024	0.1
16157/5	South Creek Downstream	22/05/2024 11:43	Gentle flow observed at shallow section	14.2	7.4	895	7.9	65	1	1.5	0.14	0.2	28/05/2024	0.07
16157/6	Dup' (Badgers Creek Downstream)	22/05/2024 09:44	No visible flow	14.3	7.3	1,560	7.7	45	0.2	1.3	0.07	0.3	28/05/2024	0.09
16344/1	Badgers Creek Confluence	19/06/2024 09:33	No visible flow	9.7	7.5	1,460	8.2	65	0.75	1.5	0.064	0.2	24/06/2024	0.04
16344/2	Badgers Creek Upstream	19/06/2024 09:56	Visible flow in shallow section	9.9	7.5	1,460	8.1	70	0.81	1.5	0.066	0.2	24/06/2024	0.04
16344/3	Badgers Creek Downstream	19/06/2024 09:12	No visible flow	10.3	7.4	1,460	8.9	90	1.1	1.4	0.051	0.2	24/06/2024	0.05
16344/4	South Creek Upstream	19/06/2024 10:31	No visible flow	11	7.4	985	8.4	100	1.2	1.7	0.1	0.3	24/06/2024	0.07
16344/5	South Creek Downstream	19/06/2024 11:16	No visible flow	11	7.5	944	8.9	100	1.2	1.5	0.096	0.3	24/06/2024	0.05
16344/6	Dup' (South Creek Upstream)	19/06/2024 10:39	No visible flow	11.1	7.4	985	8.3	100	1.3	1.6	0.11	0.3	24/06/2024	0.07
16559/1	Badgers Creek Confluence	17/07/2024 11:02	Slight visible flow	11.2	7.5	1,930	9.3	37	0.61	1.2	0.02	0.1	22/07/2024	0.04
16559/2	Badgers Creek Upstream	17/07/2024 11:22	Slight visible flow	11.6	7.5	1,940	8.7	33	0.68	1.3	0.03	0.1	22/07/2024	0.04
16559/3	Badgers Creek Downstream	17/07/2024 10:47	Slight visible flow	12.1	7.5	1,910	10.9	30	0.4	1.3	<0.005	0.1	22/07/2024	0.03
16559/4	South Creek Upstream	17/07/2024 11:50	Slight visible flow	12.1	7.3	1,140	8.6	60	0.96	1.7	0.15	0.3	22/07/2024	0.23
16559/5	South Creek Downstream	17/07/2024 12:21	Slight visible flow	14.6	7.5	1,140	11.7	55	0.94	1.3	0.096	0.2	22/07/2024	0.06
16559/6	Dup' (Badgers Creek Confluence)	17/07/2024 11:08	Slight visible flow	11.4	7.5	1,930	9	36	0.56	1.3	0.02	0.1	22/07/2024	0.04
16668/1	Badgers Creek Confluence	14/08/2024 11:40	Clear, no visible flow	15.1	7.7	2,490	10.5	23	2.2	3.6	<0.005	0.07	21/08/2024	<0.02
16668/2	Badgers Creek Upstream	14/08/2024 11:57	Clear, no visible flow	14.9	7.7	2,490	10.2	26	2.4	3.6	<0.005	0.08	21/08/2024	<0.02
16668/3	Badgers Creek Downstream	14/08/2024 11:24	Clear, no visible flow	15.1	7.6	2,590	10.3	18	1.5	2	<0.005	0.06	21/08/2024	<0.02
16668/4	South Creek Upstream	14/08/2024 12:58	Clear, no visible flow	14.4	7.3	1,770	6.4	19	0.89	2.3	0.19	0.3	21/08/2024	0.26
16668/5	South Creek Downstream	14/08/2024 13:34	Clear, no visible flow	16.3	7.4	1,800	8.2	19	0.99	2	0.078	0.2	21/08/2024	0.06
16668/6	Dup' U/S Badgers Creek	14/08/2024 12:05	Clear, no visible flow	14.9	7.7	2,490	9.9	28	2.3	3.6	<0.005	0.07	21/08/2024	0.02
16793/1	Badgers Creek Confluence	11/09/2024 10:48	No visible flow	16.1	7.7	2,440	8.3	95	<0.005	1	0.01	0.2	18/09/2024	0.03
16793/2	Badgers Creek Upstream	11/09/2024 11:06	No visible flow	16.1	7.7	2,590	8.6	110	<0.005	1.4	0.01	0.3	18/09/2024	0.03
16793/3	Badgers Creek Downstream	11/09/2024 10:19	No visible flow	15.5	7.5	1,810	7	30	0.06	0.8	0.03	0.2	18/09/2024	0.14
16793/4	South Creek Upstream	11/09/2024 11:47	No visible flow	16.1	7.5	1,840	8	14	0.79	1.4	0.1	0.2	18/09/2024	0.02
16793/5	South Creek Downstream	11/09/2024 12:23	No visible flow	16.9	7.4	1,400	7.4	27	0.3	1	0.04	0.1	18/09/2024	0.05
16793/6	Dup' (D/S Badgers Creek)	11/09/2024 10:27	No visible flow	15.7	7.5	1,810	7.1	30	0.05	0.8	0.03	0.2	18/09/2024	0.14
16875/1	Badgers Creek Confluence	09/10/2024 12:06	No visible flow	16.4	7.5	3,560	5.7	70	<0.005	0.8	0.005	0.2	14/10/2024	0.02
16875/2	Badgers Creek Upstream	09/10/2024 12:24	No visible flow	15.9	7.5	3,560	5.6	80	<0.005	0.9	0.005	0.1	14/10/2024	0.02
16875/3	Badgers Creek Downstream	09/10/2024 11:38	No visible flow	16.1	7.3	3,640	4.4	36	0.006	0.8	0.006	0.1	14/10/2024	0.02
16875/4	South Creek Upstream	09/10/2024 12:57	No visible flow	16.3	7.6	1,740	3.2	24	1.1	1.5	0.14	0.3	14/10/2024	0.15
16875/5	South Creek Downstream	09/10/2024 13:19	No visible flow	15.8	7.5	1,590	5.4	19	0.8	1.1	0.087	0.2	14/10/2024	0.07
16875/6	Dup' (Badgers Creek Downstream)	09/10/2024 11:48	No visible flow	16	7.3	3,640	4.4	35	<0.005	0.9	0.005	0.1	14/10/2024	0.02
17029/1	Badgers Creek Confluence	06/11/2024 10:41	No flow	22.2	7.5	3,740	5.3	45	0.02	0.8	0.01	0.1	07/11/2024	0.08
17029/2	Badgers Creek Upstream	06/11/2024 11:02	No flow	21.2	7.4	3,740	3.9	45	0.01	0.8	0.007	0.2	07/11/2024	0.05
17029/3	Badgers Creek Downstream	06/11/2024 10:09	No flow	20.4	7.3	1,930	6	22	0.03	1.4	0.38	0.68	07/11/2024	0.03
17029/4	South Creek Upstream	06/11/2024 11:41	No flow, Clear	22.6	7.4	1,820	4.3	9.8	2.8	3.5	0.29	0.5	07/11/2024	0.24
17029/5	South Creek Downstream	06/11/2024 12:13	No flow, Clear	21.2	7.5	1,800	5.6	8.6	0.1	0.7	0.097	0.2	07/11/2024	0.1
17029/6	Dup' (South Creek U/S)	06/11/2024 11:47	No flow, Clear	22.6	7.4	1,820	4.2	9.7	2.7	3.5	0.3	0.5	07/11/2024	0.26
17145/1	Badgers Creek Confluence	04/12/2024 10:24	No visible flow	24.8	7.6	1,870	5.5	95	0.2	0.9	0.03	0.2	11/12/2024	<0.02
17145/2	Badgers Creek Upstream	04/12/2024 10:42	No visible flow	24.5	7.6	1,860	5.6	95	0.3	0.8	0.03	0.2	11/12/2024	0.02
17145/3	Badgers Creek Downstream	04/12/2024 09:58	No visible flow	24.2	7.5	1,870	5.1	85	0.2	0.8	0.03	0.2	11/12/2024	<0.02
17145/4	South Creek Upstream	04/12/2024 11:16	No visible flow	24.8	7.4	834	4.3	36	1.5	1.6	0.03	0.4	11/12/2024	0.06
17145/5	South Creek Downstream	04/12/2024 11:39	No visible flow	24.1	7.4	854	6.1	27	0.66	1	0.28	0.3	11/12/2024	0.02
17145/6	Dup' Sth Crk D/S	04/12/2024 11:45	No visible flow	24.2	7.4	856	6.2	27	0.66	1	0.04	0.3	11/12/2024	<0.02
17446/1	Badgers Creek Confluence	29/01/2025 09:57	No visible flow	23.7	7.4	1,880	2.4	80	0.01	2.5	0.01	0.2	31/01/2025	<0.02
17446/2	Badgers Creek Upstream	29/01/2025 10:12	No visible flow	22.9	7.4	1,920	2.3	90	<0.005	1.6	0.01	0.2	31/01/2025	0.02
17446/3	Badgers Creek Downstream	29/01/2025 10:23	No visible flow	22.6	7.2	2,060	2.6	23	0.02	2.2	0.071	0.3	31/01/2025	0.05

Reference	Sample Description	Sample Date	Sampling Comments	Temperature °C 0.1 Temp	pH pH Units 0.1 pH 4500-H	Electrical Conductivity µS/cm 25°C 50 APHA 2510 B	Dissolved Oxygen mg/L 0.1 APHA 4500-O G	Turbidity NTU 0.5 APHA 2130 I	NOx as N mg/L 0.005 EXT	Total Nitrogen mg/L 0.1 EXT	Phosphate as P mg/L 0.005 EXT	Total Phosphorus mg/L 0.05 EXT	Date Tested - Ammonia 4500-NH3 F	Ammonia as N mg/L 0.02 F
Units PQL Method														
17446/4	South Creek Upstream	29/01/2025 11:19	No visible flow	24.3	7.3	850	3.1	31	0.82	2	0.2	0.4	31/01/2025	<0.02
17446/5	South Creek Downstream	29/01/2025 11:41	No visible flow	23.9	7.4	1,320	3.9	20	0.2	1.4	0.097	0.2	31/01/2025	0.03
17446/6	Dup' (Badgerys Creek Downstream)	29/01/2025 10:30	No visible flow	22.6	7.1	2,070	2.5	24	0.02	2	0.07	0.4	31/01/2025	0.05
17574/1	Badgerys Creek Confluence	26/02/2025 10:49	No visible flow	23.5	7.4	2,380	3.5	70	<0.005	1.4	0.01	0.1	03/03/2025	0.03
17574/2	Badgerys Creek Upstream	26/02/2025 11:10	No visible flow	23.1	7.4	2,420	3.5	65	<0.005	1.4	0.009	0.2	03/03/2025	0.03
17574/3	Badgerys Creek Downstream	26/02/2025 10:26	No visible flow	21.8	7.2	2,560	3.2	16	0.01	1.1	0.02	0.1	03/03/2025	0.03
17574/4	South Creek Upstream	26/02/2025 11:49	No visible flow	23.7	7.4	920	4.4	33	3.1	4.1	0.54	0.76	03/03/2025	0.02
17574/5	South Creek Downstream	26/02/2025 12:27	No visible flow	24.5	7.5	1,580	4.9	19	0.2	1.3	0.088	0.2	03/03/2025	0.07
17574/6	Dup' (South Creek U/S)	26/02/2025 11:58	No visible flow	23.8	7.4	922	4.5	33	3.1	4.8	0.55	0.82	03/03/2025	0.02
17689/1	Badgerys Creek Confluence	26/03/2025 10:47	No visible flow	23	7.5	2,100	4.8	50	0.2	1	0.02	0.1	01/04/2025	0.09
17689/2	Badgerys Creek Upstream	26/03/2025 11:05	No visible flow	23	7.5	2,050	4.9	50	0.2	1.1	0.02	0.1	01/04/2025	0.1
17689/3	Badgerys Creek Downstream	26/03/2025 10:19	No visible flow	22.2	7.4	2,030	5.2	28	0.05	1	0.19	0.4	01/04/2025	0.06
17689/4	South Creek Upstream	26/03/2025 11:49	No visible flow	22.7	7.4	1,030	4.8	15	3.7	4	0.62	0.8	01/04/2025	0.05
17689/5	South Creek Downstream	26/03/2025 12:17	Gentle visible flow	22.8	7.5	1,350	5.1	15	3.7	3.8	0.55	0.73	01/04/2025	0.07
17689/6	Dup' (Badgerys Creek D/S)	26/03/2025 10:27	No visible flow	22.3	7.4	2,030	5.3	29	0.05	1	0.2	0.4	01/04/2025	0.06
17835/1	Badgerys Creek Confluence	23/04/2025 10:34	No visible flow	19.3	7.6	2,200	5.9	60	<0.005	1.4	0.02	0.2	01/05/2025	0.02
17835/2	Badgerys Creek Upstream	23/04/2025 10:54	No visible flow	20	7.5	2,230	5.7	70	<0.005	1.6	0.02	0.2	01/05/2025	0.02
17835/3	Badgerys Creek Downstream	23/04/2025 10:18	No visible flow	18.3	7.4	2,220	3.7	21	0.05	1.2	0.03	0.1	01/05/2025	0.12
17835/4	South Creek Upstream	23/04/2025 11:28	No visible flow	19.1	7.4	1,070	5.5	9.9	6	9.2	0.96	1.3	01/05/2025	0.03
17835/5	South Creek Downstream	23/04/2025 12:02	No visible flow	18.8	7.4	1,220	4.8	6.5	3	5.1	0.3	0.4	01/05/2025	0.04
17835/6	Dup' (South Creek Upstream)	23/04/2025 11:34	No visible flow	19.3	7.4	1,080	5.6	10	6	9.1	0.98	1.3	01/05/2025	0.03

Reference	Description	Sample Description	Sample Date	Date & Time On	Date & Time Sampled	Sampling Comments	General Comments/Non Compliance	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
Units PQL Method								days AS 3580.10.1	g/m2/mth 0.1 AS 3580.10.1	g/m2/mth 0.1 AS 3580.10.1	g/m2/mth 0.1 AS 3580.10.1	mm 1 AS 3580.10.1
16152/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	21/05/2024	23/04/2024 12:19	21/05/2024 12:02			28	0.5	0.2	0.3	91
16152/2	Badgerys Creek - Dusts	D2 Hay Shed	21/05/2024	23/04/2024 11:47	21/05/2024 12:32			28	0.4	0.1	0.3	70
16152/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	21/05/2024	23/04/2024 12:54	21/05/2024 11:23			28	0.6	0.3	0.3	76
16152/4	Badgerys Creek - Dusts	D4 Old House	21/05/2024	23/04/2024 12:29	21/05/2024 11:41	Insects		28	4.4	2.2	2.2	105
16338/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	18/06/2024	21/05/2024 12:02	18/06/2024 12:39	Insects		28	2.6	1.1	1.5	89
16338/2	Badgerys Creek - Dusts	D2 Hay Shed	18/06/2024	21/05/2024 12:32	18/06/2024 12:07			28	0.4	0.2	0.2	92
16338/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	18/06/2024	21/05/2024 11:23	18/06/2024 13:20	Spider		28	1	0.3	0.7	81
16338/4	Badgerys Creek - Dusts	D4 Old House	18/06/2024	21/05/2024 11:41	18/06/2024 12:49	Minor algae		28	1	0.4	0.6	94
16554/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	16/07/2024	18/06/2024 12:39	16/07/2024 12:46	Minor seeds. Dead mouse in funnel		28	1.2	1	0.2	40
16554/2	Badgerys Creek - Dusts	D2 Hay Shed	16/07/2024	18/06/2024 12:07	16/07/2024 12:10			28	<0.1	<0.1	<0.1	41
16554/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	16/07/2024	18/06/2024 13:20	16/07/2024 13:40	Funnel neck broken in bottle. Funnel replaced.		28	1.2	1.1	0.1	34
16660/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	13/08/2024	16/07/2024 12:46	13/08/2024 12:03			28	0.7	0.4	0.3	24
16660/2	Badgerys Creek - Dusts	D2 Hay Shed	13/08/2024	16/07/2024 12:10	13/08/2024 11:23	Minor bird droppings		28	0.7	0.4	0.3	22
16660/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	13/08/2024	16/07/2024 13:40	13/08/2024 11:48			28	0.4	0.3	0.1	20
16660/4	Badgerys Creek - Dusts	D4 Old House	13/08/2024	18/06/2024 12:49	13/08/2024 12:17	Major algae, insects, bird droppings. 56 day runtime (not changed out last month)	Sample not changed out last month	56	0.2	0.4	<0.1	73
16788/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	10/09/2024	13/08/2024 12:03	10/09/2024 14:17	Insects		28	0.8	0.4	0.4	16
16788/2	Badgerys Creek - Dusts	D2 Hay Shed	10/09/2024	13/08/2024 11:23	10/09/2024 13:51	Minor insects		28	<0.1	<0.1	<0.1	20
16788/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	10/09/2024	13/08/2024 11:48	10/09/2024 14:53	Minor insects		28	0.5	0.3	0.2	10
16788/4	Badgerys Creek - Dusts	D4 Old House	10/09/2024	13/08/2024 12:17	10/09/2024 14:26	Dry. Seeds. Bird droppings in funnel		28	0.6	0.1	0.5	<1
16863/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	08/10/2024	10/09/2024 14:17	08/10/2024 12:24	Major insects		28	0.4	0.3	0.1	45
16863/2	Badgerys Creek - Dusts	D2 Hay Shed	08/10/2024	10/09/2024 13:51	08/10/2024 11:46	Minor insects		28	0.5	0.4	0.1	48
16863/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	08/10/2024	10/09/2024 14:53	08/10/2024 12:13	Insects		28	0.9	0.6	0.3	38
16863/4	Badgerys Creek - Dusts	D4 Old House	08/10/2024	10/09/2024 14:26	08/10/2024 12:37	Vegetation		28	0.7	0.5	0.2	41
17024/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	05/11/2024	08/10/2024 12:24	05/11/2024 12:17	Insects		28	0.7	0.4	0.3	36
17024/2	Badgerys Creek - Dusts	D2 Hay Shed	05/11/2024	08/10/2024 11:46	05/11/2024 11:24	Insects		28	1.7	0.7	1	31
17024/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	05/11/2024	08/10/2024 12:13	05/11/2024 11:49	Major insects, algae		28	1.4	0.5	0.9	11
17024/4	Badgerys Creek - Dusts	D4 Old House	05/11/2024	08/10/2024 12:37	05/11/2024 12:31	Insects		28	1.8	1.1	0.7	21
17140/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	03/12/2024	05/11/2024 12:17	03/12/2024 12:26	Major insects		28	1.5	0.7	0.8	71
17140/2	Badgerys Creek - Dusts	D2 Hay Shed	03/12/2024	05/11/2024 11:24	03/12/2024 11:47	Major beetles, algae		28	2.6	1	1.6	44
17140/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	03/12/2024	05/11/2024 11:49	03/12/2024 12:09	Vegetation, beetles, algae		28	2.1	0.8	1.3	42
17140/4	Badgerys Creek - Dusts	D4 Old House	03/12/2024	05/11/2024 12:31	03/12/2024 12:34	Major vegetation, beetles, algae		28	9.9	1.7	8.2	63
17268/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	31/12/2024	03/12/2024 12:26	31/12/2024 09:56	Beetles, bird droppings, algae		28	2.4	0.6	1.8	32
17268/2	Badgerys Creek - Dusts	D2 Hay Shed	31/12/2024	03/12/2024 11:47	31/12/2024 09:19	Major beetles		28	1.8	0.4	1.4	36
17268/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	31/12/2024	03/12/2024 12:09	31/12/2024 09:40	Dry. Major beetles		28	9.6	4.1	5.5	<1
17268/4	Badgerys Creek - Dusts	D4 Old House	31/12/2024	03/12/2024 12:34	31/12/2024 10:08	Major beetles		28	4.8	0.5	4.3	13
17392/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	28/01/2025	31/12/2024 09:56	28/01/2025 11:27	Major insects, bird droppings, algae		28	2.5	1	1.5	84
17392/2	Badgerys Creek - Dusts	D2 Hay Shed	28/01/2025	31/12/2024 09:19	28/01/2025 09:57	Major seeds, owl pellet		28	5.9	2	3.9	70
17392/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	28/01/2025	31/12/2024 09:40	28/01/2025 11:02	Major insects, vegetation, algae		28	2.8	1.3	1.5	51
17392/4	Badgerys Creek - Dusts	D4 Old House	28/01/2025	31/12/2024 10:08	28/01/2025 12:24	Major beetles		28	1.1	0.3	0.8	71
17568/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	25/02/2025	28/01/2025 11:27	25/02/2025 11:42	Insects, minor algae, minor bird droppings		28	2.9	1	1.9	73
17568/2	Badgerys Creek - Dusts	D2 Hay Shed	25/02/2025	28/01/2025 09:57	25/02/2025 11:05	Insects, algae, bird droppings		28	1.5	0.8	0.7	68
17568/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	25/02/2025	28/01/2025 11:02	25/02/2025 11:29	Insects, algae		28	2.9	2	0.9	56
17568/4	Badgerys Creek - Dusts	D4 Old House	25/02/2025	28/01/2025 12:24	25/02/2025 11:51	Major insects & algae		28	11.6	3.8	7.8	62
17684/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	25/03/2025	25/02/2025 11:42	25/03/2025 12:07	Bird droppings, seeds. Seeds blocking funnel.		28	1.7	1.1	0.6	67

Reference	Description	Sample Description	Sample Date	Date & Time On	Date & Time Sampled	Sampling Comments	General Comments/Non Compliance	Number of Days	Insoluble Solids	Ash	Combustible Matter	Calculated Rain
Units								days	g/m2/mth	g/m2/mth	g/m2/mth	mm
PQL									0.1	0.1	0.1	1
Method								AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1	AS 3580.10.1
17684/2	Badgerys Creek - Dusts	D2 Hay Shed	25/03/2025	25/02/2025 11:05	25/03/2025 11:27	Minor insects, minor bird droppings, minor vegetation, minor algae		28	1.3	0.7	0.6	59
17684/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	25/03/2025	25/02/2025 11:29	25/03/2025 11:51	Major seeds & bird droppings, algae		28	1.9	0.8	1.1	58
17684/4	Badgerys Creek - Dusts	D4 Old House	25/03/2025	25/02/2025 11:51	25/03/2025 12:21	Funnel broken - Funnel replaced		28	2.7	2.2	0.5	12
17829/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	22/04/2025	25/03/2025 12:07	22/04/2025 12:01	Minor insects		28	0.9	0.6	0.3	45
17829/2	Badgerys Creek - Dusts	D2 Hay Shed	22/04/2025	25/03/2025 11:27	22/04/2025 11:23	Minor insects		28	1	0.9	0.1	45
17829/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	22/04/2025	25/03/2025 11:51	22/04/2025 11:47	Very dark, major seeds in funnel		28	2.2	0.4	1.8	30
17829/4	Badgerys Creek - Dusts	D4 Old House	22/04/2025	25/03/2025 12:21	22/04/2025 12:13	Organic matter, owl pellet blocking funnel		28	5.5	1.6	3.9	40
18032/1	Badgerys Creek - Dusts	D1 Martin Rd - Near Resident	20/05/2025	22/04/2025 12:01	20/05/2025 11:43	Minor insects, minor algae		28	1.3	0.6	0.7	72
18032/2	Badgerys Creek - Dusts	D2 Hay Shed	20/05/2025	22/04/2025 11:23	20/05/2025 11:02			28	1	0.5	0.5	76
18032/3	Badgerys Creek - Dusts	D3 Bundwall Near Inghams	20/05/2025	22/04/2025 11:47	20/05/2025 11:20	Major bird droppings & seeds, algae. Bird droppings blocking funnel.		28	16.9	12.5	4.4	56
18032/4	Badgerys Creek - Dusts	D4 Old House	20/05/2025	22/04/2025 12:13	20/05/2025 11:54	Minor insects		28	0.9	0.4	0.5	60

Reference	Description	Sample Description	Date & Time On	Date of Operation	Date & Time Sampled	Sampling Comments	Weather	Est Mean Temperature (DF 20.0)	Est Mean Pressure (DF 101.3)	Volume Air Sampled	Particulates per filter	~Particulates @ 0°C, 101.3kPa
Units PQL Method								°C	kPa	m3	µg/filter 400 VGT-WI/44	µg/m3 2 VGT-WI/44
16080/1	Badgerys Creek HVAS	PM 10	26/03/2024 13:00	29/03/2024	23/04/2024 12:15	Paper overrun	Fine	28.6	101.3	7,354	97,000	13
16298/1	Badgerys Creek HVAS	PM 10	23/04/2024 12:15	28/04/2024	21/05/2024 11:50	Paper overrun	Fine	24.7	101.3	5,961	68,400	11
16449/1	Badgerys Creek HVAS	PM 10	21/05/2024 12:05	22/05/2024	18/06/2024 12:30	Paper overrun	Fine	20	101.3	7,572	83,800	11
16616/1	Badgerys Creek HVAS	PM 10	18/06/2024 12:30	21/06/2024	16/07/2024 12:45	Paper ran multiple times over the month	Fine	17	101.3	7,650	68,700	9
16738/1	Badgerys Creek HVAS	PM 10	16/07/2024 13:20	21/07/2024	21/07/2024 11:59	Nil, cows and sheep only	Windy	17.5	101.3	1,528	10,100	7
16738/2	Badgerys Creek HVAS	PM 10	23/07/2024	27/07/2024	13/08/2024 12:00		Sunny	19	101.3	4,562	66,600	15
16852/1	Badgerys Creek HVAS	PM 10	13/08/2024 12:00	14/08/2024	Not provided	Final runtime not recorded by client. Time recorded taken from following paper - likely incorrect	Cloudy	20	101.3	4,523	43,500	10
16852/2	Badgerys Creek HVAS	PM 10	13/08/2024 12:30	23/08/2024	10/09/2024 14:20		Sunny	25.1	101.3	2,976	63,700	21
16971/1	Badgerys Creek HVAS	PM 10	10/09/2024 14:45	13/09/2024	03/10/2024	Sprinkler, cattler grazing, trail bikes. Paper ran 4 times.	Fine	25.2	101.3	5,952	136,300	23
16971/2	Badgerys Creek HVAS	PM 10	03/10/2024 10:14	06/10/2024	08/10/2024 12:30		Fine	20.4	101.3	1,512	18,400	12
17085/1	Badgerys Creek HVAS	PM 10	08/10/2024 12:30	12/10/2024	05/11/2024 12:00		Light rain	21.3	101.3	6,029	72,800	12
17228/1	Badgerys Creek HVAS	PM 10	05/11/2024 12:30	06/11/2024	03/12/2024 12:20	Paper Overrun	Cloudy	28.5	101.3	7,358	104,100	14
17288/1	Badgerys Creek HVAS	PM 10	03/12/2024 12:20	06/12/2024	31/12/2024 09:50	Paper Overrun	Cloudy	29.5	101.3	7,334	129,900	18
17479/1	Badgerys Creek HVAS	PM 10	31/12/2024	05/01/2025	28/01/2025 11:20	Paper Overrun	Cloudy	34	101.3	5,730	87,800	15
17625/1	Badgerys Creek HVAS	PM 10	28/01/2025 11:25	29/01/2025	25/02/2025 11:40	Paper Overrun	Sunny	32.1	101.3	7,207	109,500	15
17748/1	Badgerys Creek HVAS	PM 10	25/02/2025 12:05	28/02/2025	25/03/2025 12:03	Ran 5 times on one paper.	Cloudy	26.4	101.3	7,410	105,500	14
17920/1	Badgerys Creek HVAS	PM 10	25/03/2025 12:08	30/03/2025	22/04/2025 11:59	Paper overrun	Cloudy	25.4	101.3	5,949	110,900	19
18140/1	Badgerys Creek HVAS	PM 10	22/04/2025 12:20	23/04/2025	20/05/2025 11:35	Paper overrun multiple days	Fine	21.9	101.3	7,523	93,200	12
18334/1	Badgerys Creek HVAS	PM 10	20/05/2025	23/05/2025	18/06/2025	Paper overrun multiple days	Fine	18.1	101.3	7,621	69,700	9
18506/1	Badgerys Creek HVAS	PM 10	18062025 10:40	22/06/2025	15/07/2025 11:03	Paper overrun multiple days	Fine	11.8	101.3	6,232	98,700	16



CERTIFICATE OF ANALYSIS

Work Order	: ES2417525	Page	: 1 of 9
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: RUSSELL JARMAN	Contact	: Jason Dighton
Address	: Level 14 207 Kent Street SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 8586 8717	Telephone	: +61-2-8784 8555
Project	: 0606483 CSR Badgerys Creek	Date Samples Received	: 28-May-2024 17:45
Order number	: 0606483	Date Analysis Commenced	: 29-May-2024
C-O-C number	: ----	Issue Date	: 05-Jun-2024 17:58
Sampler	: TAVISHI PEIRIS		
Site	: ----		
Quote number	: EN/000		
No. of samples received	: 14		
No. of samples analysed	: 14		



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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

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



General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H⁺ to the Cations and Nitrate, SiO₂ and Fluoride to the Anions.
- EP080: Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEXN compounds spiked at 20 ug/L.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BW1	MW4	BW2a	MW1	BW2b
Sampling date / time					27-May-2024 00:00	27-May-2024 00:00	27-May-2024 00:00	27-May-2024 00:00	28-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2417525-001	ES2417525-002	ES2417525-003	ES2417525-004	ES2417525-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.00	7.49	7.52	6.84	7.50
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		9490	18300	8440	26400	8280
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		5730	12600	5180	19100	5170
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		273	668	404	305	981
Total Alkalinity as CaCO3	----	1	mg/L		273	668	404	305	981
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		320	794	139	765	595
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		2720	5570	2420	8390	1900
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		10	259	102	96	73
Magnesium	7439-95-4	1	mg/L		172	719	194	1040	209
Sodium	7440-23-5	1	mg/L		1400	3600	1390	4490	1480
Potassium	7440-09-7	1	mg/L		2	18	24	7	20
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.001	0.002	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		0.005	0.001	0.018	0.058	0.004
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L		0.007	0.001	<0.001	0.010	0.002
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	BW1	MW4	BW2a	MW1	BW2b
Sampling date / time					27-May-2024 00:00	27-May-2024 00:00	27-May-2024 00:00	27-May-2024 00:00	28-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2417525-001	ES2417525-002	ES2417525-003	ES2417525-004	ES2417525-005
					Result	Result	Result	Result	Result
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		88.8	187	79.2	259	85.6
ø Total Cations	----	0.01	meq/L		75.6	229	82.1	286	85.7
ø Ionic Balance	----	0.01	%		8.05	10.1	1.80	4.99	0.08



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				D01_240527	BW4a	BW4b	BW5a	BW5b
Sampling date / time				28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00
Compound	CAS Number	LOR	Unit	ES2417525-006	ES2417525-007	ES2417525-008	ES2417525-009	ES2417525-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.50	7.40	7.09	7.30	7.36
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	19000	19500	21100	25200	14200
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	12400	12400	15200	17200	8820
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	682	579	684	891	745
Total Alkalinity as CaCO3	----	1	mg/L	682	579	684	891	745
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	846	175	<1	331	2
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	5650	6140	6780	7910	4470
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	262	231	643	336	298
Magnesium	7439-95-4	1	mg/L	735	425	328	640	191
Sodium	7440-23-5	1	mg/L	3580	3470	3600	4290	2250
Potassium	7440-09-7	1	mg/L	18	12	68	24	43
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L	0.001	0.223	0.005	0.004	0.005
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	7440-02-0	0.001	mg/L	0.001	0.010	<0.001	0.004	0.002
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	D01_240527	BW4a	BW4b	BW5a	BW5b
Sampling date / time					28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00	28-May-2024 00:00
Compound	CAS Number	LOR	Unit		ES2417525-006	ES2417525-007	ES2417525-008	ES2417525-009	ES2417525-010
					Result	Result	Result	Result	Result
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		191	188	205	248	141
ø Total Cations	----	0.01	meq/L		230	198	217	257	130
ø Ionic Balance	----	0.01	%		9.31	2.42	2.96	1.75	4.24



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Sample ID

				R01_240527	R012405_28	TS	TB	----
Sampling date / time				27-May-2024 00:00	28-May-2024 00:00	21-May-2024 00:00	21-May-2024 00:00	----
Compound	CAS Number	LOR	Unit	ES2417525-011	ES2417525-012	ES2417525-013	ES2417525-014	-----
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	5.75	5.56	----	----	---
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	<1	<1	----	----	---
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	<10	<10	----	----	---
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	----	----	---
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	----	----	---
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	----	----	---
Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	----	----	---
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	----	----	---
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	<1	----	----	---
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	<1	----	----	---
Magnesium	7439-95-4	1	mg/L	<1	<1	----	----	---
Sodium	7440-23-5	1	mg/L	<1	<1	----	----	---
Potassium	7440-09-7	1	mg/L	<1	<1	----	----	---
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	----	----	---
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	----	----	---
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	----	----	---
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	----	----	---
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	----	----	---
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	----	----	---
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	---



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Sample ID

				R01_240527	R012405_28	TS	TB	----
Sampling date / time				27-May-2024 00:00	28-May-2024 00:00	21-May-2024 00:00	21-May-2024 00:00	----
Compound	CAS Number	LOR	Unit	ES2417525-011	ES2417525-012	ES2417525-013	ES2417525-014	-----
				Result	Result	Result	Result	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	<0.01	<0.01	----	----	----
ø Total Cations	----	0.01	meq/L	<0.01	<0.01	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	----	----	----	<20	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	----	----	----	<20	----
[^] C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	----	----	----	<20	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	----	----	16	<1	----
Toluene	108-88-3	2	µg/L	----	----	14	<2	----
Ethylbenzene	100-41-4	2	µg/L	----	----	14	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	----	----	14	<2	----
ortho-Xylene	95-47-6	2	µg/L	----	----	15	<2	----
[^] Total Xylenes	----	2	µg/L	----	----	29	<2	----
[^] Sum of BTEX	----	1	µg/L	----	----	73	<1	----
Naphthalene	91-20-3	5	µg/L	----	----	19	<5	----
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	2	%	----	----	110	119	----
Toluene-D8	2037-26-5	2	%	----	----	101	106	----
4-Bromofluorobenzene	460-00-4	2	%	----	----	101	106	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137

Well ID	Easting	Northing	Surface Elevation (mAHD)	Depth to Bottom (mBTC)	Date	SWL (mbtoc)	SWL (mAHD)
BW1	291741	6247174	56.060	7.109	25-Sep-18	3.900	52.880
					02-Dec-22	2.602	53.458
					19-Oct-23	4.503	51.557
					27-May-24	4.202	51.858
					22-Aug-24	3.245	52.815
BW2a	291911	6247442	56.290	7.723	25-Sep-18	4.090	52.850
					02-Dec-22	2.795	53.495
					19-Oct-23	6.077	50.283
					28-May-24	3.516	52.774
					22-Aug-24	2.760	53.530
BW2b	291914	6247440	56.400	33.017	25-Sep-18	5.380	51.690
					02-Dec-22	4.161	52.239
					19-Oct-23	3.666	52.734
					28-May-24	1.905	54.495
					22-Aug-24	2.599	53.801
BW4a	293602	6247294	49.040	6.585	25-Sep-18	3.140	46.610
					02-Dec-22	1.635	47.405
					18-Oct-23	3.041	45.999
					28-May-24	2.301	46.739
					22-Aug-24	1.517	47.523
BW4b	293602	6247295	49.060	32.975	25-Sep-18	2.510	47.330
					02-Dec-22	1.660	47.400
					18-Oct-23	1.985	47.075
					28-May-24	1.986	47.074
					22-Aug-24	1.503	47.557
BW5a	293098	6246559	45.560	8.041	25-Sep-18	4.350	42.920
					02-Dec-22	4.989	40.571
					18-Oct-23	5.673	39.887
					28-May-24	4.618	40.942
					22-Aug-24	3.227	42.333
BW5b	293098	6246561	46.510	32.875	25-Sep-18	2.940	44.270
					02-Dec-22	4.432	42.078
					18-Oct-23	5.408	41.102
					28-May-24	3.668	42.842
					22-Aug-24	4.555	41.955
MW1	292250	6246990	63.990	28.901	25-Sep-18	13.780	50.990
					02-Dec-22	12.629	51.361
					19-Oct-23	12.808	51.182
					28-May-24	13.516	50.474
					22-Aug-24	13.639	50.351
MW4	291750	6247169	56.430	24.100	25-Sep-18	5.780	50.920
					02-Dec-22	4.859	51.571
					19-Oct-23	5.932	50.498
					27-May-24	7.936	48.494
					22-Aug-24	6.575	49.855

SWL = standing water level

mBTC = metres below top of casing

mAHD = metres Australian height datum

Monitoring Well ID	Date	Depth to SWL (mbTOC)	Depth to bottom (mBTOC)	Top of Casing Elevation (mAHD)	Corrected Water Level (mAHD)	Screened interval (mBTOC)	Deep / Shallow Well	Comments
MW1	22/08/2024	13.639	28.901	63.99	50.35	25-31	Deep	-
MW4	22/08/2024	6.575	24.100	56.43	49.86	22-28	Deep	-
BW1	22/08/2024	3.245	7.109	56.06	52.82	5-8	Shallow	-
BW2A	22/08/2024	2.760	7.723	56.29	53.69	5-8	Shallow	-
BW2B	22/08/2024	2.599	33.017	56.4	53.64	27-33	Deep	-
BW4A	22/08/2024	1.517	6.585	49.04	47.52	3-6	Shallow	-
BW4B	22/08/2024	1.503	32.975	49.06	47.56	27-33	Deep	-
BW5A	22/08/2024	3.227	8.041	45.56	41.01	4-7	Shallow	-
BW5B	22/08/2024	4.555	32.875	46.51	43.28	27-33	Deep	-

SWL = standing water level
 mBTOC = metres below top of casing
 mAHD = metres Australian height datum

					Laboratory Parameters		Alkalinity				Cations and Anions								Metals															
					pH, Lab	Dissolved Solids - Total	Alkalinity - Total as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Calcium	Magnesium	Sodium	Potassium	Ionic Balance	Sulphate as SO4 2-	Chloride	Total Cations	Total Anions	Aluminium - Dissolved	Arsenic - Dissolved	Boron - Dissolved	Cadmium - Dissolved	Chromium - Dissolved	Copper - Dissolved	Iron - Dissolved	Lead - Dissolved	Manganese - Dissolved	Molybdenum - Dissolved	Nickel - Dissolved	Selenium - Dissolved	Silver - Dissolved	Zinc - Dissolved	
LOR					0.01	10	1	1	1	1	1	1	1	1	0.01	1	1	0.01	0.01	0.01	0.001	0.05	0.0001	0.001	0.001	0.001	0.05	0.001	0.001	0.001	0.001	0.01	0.001	0.005
Units					pH units	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	%	mg/L	mg/L	MEQ/L	MEQ/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Action Levels																					0.013	0.94	0.0002	0.001	0.0014		0.0034	1.9	0.034	0.011	0.005	5e-005	0.008	
ANZG 2018 SLIGHT-MOD DIST - FRESH 95/99 ¹																					0.013	0.94	0.0002	0.001	0.0014		0.0034	1.9	0.034	0.011	0.005	5e-005	0.008	
RECREATIONAL WATER - HEALTH ²																5000					2	0.1	40	0.02	0.5	20		0.1	5	0.5	0.2	0.1	1	
RECREATIONAL WATER - AESTHETIC ³					8.5	600000							1800			2500	2500				2					10	3		1					30
Sample Location	Date Sampled	Sample ID	Depth Range (m)	Sample Type																														
BW1	22/08/2024	BW1 240822		N	6.64	12100000	191	191	< 1	< 1	32	621	3130	3	4.13	758	6580	189	205	< 0.01	< 0.001	< 0.05	< 0.0001	< 0.001	< 0.001	6.06	< 0.001	1.39	< 0.001	0.008	< 0.01	< 0.001	0.009	
BW2A	22/08/2024	BW2A 240822		N	7.25	1340000	311	311	< 1	< 1	59	69	324	24	3.39	96	594	23.3	25.0	< 0.01	0.002	< 0.05 J	< 0.0001	< 0.001	< 0.001	0.26	< 0.001	0.151	0.001	0.005	< 0.01	< 0.001	< 0.005	
BW2B	22/08/2024	BW2B 240822		N	7.51	1650000	337	337	< 1	< 1	64	67	393	20	7.06	142	731	26.3	30.3	< 0.01	0.001	< 0.05 J	< 0.0001	< 0.001	0.018	< 0.05	< 0.001	0.022	0.001	0.003	< 0.01	< 0.001	0.110	
BW4A	22/08/2024	BW4A 240822		N	7.41	9650000	470	470	< 1	< 1	166	291	2620	8	6.86	164	5500	146	168	< 0.01	< 0.001	0.05	< 0.0001	< 0.001	0.340	< 0.05	< 0.001	0.376	0.009	0.008	< 0.01	< 0.001	0.008	
BW4B	22/08/2024	BW4B 240822		N	7.17	14500000	639	639	< 1	< 1	713	352	3800	72	0.30	< 1	7810	232	233	< 0.01	< 0.001	< 0.05 J	< 0.0001	< 0.001	< 0.001	8.34	< 0.001	0.110	< 0.001	0.001	< 0.01	< 0.001	0.078	
BW5A	22/08/2024	BW5A 240822		N	7.39	17300000	916	916	< 1	< 1	413	645	4450	31	2.58	294	9140	268	282	< 0.01	< 0.001	< 0.05 J	< 0.0001	< 0.001	< 0.001	0.95	< 0.001	0.600	< 0.001	0.002	< 0.01	< 0.001	< 0.005	
BW5B	22/08/2024	BW5B 240822		N	7.62	9800000	755	755	< 1	< 1	360	230	2760	49	3.08	< 1	5430	158	168	< 0.01	< 0.001	< 0.05 J	< 0.0001	< 0.001	< 0.001	1.32	< 0.001	0.123	< 0.001	< 0.001	< 0.01	< 0.001	0.040	
MW1	22/08/2024	MW1 240822		N	7.51	7890000	936	936	< 1	< 1	144	373	2060	28	2.96	826	3550	128	136	< 0.01	< 0.001	0.10	< 0.0001	< 0.001	< 0.001	1.33	< 0.001	0.549	0.001	0.002	< 0.01	< 0.001	< 0.005	
	22/08/2024	D01 240822		FD	7.60	7990000	941	941	< 1	< 1	145	388	2150	28	1.31	824	3580	133	137	< 0.01	< 0.001	0.10	< 0.0001	< 0.001	< 0.001	0.71	< 0.001	0.529	0.002	0.002	< 0.01	< 0.001	< 0.005	
MW4	22/08/2024	MW4 240822		N	7.49	15700000	746	746	< 1	< 1	252	813	3860	19	3.10	1180	7950	248	264	< 0.01	0.003	< 0.05 J	< 0.0001	< 0.001	< 0.001	0.83	< 0.001	0.126	< 0.001	0.002	< 0.01	< 0.001	0.006	

Legend:
- Not analysed / not calculated
LOR – Limit of Recording
* LOR Exceeds Guideline Trigger Value
Sample Type: N - Primary, FD - Duplicate, FT - Triplicate
% = percent
deg C = degrees Celsius
MEQ/L =
mg/L = milligrams per liter
mV = millivolts
pH units = pH units
ug/L = micrograms per liter
ug/L = milligrams per liter
uS/cm = microSiemens per centimeter

Action Levels:
¹ANZG 2018, Toxicant default guideline values for water quality in aquatic ecosystems, Slightly to moderately disturbed ecosystems - Freshwater. Applied 95% DGV, and alternate LOSP where recommended
²Consolidated recreational water guidelines based on NHMRC (2008) Guidelines for Managing Risks in Recreational Water and derived by applying a multiplication factor of 10 to Australian Drinking Water Guidelines (ADWG V3.8). Where guidelines are not available for an analyte, alternate sources have been adopted as recommended in Section 6.5 of NHMRC (2011). NHMRC (2019) values have been adopted for PFAS.
³NHMRC (2008) Guidelines for Managing Risks in Recreational Water, Aesthetic. Derived by applying a multiplication factor of 10 to NHMRC (2011) ADWG, Aesthetic
Exceeds two or more action levels - see superscripts for specific action levels

Lab Qualifiers:
J - The analyte was positively identified; associated numerical value is the approximate concentration of the analyte in the sample.

Well ID	Date Sampled	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Comments
MW1	22/08/2024	6.76	20.5	11716	1.46	25.80	Moderate turbidity, beige-brown, no odour, no sheen, brown-grey suspended sediments.
MW4	22/08/2024	6.80	20.8	22209	0.56	-3.00	Low turbidity, clear, no odour, no sheen, black suspended sediments.
BW1	22/08/2024	6.28	19.1	18837	0.74	-144.50	Low turbidity, clear, no odour, no sheen, black suspended sediments.
BW2A	22/08/2024	7.39	21.3	2771	3.33	27.00	Low to moderate turbidity, brown, decomposing organic odour, brown suspended sediments.
BW2B	22/08/2024	6.96	21.7	1808	1.61	-40.40	Low turbidity, clear, no odour, black-grey suspended sediments.
BW4A	22/08/2024	7.09	18.3	13745	1.69	110.80	High turbidity, orange, no odour, orange-brown suspended sediments.
BW4B	22/08/2024	6.53	19.2	18330	0.95	7.50	Moderate to high turbidity, brown-grey, hydrogen sulfide odour, brown-grey-orange suspended sediments.
BW5A	22/08/2024	7.06	19.7	15913	0.28	-69.20	Low turbidity, clear, no odour, grey suspended sediments.
BW5B	22/08/2024	6.59	20.4	25653	0.88	19.50	High turbidity, brown, no odour, brown-grey suspended sediments.

mS = millisiemens

cm = centimetres

mg = milligram

L = Litre

mV = millivolts

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DATE
28 November 2024

SUBJECT
CSR - Badgerys Creek
Annual Groundwater Monitoring
Report – November 2024

REFERENCE
0606483_S011501

Subject: Badgerys Creek Advanced Manufacturing Hub – Annual Groundwater
Monitoring Report –2024

Reference: 0606483_S011501

1. INTRODUCTION

1.1 GENERAL

ERM Services Australia Pty Ltd (ERM) were engaged by CSR limited to perform an annual report summarising quarterly groundwater monitoring events (GME) at the CSR Advanced Manufacturing Hub, located at 235 Martin Street, Badgerys Creek, NSW 2555 ('the Site'). The Site lies within the Liverpool Local Government Area (LGA), approximately 15 km southeast of Penrith and 20 km north of Campbelltown.

In accordance with Schedule 3 Condition 23 of the project approval, the DPIE requires that CSR develop and implement a Soil and Water Management Plan (SWMP) for the Site, including both a Site Water Balance and a Surface Water Management Plan. The SWMP is designed to operate as a dynamic document for the duration of quarrying activities occurring on-site, to be updated as necessary when site conditions change.

The Site location is shown in **Figure 1** – Site Location.

This Annual Groundwater Monitoring Report presents the results of three (May, August and November 2024) groundwater monitoring events (GME) as per the requirements for groundwater management within the current approved SWMP.

1.2 REPORTING REQUIREMENTS

The monitoring in this report encompasses the quarterly reporting requirements of the SWMP and are outlined below:

- Groundwater quality monitoring;

- Locations: BW1, BW2a, BW2b, BW4a, BW4b, BW5a, BW5b, MW1, and MW4.
- Groundwater gauging and sampling: Data collection to consist of standing water level (SWL), field quality parameters, analytical laboratory analysis as per the SWMP;
 - The SWL will be taken from automatic loggers installed in wells BW2a, BW4a, BW4b, and MW1; and
 - The SWL will be taken quarterly from the remaining monitoring wells.

1.3 OBJECTIVES

The objectives of this groundwater monitoring annual report summary are to present data gathered over the past three GME's, in accordance with the requirements of the approved groundwater monitoring management plan (the SWMP) for the Site and to allow for CSR's required annual findings to report to Water NSW/NRAR.

1.4 SCOPE OF WORKS

ERM undertook the following activities to achieve the project objectives from the three monitoring events; May, August and November 2024:

- Project preliminaries including the preparation of a site-specific Health and Safety Plan (HaSP) and Job Hazard Analysis (JHA) documents for relevant site activities;
- Gauging, sampling and collection of water quality and physiochemical parameters from 9 on-site groundwater monitoring wells; plus additional Quality Assurance Quality Control (QAQC);
- Submission of collected groundwater samples to a NATA accredited laboratory for analysis; and
- Preparation of this Annual Groundwater Monitoring report summarising the data collected from the May, August and November 2024 GME's.

2. MONITORING METHODOLOGY

2.1 GENERAL

Three quarterly groundwater monitoring events were conducted over the following periods:

- May 2024: 27th and 28th of May;
- August 2024: 22nd August; and
- November 2024: 7th November.

Note, a monitoring round in February was not completed due to project oversight.

2.2 GROUNDWATER MONITORING NETWORK

The groundwater monitoring network consists of 14 recorded groundwater wells installed across the Site. Refer to **Figure 2** – Site Layout, for the locations of groundwater monitoring wells.

Among these 14 wells are three sets of paired wells:

- BW2a & BW2b;
- BW4a and BW4b; and
- BW5a & BW5b.

The paired wells were installed to facilitate monitoring of both the deeper shale and shallow alluvial aquifers and provide information on hydraulic conductivity and connectivity between the shallow and deeper horizons.

It is noted that some wells are reported lost / destroyed from previous reports, observations and the recent GMEs and were not recorded during any of the 2024 quarterly GMEs. The following lost / destroyed monitoring wells are outlined below:

- MW2 is an existing monitoring bore previously recorded with damage to the surface casing and PVC standpipe sufficient to prevent its inclusion in ongoing monitoring works. As such MW2 was not sampled during any monitoring round this year;
- Previous reports indicate that wells MW3a, MW3b and MW3c were installed within the immediate vicinity of the former brick making factory as part of a previous contamination investigation. These wells were not used as part of the routine groundwater monitoring works for the SWMP but were previously proposed as a suitable addition for future groundwater monitoring events. However, following demolition of the former factory these wells no longer appear to be present on site and as such were not sampled during the 2024 works; and
- MW6 is recorded as an older monitoring bore located in the south-west of the Site for which installation details are not available. This well was not located during any 2024 monitoring works. It has been reported as lost, with no current plans to reinstate the well.

2.3 METHODOLOGY

- Groundwater Monitoring wells were sampled using hydra sleeves, which were pre-deployed more than 24 hours prior to sampling.
- Standing water level was measured at each well prior to sampling using a calibrated oil/water interface probe and field parameters were recorded using a calibrated YSI water quality meter, refer to **Attachment E**.
- Water samples were collected into laboratory-supplied containers and placed into a chilled, insulated container to be transported to the laboratory. Intra- and inter-laboratory duplicate samples were collected.
- Water levels were retrieved from logger data via In-situ RuggedTROLLs installed in monitoring four groundwater monitoring wells.

The laboratory analysis was requested as per the SWMP and was as follows:

- pH, Electrical conductivity and Total dissolved solids;
- Alkalinity;
- Major Anions (sulphate, chloride);
- Major Cations (calcium, magnesium, sodium, potassium);
- Dissolved heavy metals (aluminium, arsenic, boron, cadmium, chromium, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, zinc);
- Benzene, toluene, ethyl benzene, xylene, naphthalene (BTEXN); and
- Total recoverable hydrocarbons (TRH);
- Ionic balance (Total anions, Total cations, Ionic balance)

Table 4.1 Below shows the available installation details for the monitoring well network.

Figure 1 – Site Layout and Sample Locations





TABLE 4.1 – GROUNDWATER WELL INSTALLATION DETAILS

Well ID	Easting	Northing	Location Description	Depth Installed (m)	Screen Interval (m)	Surface Elevation (mAHD)	SWL (mbTOC) *	SWL (mAHD)*
MW1	292250	6246990	Deep well located adjacent to Pit 1 approximately 60m to the south-east.	31	25 – 31	63.99	13.78	50.99
MW4	291750	6247169	Deep well adjacent to Pit 1 on the northern side, approximately 30m from the batters and 60m from the stored water in the pit.	28	22 – 28	56.43	5.78	50.92
MW6	291872	6246790	South of Pit 1, not located since Nov 2022.	33	Unknown	Unknown	Unknown	Unknown
BW1	291741	6247174	Shallow well adjacent to Pit 1 on the northern side, approximately 30m from the batters and 60m from the stored water in the pit.	8	5 – 8	56.06	3.90	52.88
BW2a	291911	6247442	Shallow well adjacent to Badgerys Creek tributary in the north-west of site (set back to protect an Aboriginal heritage site identified for protection).	8	5 – 8	56.29	4.09	52.85
BW2b	291914	6247440	Deep well adjacent to Badgerys Creek tributary in the north-west of site (set back to protect an Aboriginal heritage site identified for protection).	33	27 – 33	56.40	5.38	51.69
BW4a	293602	6247294	Shallow well adjacent to South creek in the north-east of site.	6	3 – 6	49.04	3.14	46.61
BW4b	293602	6247295	Deep well adjacent to South creek in the north-east of site.	33	27 – 33	49.06	2.51	47.33
BW5a	293098	6246559	Shallow well adjacent to South creek in the South-east of site.	7	4 – 7	45.56	4.35	42.92
BW5b	293098	6246561	Deep well adjacent to South creek in the South-east of site.	33	27 – 33	46.51	2.94	44.27

*Data as of 25/09/2018

3. ASSESSMENT CRITERIA

Individual groundwater data were compared to the relevant assessment criteria. The following assessment criteria were adopted for each GME:

- Australian and New Zealand Guidelines, 2018 for fresh and marine water quality (ANZG, 2018); and
- Fresh water criteria were adopted on the basis that the site borders Badgerys Creek to the east.

4. GROUNDWATER RESULTS

4.1 WATER LEVEL ASSESSMENT

Water level comparisons have been made against the tabulated data provided in the Groundwater Monitoring Report produced for the Site in May 2021 (Groundwater Exploration Services 2021) (GES) and the November 2024 GME completed by ERM. The Table is presented in Table 1, Attachment B – Historical Water Level Data.

Groundwater levels decreased in wells BW1, BW5a, BW5b, MW1 and MW4 between 0.196m (BW5a) and 3.255m (MW4) with the most significant decrease observed in MW4.

The significant decrease in groundwater levels is likely a result of recent dry weather and low rainfall recorded for the area.

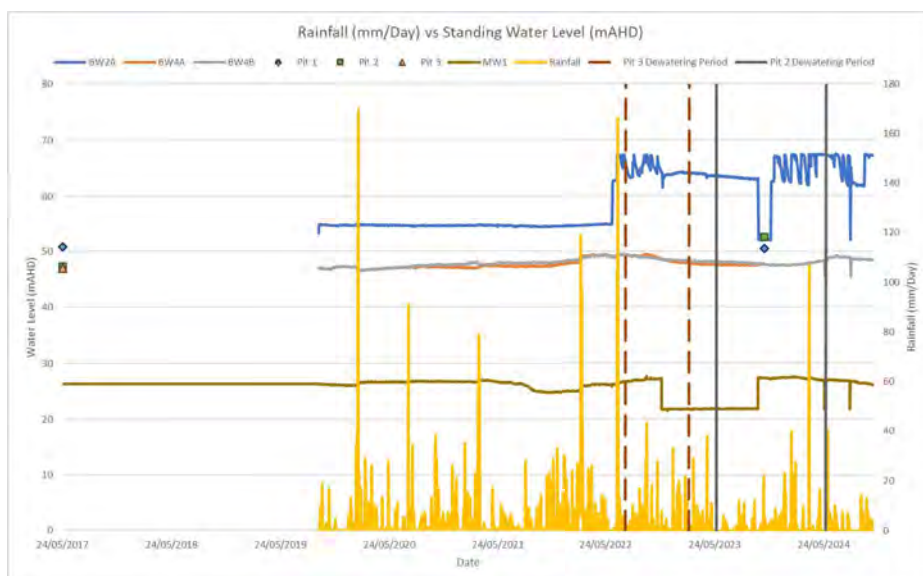
Groundwater levels increased in wells BW2a, BW2b, BW4a, BW4b, between 4.453m (BW2b) and 0.875m (BW4b).

ERM retrieved water level logger data via In-situ RuggedTROLLs installed in monitoring wells BW2a, BW4a and BW4b between September 2018 and November 2024. The logger cap for BW4B was reported missing and no data is available from August 2024 and onwards. The logger cap will need replacement in 2025 monitoring events.

Water Level data vs Rainfall between 2019 to 2024 is presented on the below graph. Pit 1, 2 and 3 water levels are also presented on the graph. Pit 1 remains full, with Pit 3 dewatering occurring between August 2022 and March 2023. Pit 2 was dewatered from around June 2023 up to June 2024.

BW2a appears to have the most significant variability in groundwater levels during the Pit 3 dewatering period, going from 2.795 mbtoc in December 2022 to 6.077 mbtoc in October 2023 after the start of the dewatering period. However, it is unlikely that the dewatering is impacting these groundwater levels due to the distance between the locations (~1km).

BW4a also shows variability in groundwater levels during the Pit 3 dewatering period, going from 1.635 mbtoc in December 2022 to 3.041 mbtoc October 2023. Groundwater levels did not appear to correlate with the Pit 2 and 3 dewatering.



There is a significant increase in water level within BW2a and BW4b are observed between May and November 2024. There was a notable decrease in water level within MW1 between November 2022 to October 2023, which recovered late October 2023 and has remained generally stable and reflective of historical water levels since then.

Rainfall data has been supplied from the Erskine Park Weather Station (67066) covering the period between September 2019 to December 2023, and the Badgerys Creek Weather Station (067108) covering the period between January 2024 to November 2024.

Groundwater gauging data for November 2024 is presented in **Table 6.2** below and in **Table 2** in **Attachment B**.

TABLE 6.1 GROUNDWATER GAUGING

Well ID	Date	SWL (mbtoc)	Depth to Bottom (mbtoc)	SWL (mAHD)
MW1	7/11/2024	15.292	29.09	48.7
MW4	7/11/2024	9.035	24.24	47.4
BW1	7/11/2024	6.939	7.135	49.67
BW2a	7/11/2024	2.756	7.734	55.36
BW2b	7/11/2024	0.927	33.880	53.64
BW4a	7/11/2024	2.265	6.568	46.78
BW4b	7/11/2024	0.735	33.320	48.33
BW5a	7/11/2024	4.546	8.019	41.01
BW5b	7/11/2024	3.265	*16.735	43.25

*Gauging results from BW5b indicated a blockage within the well as depth to the bottom is 33 mbtoc. ERM will assess the potential cause of the blockage during the next monitoring round in February 2025.

4.2 ANALYTICAL RESULTS

Groundwater monitoring events were conducted in May, August and November 2024.

For each event, water samples were collected for field analysis of pH, electrical conductivity (EC), and for laboratory testing of the following comprehensive suite of analytes as per the SWMP:

- pH, EC and total dissolved solids (TDS);
- Major cations and anions;
- Dissolved heavy metals (Aluminium, Arsenic, Boron, Cadmium, Chromium, Copper, Iron, Lead, Manganese, Molybdenum, Nickel, Selenium, Silver, Zinc);
- Benzene, toluene, ethyl benzene, xylene, naphthalene (BTEXN);
- Total recoverable hydrocarbons (TRH); and
- Ionic balance (Total anions, Total cations, Ionic balance).

Laboratory analysis was undertaken by ALS Environmental and Eurofins Environment Testing Australia Pty Ltd, both NATA-accredited laboratories based in Sydney. The ANZG (2018) Guidelines for slightly to moderately disturbed ecosystems (freshwater) have been applied to groundwater results.

Analytical laboratory and field results from May, August and November groundwater monitoring events from 2024 of the groundwater monitoring network are summarised in **Attachment B (Tables 3 and 4 respectively)**.

4.3 GME MAY 2024

Two exceedances of the site criteria were reported within groundwater wells for the following analytes during the May 2024 groundwater monitoring event:

- Copper concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.0014 mg/L) at all groundwater locations except in MW4.
- Selenium concentrations were reported below the laboratory LOR in all groundwater samples analysed, however the laboratory LOR (0.001 mg/L) exceeded the adopted ANZG 95% freshwater criteria (0.00005 mg/L).

4.4 GME AUGUST 2024

Three exceedances of the site criteria were reported within groundwater wells for the following analytes during the August 2024 groundwater monitoring event:

- Copper concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.0014 mg/L) at BW2B (0.018 mg/L) and BW4A (0.340 mg/L).
- Selenium and Silver concentrations were reported below the laboratory LOR (in all groundwater samples analysed, however the laboratory LOR (0.001 mg/L) exceeded the adopted ANZG 95% freshwater criteria (0.005, and 0.00005 mg/L respectively).
- Zinc concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.008 mg/L) at BW1 (0.009 mg/L), BW2B (0.110 mg/L) and BW4B (0.078 mg/L) and BW5B (0.040 mg/L).

4.5 GME NOVEMBER 2024

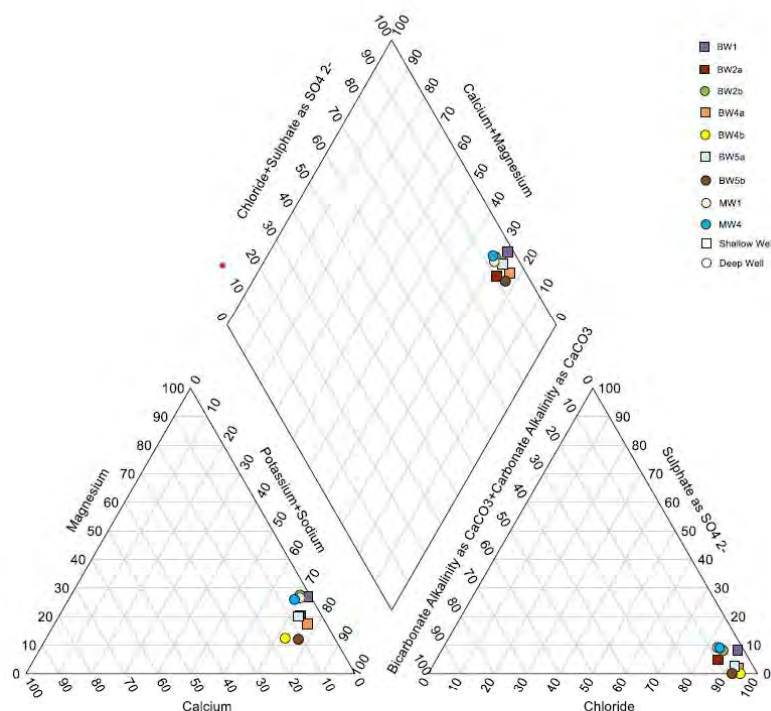
Two exceedances of the site criteria were reported within groundwater wells for the following analytes during the November 2024 groundwater monitoring event:

- Copper concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.0014 mg/L) at BW2B 0.008 mg/L, BW4A (0.039 mg/L) and BW5A (0.004 mg/L).
- Selenium concentrations were reported below the laboratory LOR (0.01 mg/L) for the triplicate (T01_241107) taken at MW1, however the laboratory LOR exceeded the adopted ANZG 95% freshwater criteria (0.00005 mg/L).
- Zinc concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.008 mg/L) at BW1(0.15 mg/L), BW2B (0.044 mg/L), BW4A (0.009 mg/L), BW4B (0.023 mg/L), and BW5B (0.015 mg/L).
- Ammonia concentrations exceeded the ANZG 95% protection levels for freshwater criteria (0.9 mg/L) at BW4B (11 mg/L), BW5B (7.6 mg/L) and MW4 (1.6 mg/L).

The reported exceedances are low and are likely representative of regional background concentrations for the Badgery's Creek area. The results are consistent with the previous analytical results reported in the October 2023 GME.

EC results and Piper diagram plots have been used to demonstrate the Site hydrogeological conditions. Differences in salinity between strata tend to reflect recharge rates or connectivity with surface waters. Areas of higher salinity tend to reflect lower recharge rates, while lower salinity may reflect greater recharge / surface water connectivity. Piper plots can be used to assess recharge and discharge processes and allow comparison of water samples derived from different environments within the hydrological cycle. Recently recharged water tends to plot to the left apex of the diamond field in the Piper diagram, waters further from the source of recharge will plot to the right.

The composite Piper plot, compiling October 2023 and May, August and November 2024 events, is presented below of the groundwater samples from the project area. The individual points within the Piper plot below (**Attachment D**) are a calculated average of analytical results from the sampled wells across the four monitoring events. The statistical summary table (**Table 5, Attachment B**), presents statistical data supporting the piper plot below.



Review of the above plot shows most samples grouped close to the right-hand side of both Cations and Anions trilinear diagram, indicative of saline groundwater high in sodium chloride. There is generally little difference apparent between the shallow and deeper groundwater monitoring locations. MW4 and MW1 has been plotted as per the general plot tendency, which differentiate to the results from previous monitoring events (October 2023) with MW1 and MW4 being slightly left in the piper plot and trilinear anion diagram. The Sen-slope analysis as presented in **Table 5, Attachment B**, suggests there is a notable increase in Chloride, but not a statistically significant trend from May to November 2024 at MW4 as indicated by the Mann-Kendall analysis. However, the Mann-Kendall analysis does indicate a statistically significant trend (negative) of bicarbonate Alkalinity as CaCO_3 and Potassium in MW1.

Overall, no statistically significant trends (positive or negative) have been identified by the Mann-Kendall Analysis presented in **Table 5, Attachment B** for Cation and Anion analyte concentrations in groundwater wells between October 2023 to November 2024, with the exception of those below, demonstrating a statistically negative trend:

- MW1 - Bicarbonate Alkalinity as CaCO_3 , Potassium
- BW1 – Potassium
- BW5A – Sodium
- BW5B – Chloride, Sodium

4.6 GROUNDWATER FIELD GEOCHEMISTRY

4.7 ELECTRICAL CONDUCTIVITY

Groundwater salinity across the site monitoring network shows variability in electrical conductivity (EC) results. Field physiochemical parameters are presented in **Table 4, Attachment B**.

- May 2021 GME (GES 2021): 8,760 (BW2b) to 31,600 $\mu\text{S}/\text{cm}$.
- December 2022 GME (ERM 2022): 1,331 (BW2b) to 26,965 (BW5a) $\mu\text{S}/\text{cm}$.
- October 2023 GME: 2,935 (MW4) to 23,000 (BW5a) $\mu\text{S}/\text{cm}$.
- May 2024 GME: 3,350 (BW2a) to 23,960 (MW4) $\mu\text{S}/\text{cm}$.
- August 2024 GME: 1,808 (BW2B) to 25,653 (BW5a) $\mu\text{S}/\text{cm}$.
- November 2024 GME: 2,316 (BW2a) to 26,065 (BW5a) $\mu\text{S}/\text{cm}$.

5. BENEFICIAL USE

The National and State guidelines for groundwater protection rely on a framework in which there is the identification of existing or potential beneficial uses for groundwater resources. The choice of a beneficial use classification depends upon the quality of water present and the potential values of the water in the long term (NWQMS, 1995).

The NWQM Strategy Guidelines for Groundwater Protection in Australia (1995) recommended the following beneficial uses that have been adopted in this policy. They include:

- Ecosystem protection;
- Recreation and aesthetics;
- Raw water for drinking water supply;
- Agricultural water; and
- Industrial water

Site groundwater quality has historically exceeded relevant guideline values. ANZECC & ARMCANZ (2000) (since updated by the ANZG 2018) derive default guideline values for large geographic regions encompassing a broad range of catchments and water types. These guideline values include different levels of protection, depending on the current or desired ecosystem condition. This assessment has applied both recreational and aquatic species protection (95%).

Furthermore, given the historical land use at the Site for agricultural and quarrying purposes, it can be considered a highly disturbed system under the ANZG (2018) guidelines. Considered along with the elevated site salinity typical for this shale unit, the exceedances of the default guideline trigger values may not necessarily be reflective of issues with performance of operational water quality management, nor do they indicate that water quality deterioration has occurred as a result of the Project.

As stated in the May 2021 Groundwater Monitoring Report (GES 2021). The NWQM Strategy Guidelines recommends less conservative site-specific guideline values be derived for management plans using 90th or 10th percentiles of minimally impacted reference-site data, with the goal of continual improvement. The groundwater

management plan is to adopt such a strategy to maintain or improve the current use status moving forward, however, as minimal historic data for analytical groundwater and surface water results were available for this reporting period this will be presented in the next groundwater monitoring report.

6. SUMMARY

6.1 GROUNDWATER LEVELS

Groundwater levels across the site generally reflect site topography. Paired monitoring locations and water levels at these sites are within a narrow range but show enough difference to establish there is a poor connection within the shale geological unit (Wianamatta Shale).

The results from this November 2024 GME are generally consistent with the previous results in the ERM 2022 and 2023 GME for the site.

The recent on-site dewatering activities of Pit 2 do not appear to have an impact on groundwater elevation in MW1, MW4a and MW4b, however the available data loggers were installed in locations approximately 1km north and north-east east of Pit 2. ERM recommend a data logger cap be replaced in BW4B , as well as increased water level reporting of quarry pits, should future hydrogeological assessment of dewatering impacts on the remaining quarry pits be required.

6.2 GROUNDWATER QUALITY

Water quality data for pH and EC shows groundwater quality is brackish to saline, typical of Wianamatta Shale with the exception of BW2a and BW2b with lower EC values reported. The physiochemical parameters are generally consistent with the previous monitoring event results.

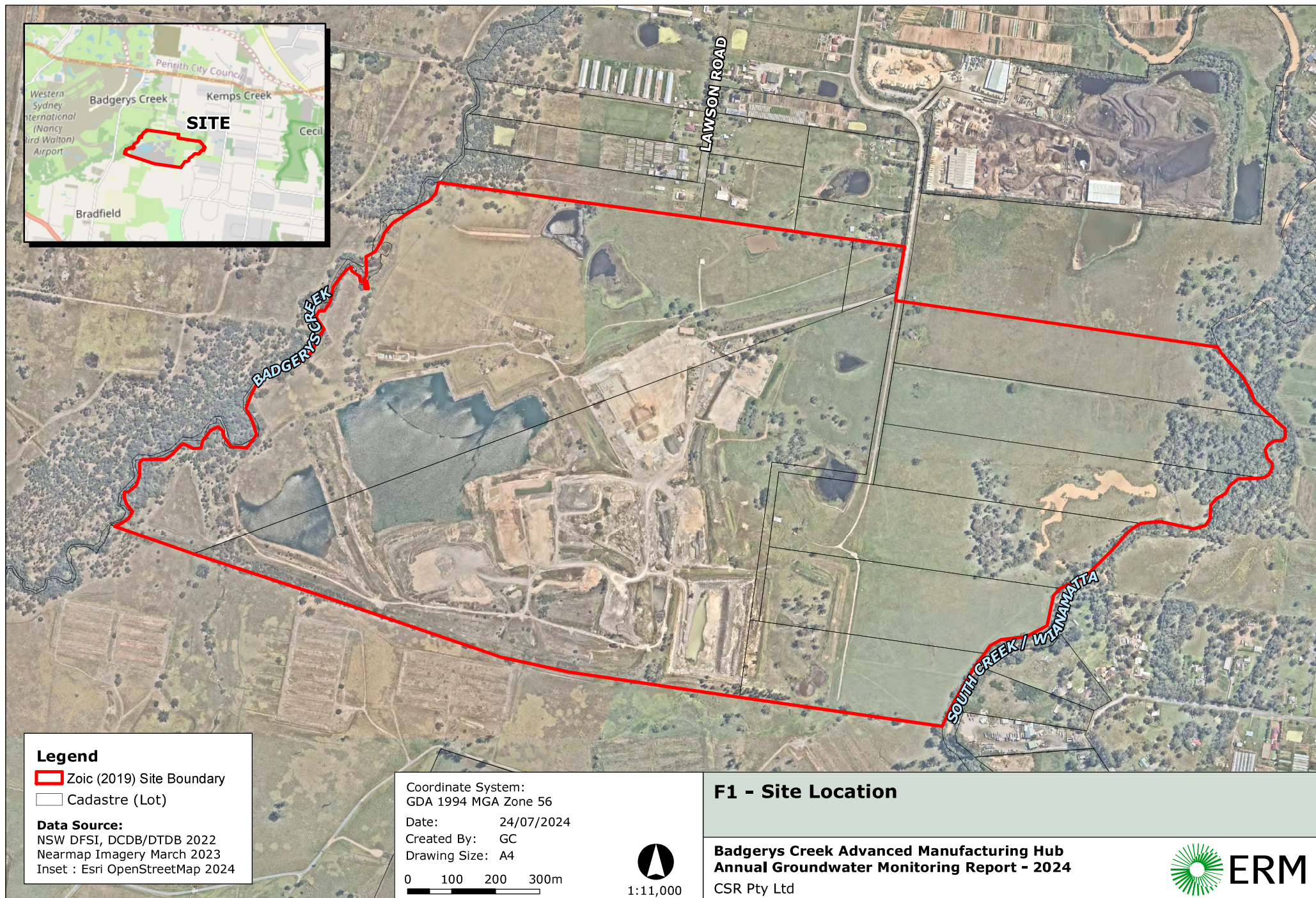
Yours sincerely,

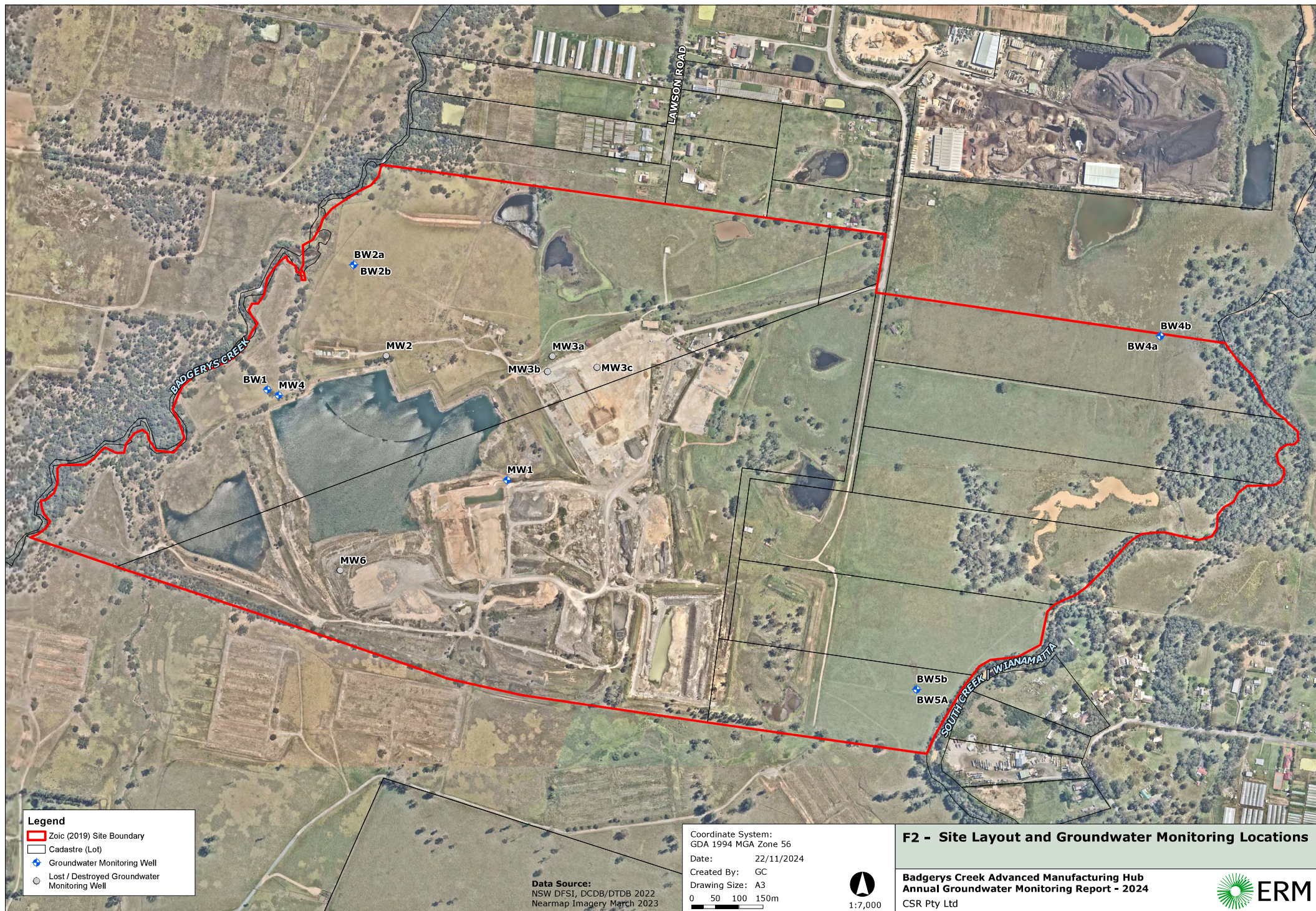


Russell Jarman
Principal Environmental Consultant



ATTACHMENT A FIGURES







ATTACHMENT B DATA SUMMARY TABLES

Well ID	Easting	Northing	Surface Elevation (mAHD)	Depth to Bottom (mBTC)	Date	SWL (mbtoc)	SWL (mAHD)
BW1	291741	6247174	56.060	7.109	25-Sep-18	3.900	52.880
					02-Dec-22	2.602	53.458
					19-Oct-23	4.503	51.557
					27-May-24	4.202	51.858
					22-Aug-24	3.245	52.815
					07-Nov-24	6.393	49.667
BW2a	291911	6247442	56.290	7.723	25-Sep-18	4.090	52.850
					02-Dec-22	2.795	53.495
					19-Oct-23	6.077	50.283
					28-May-24	3.516	52.774
					22-Aug-24	2.760	53.530
					07-Nov-24	2.756	53.534
BW2b	291914	6247440	56.400	33.017	25-Sep-18	5.380	51.690
					02-Dec-22	4.161	52.239
					19-Oct-23	3.666	52.734
					28-May-24	1.905	54.495
					22-Aug-24	2.599	53.801
					07-Nov-24	0.927	55.473
BW4a	293602	6247294	49.040	6.585	25-Sep-18	3.140	46.610
					02-Dec-22	1.635	47.405
					18-Oct-23	3.041	45.999
					28-May-24	2.301	46.739
					22-Aug-24	1.517	47.523
					07-Nov-24	2.265	46.775
BW4b	293602	6247295	49.060	32.975	25-Sep-18	2.510	47.330
					02-Dec-22	1.660	47.400
					18-Oct-23	1.985	47.075
					28-May-24	1.986	47.074
					22-Aug-24	1.503	47.557
					07-Nov-24	0.735	48.325
BW5a	293098	6246559	45.560	8.041	25-Sep-18	4.350	42.920
					02-Dec-22	4.989	40.571
					18-Oct-23	5.673	39.887
					28-May-24	4.618	40.942
					22-Aug-24	3.227	42.333
					07-Nov-24	4.546	41.014
BW5b	293098	6246561	46.510	32.875	25-Sep-18	2.940	44.270
					02-Dec-22	4.432	42.078
					18-Oct-23	5.408	41.102
					28-May-24	3.668	42.842
					22-Aug-24	4.555	41.955
					07-Nov-24	3.265	43.245
MW1	292250	6246990	63.990	28.901	25-Sep-18	13.780	50.990
					02-Dec-22	12.629	51.361
					19-Oct-23	12.808	51.182
					28-May-24	13.516	50.474
					22-Aug-24	13.639	50.351
					07-Nov-24	15.292	48.698
MW4	291750	6247169	56.430	24.100	25-Sep-18	5.780	50.920
					02-Dec-22	4.859	51.571
					19-Oct-23	5.932	50.498
					27-May-24	7.936	48.494
					22-Aug-24	6.575	49.855
					07-Nov-24	9.035	47.395

SWL = standing water level
mBTC = metres below top of casing
mAHD = metres Australian height datum

Monitoring Well ID	Date	Depth to SWL (mBTC)	Depth to bottom (mBTC)	Top of Casing Elevation (mAHD)	Corrected Water Level (mAHD)	Screened interval (mBTC)	Deep / Shallow Well	Comments
MW1	28/05/2024	13.516	--	63.99	50.47	25-31	Deep	-
MW1	22/08/2024	13.639	28.901	63.99	50.35	25-31	Deep	-
MW1	7/11/2024	15.292	29.09	63.99	48.70	25-31	Deep	-
MW4	28/05/2024	7.936	23.679	56.43	48.49	22-28	Deep	-
MW4	22/08/2024	6.575	24.100	56.43	49.86	22-28	Deep	-
MW4	7/11/2024	9.035	24.24	56.43	47.40	22-28	Deep	-
BW1	28/05/2024	4.202	7.907	56.06	51.86	5-8	Shallow	-
BW1	22/08/2024	3.245	7.109	56.06	52.82	5-8	Shallow	-
BW1	7/11/2024	6.393	7.135	56.06	49.67	5-8	Shallow	-
BW2A	28/05/2024	3.516	7.725	56.29	54.39	5-8	Shallow	-
BW2A	22/08/2024	2.760	7.723	56.29	53.69	5-8	Shallow	-
BW2A	7/11/2024	2.756	7.734	56.29	55.36	5-8	Shallow	-
BW2B	28/05/2024	1.905	33.799	56.4	52.88	27-33	Deep	-
BW2B	22/08/2024	2.599	33.017	56.4	53.64	27-33	Deep	-
BW2B	7/11/2024	0.927	33.880	56.4	53.64	27-33	Deep	-
BW4A	28/05/2024	2.301	6.598	49.04	46.74	3-6	Shallow	-
BW4A	22/08/2024	1.517	6.585	49.04	47.52	3-6	Shallow	-
BW4A	7/11/2024	2.265	6.568	49.04	46.78	3-6	Shallow	-
BW4B	28/05/2024	1.986	32.961	49.06	47.07	27-33	Deep	-
BW4B	22/08/2024	1.503	32.975	49.06	47.56	27-33	Deep	-
BW4B	7/11/2024	0.735	33.320	49.06	48.33	27-33	Deep	-
BW5A	28/05/2024	4.618	8.012	45.56	40.94	4-7	Shallow	-
BW5A	22/08/2024	3.227	8.041	45.56	42.33	4-7	Shallow	-
BW5A	7/11/2024	4.546	8.019	45.56	41.01	4-7	Shallow	-
BW5B	28/05/2024	3.668	32.921	46.51	42.84	27-33	Deep	-
BW5B	22/08/2024	4.555	32.875	46.51	41.96	27-33	Deep	-
BW5B	7/11/2024	3.265	16.735	46.51	43.25	27-33	Deep	-

SWL = standing water level

mBTC = metres below top of casing

mAHD = metres Australian height datum

[illegible]

Legend:
 - Not analysed / not calculated
 LOR – Limit of Recording
 * LOR Exceeds Guideline Trigger Value
 Sample Type: N - Primary, FD - Duplicate, FT - Triplicate
 % = percent
 µS/cm = microSiemens per centimeter
 MEQ/L =
 mg/L = milligrams per liter
 pH units = pH units
 µg/L = micrograms per liter
 uS/cm = microSiemens per centimeter

Action Levels:
¹ANZG 2018, Toxicant default guideline values for water quality in aquatic ecos
 Exceeds two or more action levels - see superscripts for specific action

Lab Qualifiers:
J - The analyte was positively identified; associated numerical value is the approximate concentration of the analyte in the sample.

[illegible]

Legend:

- Not analysed / not calculated

LOR – Limit of Recording

* LOR Exceeds Guideline Trigger Value

Sample Type: N - Primary, FD - Duplicate, FT - Triplicate

% = percent

$\mu\text{S}/\text{cm}$ = microSiemens per centimeter

MEQ/L =

mg/L = milligrams per liter

pH units = pH units

ug/L = micrograms per liter

Action Levels:

¹ANZG 2018. Toxicant default guideline values for water quality in aquatic ecos

Exceeds two or more action levels - see superscripts for specific actions

Lab Qualifiers:

J - The analyte was positively identified; associated numerical value is the approximate

Well ID	Date Sampled	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Comments
MW1	28/05/2024	7.02	23.10	4040.00	1.67	28.10	High turbidity, pale grey, yellow-grey suspended sediments.
MW1	22/08/2024	6.76	20.50	11716.00	1.46	25.80	Mod turbidity, beige-brown, no odour, no sheen, brown-grey suspended sediments.
MW1	7/11/2024	6.69	23.70	10997.00	3.75	62.80	Low to high turbidity, grey, soil-like odour, brown-grey suspended sediments.
MW4	27/05/2024	6.75	18.20	23960.00	1.86	150.90	Low turbidity, clear, no odour, black suspended sediments.
MW4	22/08/2024	6.80	20.80	22209.00	0.56	-3.00	Low turbidity, clear, no odour, no sheen, black suspended sediments.
MW4	7/11/2024	6.73	21.30	24348.00	1.80	27.50	Low turbidity, clear, soil-like odour, brown suspended sediments.
BW1	27/05/2024	6.69	20.70	8050.00	2.27	-156.10	Low turbidity, pale yellow, hydrogen sulfide odour, yellow suspended sediments.
BW1	22/08/2024	6.28	19.10	18837.00	0.74	-144.50	Low turbidity, clear, black suspended sediments.
BW1	7/11/2024	6.19	24.80	20045.00	2.05	75.00	Low turbidity (moderate turbidity towards bottom of hydrasleeve), clear-yellow, no odour, brown suspended sediments.
BW2A	27/05/2024	6.26	20.40	21410.00	0.86	-158.20	Moderate turbidity, brown, hydrogen sulfide odour, black and brown suspended sediments.
BW2A	22/08/2024	7.39	21.30	2771.00	3.33	27.00	Low to moderate turbidity, brown, decomposing organic odour, brown suspended sediments.
BW2A	7/11/2024	6.93	23.10	2316.00	1.85	-27.40	Low turbidity, clear-grey, slight hydrogen sulphide odour, grey-black suspended sediments.
BW2B	27/05/2024	6.98	20.60	3350.00	1.56	-202.00	Low turbidity, clear, slight hydrogen sulfide odour, no suspended sediments.
BW2B	22/08/2024	6.96	21.70	1808.00	1.61	-40.40	Low turbidity, clear, no odour, black grey suspended sediments.
BW2B	7/11/2024	7.48	23.40	3374.00	3.79	76.90	Low turbidity, clear-yellow, no odour, brown black suspended sediments.
BW4A	28/05/2024	6.90	18.80	9280.00	2.01	143.80	High turbidity, orange-grey, no odour, orange grey suspended sediments.
BW4A	22/08/2024	7.09	18.30	13745.00	1.69	110.80	High turbidity, orange, no odour, orange-brown suspended sediments.
BW4A	7/11/2024	7.25	21.60	13314.00	1.60	73.50	Moderate to high turbidity, orange, no odour, orange suspended sediments.
BW4B	28/05/2024	6.55	20.00	17760.00	1.36	44.50	Moderate turbidity, pale beige, no odour, pale beige suspended sediments.
BW4B	22/08/2024	6.53	19.20	18330.00	0.95	7.50	Moderate to high turbidity, brown-grey, hydrogen sulphide odour, brown-grey-orange suspended sediments.
BW4B	7/11/2024	6.61	19.80	18763.00	0.76	80.70	low to moderate turbidity, light-brown-clear, slight hydrogen sulphide odour, brown suspended sediments.
BW5A	28/05/2024	6.84	17.10	22330.00	1.96	49.70	Moderate turbidity, no odour, clear to pale brown towards bottom of hydrasleeve, grey suspended sediments.
BW5A	22/08/2024	7.06	19.70	15913.00	0.28	-69.20	Low turbidity, clear, no odour, grey suspended sediments.
BW5A	7/11/2024	6.66	21.40	26065.00	1.07	34.20	Low to moderate turbidity, clear-brown, no odour, brown suspended sediments.
BW5B	28/05/2024	6.97	17.40	11160.00	1.36	-21.70	Low turbidity, clear, no odour, no suspended sediments.
BW5B	22/08/2024	6.59	20.40	25653.00	0.88	19.50	High turbidity, brown, no odour, brown-grey suspended sediments.
BW5B	7/11/2024	7.23	21.70	17006.00	1.06	31.10	Low turbidity, clear, soil-like odour, minor-brown suspended sediments.

µS = microsiemens

cm = centimetres

mg = milligram

L = Litre

mV = millivolts

BW1 (27th May - 7th November 2022)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	215.67	37.40	6.60	6,528.00	596.20	3.46	2,986.00	679.60
UCL	299.64	57.61	6.60	8,728.64	861.81	4.61	3,948.47	1,016.39
Median	191.00	32.00	6.60	6,700.00	621.00	3.10	3,130.00	758.00
Standard Deviation	49.81	21.20	0.00	2,308.06	278.58	1.20	1,009.45	353.23
Coefficient of Variation	0.23	0.57	0.00	0.35	0.47	0.35	0.34	0.52
Skewness	1.68	0.10	--	-1.42	-0.81	0.52	-1.00	0.36
Minimum	183.00	10.00	6.60	2,720.00	172.00	2.00	1,400.00	320.00
Maximum	273.00	65.00	6.60	8,740.00	908.00	5.20	4,100.00	1,170.00
Count (n)	3	5	5	5	5	5	5	5
Mann-Kendall S	--	-6	0	-4	-2	-8	-2	-2
95% confidence	--	No Trend	No Trend	No Trend	No Trend	Negative Trend	No Trend	No Trend
Sen Slope	--	-0.052	0.0000	-0.095	0.080	-0.003	0.262	0.273

BW2A (27th May - 7th November 2022)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	351.00	82.17	5.67	4,392.33	392.67	18.00	2,055.67	385.33
UCL	420.38	99.87	5.67	8,014.32	744.69	25.79	3,621.28	709.83
Median	355.00	89.50	5.67	2,655.00	203.50	23.00	1,445.00	179.50
Standard Deviation	58.97	21.52	0.000000000000010	4,402.99	427.94	9.47	1,903.20	394.47
Coefficient of Variation	0.17	0.26	0.0000000000000017	1.00	1.09	0.53	0.93	1.02
Skewness	-0.10	-0.73	-1.37	0.77	1.21	-0.97	0.71	0.90
Minimum	290.00	52.00	5.67	560.00	50.00	4.00	300.00	76.00
Maximum	404.00	102.00	5.67	10,000.00	1,110.00	26.00	4,720.00	901.00
Count (n)	4	6	6	6	6	6	6	6
Mann-Kendall S	2	7	0	-3	-1	2	-1	-1
95% confidence	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend
Sen Slope	--	-0.050	0.0000	-13.371	-0.949	0.025	-5.382	-0.494

BW2B (27th May - 7th November 2022)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	486.00	58.86	6.29	2,176.71	216.86	18.00	1,038.71	285.29
UCL	874.67	74.37	6.29	4,719.70	490.23	22.59	2,186.19	518.20
Median	331.50	51.00	6.29	1,000.00	67.00	20.00	393.00	142.00
Standard Deviation	330.36	21.13	0.000000000000010	3,462.75	372.25	6.24	1,562.49	317.16
Coefficient of Variation	0.68	0.36	0.0000000000000015	1.59	1.72	0.35	1.50	1.11
Skewness	1.99	1.18	-1.30	2.50	2.51	-2.52	2.22	1.32
Minimum	300.00	40.00	6.29	216.00	39.00	4.00	158.00	27.00
Maximum	981.00	98.00	6.29	9,920.00	1,050.00	22.00	4,420.00	860.00
Count (n)	4	7	7	7	7	7	7	7
Mann-Kendall S	4	12	0	5	11	-8	11	7
95% confidence	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend
Sen Slope	--	0.033	0.0000	1.034	0.045	-0.002	0.467	0.146

BW4A (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	540.33	270.20	6.60	5,744.00	347.60	22.20	3,112.00	175.20
UCL	643.19	438.72	6.60	6,159.69	416.72	47.73	3,563.13	193.38
Median	572.00	224.00	6.60	5,500.00	350.00	12.00	3,270.00	175.00
Standard Deviation	61.01	176.74	0.00	435.98	72.49	26.78	473.15	19.07
Coefficient of Variation	0.11	0.65	0.00	0.08	0.21	1.21	0.15	0.11
Skewness	-1.71	2.02	--	0.50	-0.13	2.21	-0.34	-0.23
Minimum	470.00	150.00	6.60	5,300.00	260.00	8.00	2,600.00	150.00
Maximum	579.00	580.00	6.60	6,280.00	425.00	70.00	3,600.00	197.00
Count (n)	3	5	5	5	5	5	5	5
Mann-Kendall S	--	2	0	5	6	-1	2	0
95% confidence	--	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend
Sen Slope	--	0.090	0.0000	-0.314	0.025	0.003	0.826	-0.103

BW4B (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	679.67	578.60	6.60	7,220.00	299.40	64.60	3,310.00	12.20
UCL	744.88	689.71	6.60	8,455.14	362.20	72.33	3,796.64	15.29
Median	684.00	570.00	6.60	7,010.00	328.00	68.00	3,500.00	10.75
Standard Deviation	38.68	116.53	0.00	1,295.43	65.87	8.11	510.39	3.24
Coefficient of Variation	0.06	0.20	0.00	0.18	0.22	0.13	0.15	0.27
Skewness	-0.50	-0.79	--	0.13	-1.57	-1.59	-1.21	2.24
Minimum	639.00	400.00	6.60	5,500.00	190.00	51.00	2,500.00	10.75
Maximum	716.00	713.00	6.60	9,000.00	352.00	72.00	3,800.00	18.00
Count (n)	3	5	5	5	5	5	5	5
Mann-Kendall S	--	6	0	0	4	5	6	-4
95% confidence	--	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend
Sen Slope	--	0.291	0.0000	4.196	0.197	0.021	1.717	0.0000

BW5A (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	899.33	377.20	6.60	9,160.00	627.40	30.20	4,478.00	288.20
UCL	923.67	404.40	6.60	10,005.06	683.60	33.98	4,640.84	343.46
Median	891.00	380.00	6.60	9,140.00	640.00	31.00	4,450.00	294.00
Standard Deviation	14.43	28.53	0.00	886.31	58.94	3.96	170.79	57.96
Coefficient of Variation	0.02	0.08	0.00	0.10	0.09	0.13	0.04	0.20
Skewness	1.73	-0.41	--	-0.50	-1.37	-1.09	0.33	-0.08
Minimum	891.00	336.00	6.60	7,910.00	530.00	24.00	4,290.00	220.00
Maximum	916.00	413.00	6.60	10,000.00	690.00	34.00	4,700.00	356.00
Count (n)	3	5	5	5	5	5	5	5
Mann-Kendall S	--	-2	0	-7	2	-6	-8	6
95% confidence	--	No Trend	No Trend	No Trend	No Trend	No Trend	Negative Trend	No Trend
Sen Slope	--	0.007	0.0000	0.0000	0.167	0.0007	-0.071	-0.156

BW5B (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	792.67	362.40	6.60	6,188.00	246.20	56.00	3,098.00	63.20
UCL	917.54	417.53	6.60	7,460.67	284.36	66.27	3,758.31	96.78
Median	755.00	360.00	6.60	6,300.00	250.00	54.00	2,900.00	73.67
Standard Deviation	74.07	57.82	0.00	1,334.79	40.03	10.77	692.55	35.22
Coefficient of Variation	0.09	0.16	0.00	0.22	0.16	0.19	0.22	0.56
Skewness	1.70	0.48	--	0.11	-0.09	0.04	0.24	-1.90
Minimum	745.00	298.00	6.60	4,470.00	191.00	43.00	2,250.00	2.00
Maximum	878.00	444.00	6.60	8,000.00	300.00	67.00	4,000.00	93.00
Count (n)	3	5	5	5	5	5	5	5
Mann-Kendall S	--	-4	0	-8	-6	-7	-8	-7
95% confidence	--	No Trend	No Trend	Negative Trend	No Trend	No Trend	Negative Trend	No Trend
Sen Slope	--	-0.134	0.0000	-3.173	-0.031	-0.024	-1.660	-0.014

MW1 (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	860.40	131.56	8.33	4,110.00	437.00	30.22	2,325.56	734.11
UCL	1,162.35	145.75	10.04	5,191.22	581.63	36.45	2,855.92	807.86
Median	941.00	130.00	9.25	3,580.00	388.00	31.00	2,060.00	765.00
Standard Deviation	316.69	22.90	2.75	1,743.91	233.27	10.05	855.43	118.95
Coefficient of Variation	0.37	0.17	0.33	0.42	0.53	0.33	0.37	0.16
Skewness	-2.02	-0.49	-3.00	2.16	2.65	-1.65	2.46	-0.71
Minimum	305.00	96.00	1.00	2,610.00	270.00	7.00	1,600.00	530.00
Maximum	1,080.00	160.00	9.25	8,390.00	1,040.00	40.00	4,490.00	890.00
Count (n)	5	9	9	9	9	9	9	9
Mann-Kendall S	-10	-15	2	0	4	-25	1	-2
95% confidence	Negative Trend	No Trend	No Trend	No Trend	No Trend	Negative Trend	No Trend	No Trend
Sen Slope	0.955	0.070	0.0000	2.808	0.357	0.012	0.416	0.468

MW4 (27th May - 7th November 2024)	Bicarbonate Alkalinity as CaCO3 (mg/L)	Calcium (mg/L)	Carbonate Alkalinity as CaCO3 (mg/L)	Chloride (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulphate as SO4 2- (mg/L)
Mean	666.50	194.43	7.71	4,976.00	602.57	14.96	2,869.43	676.71
UCL	752.08	272.54	7.71	7,479.65	876.34	19.84	4,084.68	1,004.00
Median	675.00	252.00	7.71	5,570.00	735.00	18.00	3,600.00	794.00
Standard Deviation	72.74	106.37	0.0000000000000010	3,409.18	372.78	6.64	1,654.79	445.65
Coefficient of Variation	0.11	0.55	0.0000000000000012	0.69	0.62	0.44	0.58	0.66
Skewness	-0.68	-1.23	1.30	-0.26	-1.02	-1.24	-1.14	-0.58
Minimum	570.00	31.00	7.71	402.00	50.00	4.00	396.00	59.00
Maximum	746.00	262.00	7.71	9,600.00	970.00	20.00	4,300.00	1,180.00
Count (n)	4	7	7	7	7	7	7	7
Mann-Kendall S	0	3	0	-3	3	3	3	-1
95% confidence	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend	No Trend
Sen Slope	--	0.326	0.0000	23.747	1.382	0.020	5.590	2.683



ATTACHMENT C NATA ANALYTICAL DATA

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

Sydney Laboratory

179 Magowan Road, Girmeeen, NSW 2145

+61 2 8900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory

Unit 1/21 Smallwood Place, Murrumbidgee, QLD 4172

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☐ Perth Laboratory

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+61 8 6253 4444 EnviroSampleWA@aurifins.com

☐ Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175

+61 3 8564 5000 EnviroSampleVic@envirofins.com

Company		ERM SYD		Project No		0606483		Project Manager		Russell Jarman		Sampler(s)		Tavishi Peiris / Shanaya Strachan	
Address		L14 207 Kent Street Sydney NSW 2000		Project Name		CSR - Badgerys Creek		EDD Format		ESdet, EColIS etc		EQUIS		Tavishi Peiris	
Contact Name		Tavishi Peiris		Email for Invoice		russell.jarman@erm.com au.accounts@erm.com		Email for Results		russell.jarman@erm.com, tavishi.peiris@erm.com, shanaya.strachan@erm.com		Containers		Required Turnaround Time (TAT)	
Phone No		0449118330		Special Directions				Purchase Order				Change container type & size if necessary		Default will be 5 days if not ticked	
Quote ID No				Where results are requested, please specify "Toxic" or "Falcon" SARF does must be used to protect SUTR printing.								500mL Plastic		250mL Plastic	
												125mL Plastic		200mL Amber Glass	
												40mL VOA vial		500mL PFAS Bottle	
												Jer (Glass or HDPE)		Other (Asbestos AS4904, WA Guidelines)	
														☐ Overnight (reporting by 9am) ♦ ☐ Same day ♦ ☐ 1 day ♦ ☐ 2 days ♦ ☐ 3 days ♦ ☒ 5 days (Standard) ☐ Other (	
														Sample Comments / Dangerous Goods Hazard Warning	
No	Client Sample ID	Sampled Date/Time	Matrix	pH	TDS	EC	Dissolved Metals (Aluminium, Arsenic, Cadmium, Chromium, Copper, Lead, Manganese, Molybdenum, Nickel, Selenium, Zinc, Boron, Iron)	Major Cations and Anions	TRH / BTEX						
1	BW1-241107	7/11/24	W	X	X	X	X	X	X						
2	MW4-241107														
3	BW2a-241107														
4	BW2b-241107														
5	MW1-241107														
6	BW4a-241107														
7	BW4b-241107														
8	BW5a-241107														
9	BW5b-241107														
10	ROI-241107														
Total Counts															
Method of Shipment		☐ Courier (#) ☐ Hand Delivered ☐ Postal		Name		TAVISHI PEIRIS		Signature				Date		7/11/24	
Laboratory Use Only		Received By		Elizabeth Brotherton		Signature				Date		8/11		Time	
		Received By				Signature				Date				Time	

Eurofins Environment Testing Australia Pty Ltd EnviroSales@eurofins.com

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

1158091

☒ Sydney Laboratory☐ Brisbane Laboratory☐ Perth Laboratory

Melbourne Laboratory

6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

[illegible]

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road Welshpool WA 6106 +61 8 6253 4444 NATA# 2377 Site# 2370 & 2554

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road Penrose, Auckland 1061 +64 9 526 4551 IANZ# 1327	Unit C1/4 Pacific Rise, Mount Wellington, Auckland 1061 +64 9 525 0568 IANZ# 1308	43 Detroit Drive Rolleston, Christchurch 7675 +64 3 343 5201 IANZ# 1290	1277 Cameron Road, Gate Pa, Tauranga 3112 +64 9 525 0568 IANZ# 1402

Sample Receipt Advice

Company name: ERM Sydney
Contact name: Russell Jarman
Project name: CSR-BADGERYS CREEK
Project ID: 606483
Turnaround time: 5 Day
Date/Time received: Nov 8, 2024 9:56 AM
Eurofins reference: 1158091

Sample Information

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

Notes

TS,TB not received analysis cancelled.

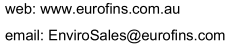
Contact

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

Bonnie Pu on phone : or by email: BonniePu@eurofins.com

Results will be delivered electronically via email to Russell Jarman - russell.jarman@erm.com.

Note: A copy of these results will also be delivered to the general ERM Sydney email address.



ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Montmorey Road Dandenong South VIC 3175 +61 3 8564 5000 NATA# 1261 Site# 1254	19/8 Lewalan Street Grovedale VIC 3216 +61 3 8564 5000 NATA# 1261 Site# 25403	179 Magowar Road Girraween NSW 2145 +61 2 9900 8400 NATA# 1261 Site# 18217	Unit 1, 2 Dacre Street Mitchell ACT 2911 +61 2 6113 8091 NATA# 1261 Site# 25466	1/21 Smallwood Place Murarie QLD 4172 T: +61 7 3902 4600 NATA# 1261 Site# 20794 & 2780	1/2 Frost Drive Mayfield West NSW 2304 +61 2 4968 8448 NATA# 1261 Site# 25079

ABN: 91 05 0159 898

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WA 6106
+61 8 6253 4444
NATA# 2377
Site# 2370 & 2554

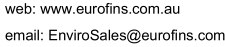
NZBN: 9429046024954

Auckland	Auckland (Focus)	Christchurch	Tauranga
35 O'Rorke Road	Unit C1/4 Pacific Rise,	43 Detroit Drive	12777 Cameron Road,
Penrose,	Mout Wellington,	Rolloston,	Gate Pa,
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IANZ# 1327	IANZ# 1308	IANZ# 1290	IANZ# 1402

Received: Nov 8, 2024 9:56 AM
Due: Nov 15, 2024
Priority: 5 Day
Contact Name: Russell Jarman

Eurofins Analytical Services Manager : Bonnie Pu

[illegible]



ABN: 50 005 085 521

ABN: 91 05 0159 898

NZBN: 9429046024954

Received: Nov 8, 2024 9:56 AM
Due: Nov 15, 2024
Priority: 5 Day
Contact Name: Russell Jarman

Eurofins Analytical Services Manager : Bonnie Pu

[illegible]

ERM Sydney
Level 15, 309 Kent St
Sydney
NSW 2000



NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Russell Jarman**

Report **1158091-W-V2**
Project name **CSR-BADGERYS CREEK**
Project ID **606483**
Received Date **Nov 08, 2024**

Client Sample ID			BW1_241107	MW4_241107	BW2A_241107	BW2B_241107
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S24- No0021805	S24- No0021806	S24- No0021807	S24- No0021808
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{*N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	123	118	118	119
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Ammonia (as N)	0.01	mg/L	0.33	1.6	0.05	< 0.01
Chloride	1	mg/L	7900	9600	560	1000
Conductivity (at 25 °C)	10	uS/cm	24000	30000	1600	2200
Nitrate (as N)	0.02	mg/L	0.12	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	6.6	7.5	7.7	8.1
Sulphate (as SO4)	2	mg/L	800	1100	76	130
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	16000	20000	1100	1500
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	170	790	330	340
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20

Client Sample ID			BW1_241107	MW4_241107	BW2A_241107	BW2B_241107
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S24-No0021805	S24-No0021806	S24-No0021807	S24-No0021808
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit				
Alkali Metals						
Calcium	0.5	mg/L	29	260	52	51
Magnesium	0.5	mg/L	760	970	50	71
Potassium	0.5	mg/L	3.1	20	26	19
Sodium	0.5	mg/L	3500	4300	300	490
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.001	0.002	0.001	0.002
Boron (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.001	0.001	0.008
Iron (filtered)	0.05	mg/L	5.5	0.88	0.81	0.06
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	1.4	0.15	0.17	0.099
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Nickel (filtered)	0.001	mg/L	0.008	< 0.001	0.003	0.003
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	0.15	< 0.005	< 0.005	0.044

Client Sample ID			MW1_241107	BW4A_241107	BW4B_241107	BW5A_241107
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S24-No0021809	S24-No0021810	S24-No0021811	S24-No0021812
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{*N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	112	124	115	117
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01

Client Sample ID			MW1_241107	BW4A_241107	BW4B_241107	BW5A_241107
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			S24- No0021809	S24- No0021810	S24- No0021811	S24- No0021812
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit				
Ammonia (as N)	0.01	mg/L	0.32	< 0.01	11	0.17
Chloride	1	mg/L	4100	5500	9000	10000
Conductivity (at 25 °C)	10	uS/cm	14000	15000	25000	30000
Nitrate (as N)	0.02	mg/L	0.03	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	7.4	7.8	7.2	7.3
Sulphate (as SO4)	2	mg/L	890	150	< 40	240
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	8400	9100	17000	20000
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	1000	520	670	970
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Alkali Metals						
Calcium	0.5	mg/L	130	580	570	390
Magnesium	0.5	mg/L	420	350	340	690
Potassium	0.5	mg/L	39	70	68	34
Sodium	0.5	mg/L	2000	3600	3500	4600
Heavy Metals						
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Boron (filtered)	0.05	mg/L	0.11	0.08	< 0.05	< 0.05
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.039	< 0.001	0.004
Iron (filtered)	0.05	mg/L	0.91	< 0.05	3.5	< 0.05
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	0.61	0.051	0.068	0.66
Molybdenum (filtered)	0.005	mg/L	< 0.005	0.018	< 0.005	< 0.005
Nickel (filtered)	0.001	mg/L	0.002	0.007	< 0.001	0.002
Selenium (filtered)	0.001	mg/L	< 0.001	0.003	< 0.001	< 0.001
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	< 0.005	0.009	0.023	0.006

Client Sample ID			BW5B_241107	R01_241107	DO1_241107
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S24- No0021813	S24- No0021814	S24- No0021815
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons					
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{*N01}	0.05	mg/L	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1

Client Sample ID			BW5B_241107	R01_241107	DO1_241107
Sample Matrix			Water	Water	Water
Eurofins Sample No.			S24-No0021813	S24-No0021814	S24-No0021815
Date Sampled			Nov 07, 2024	Nov 07, 2024	Nov 07, 2024
Test/Reference	LOR	Unit			
Total Recoverable Hydrocarbons					
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1	< 0.1	< 0.1
BTEX					
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	117	115	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions					
Naphthalene ^{N02}	0.01	mg/L	< 0.01	< 0.01	< 0.01
Ammonia (as N)	0.01	mg/L	7.6	0.03	0.23
Chloride	1	mg/L	6300	4.7	3200
Conductivity (at 25 °C)	10	uS/cm	19000	< 10	14000
Nitrate (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02
pH (at 25 °C)	0.1	pH Units	7.8	5.9	7.6
Sulphate (as SO4)	2	mg/L	< 200	< 2	720
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	12000	< 10	8400
Alkalinity (speciated)					
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	860	< 20	970
Carbonate Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20
Alkali Metals					
Calcium	0.5	mg/L	320	< 0.5	130
Magnesium	0.5	mg/L	250	< 0.5	410
Potassium	0.5	mg/L	54	< 0.5	38
Sodium	0.5	mg/L	2900	< 0.5	2000
Heavy Metals					
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Boron (filtered)	0.05	mg/L	0.06	< 0.05	0.11
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001
Iron (filtered)	0.05	mg/L	0.06	< 0.05	0.97
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Manganese (filtered)	0.005	mg/L	0.12	< 0.005	0.64
Molybdenum (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005
Nickel (filtered)	0.001	mg/L	0.002	< 0.001	0.002
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Silver (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005
Zinc (filtered)	0.005	mg/L	0.015	< 0.005	< 0.005

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Eurofins Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Nov 13, 2024	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Nov 13, 2024	7 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Sydney	Nov 13, 2024	7 Days
BTEX - Method: LTM-ORG-2010 BTEX and Volatile TRH	Sydney	Nov 13, 2024	14 Days
Major Cations			
Ammonia (as N) - Method: LTM-INO-4200 Ammonia by Discrete Analyser	Sydney	Nov 13, 2024	28 Days
Alkali Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Nov 13, 2024	180 Days
Major Anions			
Chloride - Method: LTM-INO-4270 Anions by Ion Chromatography	Sydney	Nov 13, 2024	28 Days
Nitrate (as N) - Method: LTM-INO-4120 Analysis of NOx NO2 NH3 by FIA	Melbourne	Nov 11, 2024	28 Days
Sulphate (as SO4) - Method: In-house method LTM-INO-4270 Sulphate by Ion Chromatograph	Sydney	Nov 13, 2024	28 Days
Alkalinity (speciated) - Method: LTM-INO-4250 Alkalinity by Electrometric Titration	Sydney	Nov 13, 2024	14 Days
Conductivity (at 25 °C) - Method: LTM-INO-4030 Conductivity	Sydney	Nov 13, 2024	28 Days
pH (at 25 °C) - Method: LTM-GEN-7090 pH in water by ISE	Sydney	Nov 13, 2024	6 Hours
Heavy Metals (filtered) - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Sydney	Nov 22, 2024	180 Days
Total Dissolved Solids Dried at 180 °C ± 2 °C - Method: LTM-INO-4170 Total Dissolved Solids in Water	Sydney	Nov 13, 2024	7 Days



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Company Name: ERM Sydney

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Project Name: CSR-BADGERYS CREEK

Project ID: 606483

Order No.:

Report #: 1158091

Phone: 02 8584 8888

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Received: Nov 8, 2024 9:56 AM

Due: Nov 15, 2024

Priority: 5 Day

Contact Name: Russell Jarman

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Aluminium (filtered)	Arsenic (filtered)	Boron (filtered)	Cadmium (filtered)	CANCELLED*	Chromium (filtered)	Conductivity (at 25 °C)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Molybdenum (filtered)	Nickel (filtered)	pH (at 25 °C)	Selenium (filtered)	Zinc (filtered)	Major Anions	Major Cations	Eurofins Suite B1	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254																						X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
External Laboratory																									
No	Sample ID	Sample Date	Sampling Time	Matrix	LAB ID																				
1	BW1_241107	Nov 07, 2024		Water	S24-No0021805	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	MW4_241107	Nov 07, 2024		Water	S24-No0021806	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	BW2A_241107	Nov 07, 2024		Water	S24-No0021807	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	BW2B_241107	Nov 07, 2024		Water	S24-No0021808	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	MW1_241107	Nov 07, 2024		Water	S24-No0021809	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	BW4A_241107	Nov 07, 2024		Water	S24-No0021810	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	BW4B_241107	Nov 07, 2024		Water	S24-No0021811	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	BW5A_241107	Nov 07, 2024		Water	S24-No0021812	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	BW5B_241107	Nov 07, 2024		Water	S24-No0021813	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	R01_241107	Nov 07, 2024		Water	S24-No0021814	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11	DO1_241107	Nov 07, 2024		Water	S24-No0021815	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	TS_241107	Nov 07, 2024		Water	S24-No0021816					X															
13	TB_241107	Nov 07, 2024		Water	S24-No0021817					X															



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Received:

Due:

Priority:

Contact Name:

Nov 8, 2024 9:56 AM

Nov 15, 2024

5 Day

Russell Jarman

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail	Aluminium (filtered)	Arsenic (filtered)	Boron (filtered)	Cadmium (filtered)	CANCELLED*	Chromium (filtered)	Conductivity (at 25 °C)	Copper (filtered)	Iron (filtered)	Lead (filtered)	Manganese (filtered)	Molybdenum (filtered)	Nickel (filtered)	pH (at 25 °C)	Selenium (filtered)	Zinc (filtered)	Major Anions	Major Cations	Eurofins Suite B1	Total Dissolved Solids Dried at 180 °C ± 2 °C
																	X			
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	11	11	11	11	2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Melbourne Laboratory - NATA # 1261 Site # 1254																				
Sydney Laboratory - NATA # 1261 Site # 18217	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Test Counts	11	11	11	11	2	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Ammonia (as N)	mg/L	< 0.01			0.01	Pass	
Chloride	mg/L	< 1			1	Pass	
Conductivity (at 25 °C)	uS/cm	< 10			10	Pass	
Sulphate (as SO ₄)	mg/L	< 2			2	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Method Blank							
Heavy Metals							
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Boron (filtered)	mg/L	< 0.05			0.05	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Molybdenum (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Silver (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO ₃)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO ₃)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Sodium			mg/L	< 0.5			0.5	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons									
TRH C6-C9		%	76				70-130	Pass	
TRH C10-C14		%	111				70-130	Pass	
TRH C6-C10		%	75				70-130	Pass	
TRH >C10-C16		%	100				70-130	Pass	
LCS - % Recovery									
BTEX									
Benzene		%	96				70-130	Pass	
Toluene		%	87				70-130	Pass	
Ethylbenzene		%	97				70-130	Pass	
m&p-Xylenes		%	94				70-130	Pass	
o-Xylene		%	103				70-130	Pass	
Xylenes - Total*		%	97				70-130	Pass	
LCS - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions									
Naphthalene		%	101				70-130	Pass	
LCS - % Recovery									
Chloride		%	105				70-130	Pass	
Conductivity (at 25 °C)		%	109				70-130	Pass	
Sulphate (as SO4)		%	102				70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C		%	98				70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Aluminium (filtered)		%	97				80-120	Pass	
Arsenic (filtered)		%	96				80-120	Pass	
Boron (filtered)		%	94				80-120	Pass	
Cadmium (filtered)		%	92				80-120	Pass	
Chromium (filtered)		%	97				80-120	Pass	
Copper (filtered)		%	93				80-120	Pass	
Iron (filtered)		%	94				80-120	Pass	
Lead (filtered)		%	95				80-120	Pass	
Manganese (filtered)		%	94				80-120	Pass	
Molybdenum (filtered)		%	94				80-120	Pass	
Nickel (filtered)		%	93				80-120	Pass	
Selenium (filtered)		%	99				80-120	Pass	
Silver (filtered)		%	102				80-120	Pass	
Zinc (filtered)		%	94				80-120	Pass	
LCS - % Recovery									
Alkalinity (speciated)									
Bicarbonate Alkalinity (as CaCO3)		%	101				70-130	Pass	
LCS - % Recovery									
Alkali Metals									
Calcium		%	107				80-120	Pass	
Magnesium		%	109				80-120	Pass	
Potassium		%	106				80-120	Pass	
Sodium		%	108				80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons				Result 1					
TRH C10-C14	N24-No0025197	NCP	%	86			70-130	Pass	
TRH >C10-C16	N24-No0025197	NCP	%	85			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Alkali Metals				Result 1					
Calcium	N24-No0025162	NCP	%	119			75-125	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium (filtered)	S24-No0024660	NCP	%	94			75-125	Pass	
Arsenic (filtered)	S24-No0020330	NCP	%	91			75-125	Pass	
Boron (filtered)	S24-No0024660	NCP	%	92			75-125	Pass	
Cadmium (filtered)	S24-No0020330	NCP	%	92			75-125	Pass	
Chromium (filtered)	S24-No0020330	NCP	%	95			75-125	Pass	
Copper (filtered)	S24-No0020330	NCP	%	93			75-125	Pass	
Lead (filtered)	S24-No0020330	NCP	%	94			75-125	Pass	
Molybdenum (filtered)	S24-No0024660	NCP	%	112			75-125	Pass	
Nickel (filtered)	S24-No0020330	NCP	%	91			75-125	Pass	
Zinc (filtered)	S24-No0020330	NCP	%	90			75-125	Pass	
Spike - % Recovery									
				Result 1					
Chloride	S24-No0021806	CP	%	99			70-130	Pass	
Sulphate (as SO4)	S24-No0021806	CP	%	104			70-130	Pass	
Spike - % Recovery									
				Result 1					
Nitrate (as N)	M24-No0024543	NCP	%	80			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Iron (filtered)	S24-No0025982	NCP	%	111			75-125	Pass	
Manganese (filtered)	S24-No0025982	NCP	%	97			75-125	Pass	
Selenium (filtered)	S24-No0025982	NCP	%	115			75-125	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Magnesium	S24-No0021815	CP	%	120			75-125	Pass	
Potassium	S24-No0021815	CP	%	90			75-125	Pass	
Sodium	S24-No0021815	CP	%	102			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD			
TRH C10-C14	N24-No0025208	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	N24-No0025208	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	N24-No0025208	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C10-C16	N24-No0025208	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	N24-No0025208	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	N24-No0025208	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ammonia (as N)	S24-No0030323	NCP	mg/L	20	20	3.0	30%	Pass	
Chloride	S24-No0021805	CP	mg/L	7900	7700	3.0	30%	Pass	
Nitrate (as N)	M24-No0020991	NCP	mg/L	0.07	0.06	21	30%	Pass	
Sulphate (as SO4)	S24-No0021805	CP	mg/L	800	750	6.0	30%	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	S24-No0021805	CP	mg/L	16000	15000	4.0	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Carbonate Alkalinity (as CaCO3)	S24-No0016231	NCP	mg/L	< 20	< 20	<1	30%	Pass	

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	S24-No0021805	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	S24-No0021805	CP	mg/L	0.001	0.001	3.0	30%	Pass
Boron (filtered)	S24-No0021805	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Cadmium (filtered)	S24-No0021805	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	S24-No0021805	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	S24-No0021805	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron (filtered)	S24-No0021805	CP	mg/L	5.5	5.6	2.0	30%	Pass
Lead (filtered)	S24-No0021805	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Manganese (filtered)	S24-No0021805	CP	mg/L	1.4	1.4	2.0	30%	Pass
Molybdenum (filtered)	S24-No0021805	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Nickel (filtered)	S24-No0021805	CP	mg/L	0.008	0.008	1.0	30%	Pass
Selenium (filtered)	S24-No0021805	CP	mg/L	< 0.001	0.001	41	30%	Fail
Silver (filtered)	S24-No0021805	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Zinc (filtered)	S24-No0021805	CP	mg/L	0.15	0.15	1.0	30%	Pass
Q15								
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	S24-No0021806	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	S24-No0021806	CP	mg/L	0.002	0.002	1.0	30%	Pass
Boron (filtered)	S24-No0021806	CP	mg/L	< 0.05	0.05	5.0	30%	Pass
Cadmium (filtered)	S24-No0021806	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	S24-No0021806	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	S24-No0021806	CP	mg/L	0.001	0.001	14	30%	Pass
Iron (filtered)	S24-No0021806	CP	mg/L	0.88	1.0	13	30%	Pass
Lead (filtered)	S24-No0021806	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Manganese (filtered)	S24-No0021806	CP	mg/L	0.15	0.15	<1	30%	Pass
Molybdenum (filtered)	S24-No0021806	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Nickel (filtered)	S24-No0021806	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Selenium (filtered)	S24-No0021806	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Silver (filtered)	S24-No0021806	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Zinc (filtered)	S24-No0021806	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
Alkalinity (speciated)				Result 1	Result 2	RPD		
Bicarbonate Alkalinity (as CaCO ₃)	S24-No0021813	CP	mg/L	860	830	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons				Result 1	Result 2	RPD		
TRH C6-C9	S24-No0021814	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass
TRH C6-C10	S24-No0021814	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Toluene	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Ethylbenzene	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
m&p-Xylenes	S24-No0021814	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass
o-Xylene	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total*	S24-No0021814	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S24-No0021814	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass
Duplicate								
Alkali Metals				Result 1	Result 2	RPD		
Calcium	S24-No0021814	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass
Magnesium	S24-No0021814	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass
Potassium	S24-No0021814	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass
Sodium	S24-No0021814	CP	mg/L	< 0.5	< 0.5	<1	30%	Pass

Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Aluminium (filtered)	S24-No0021814	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Arsenic (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Boron (filtered)	S24-No0021814	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Cadmium (filtered)	S24-No0021814	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass
Chromium (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Copper (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Iron (filtered)	S24-No0021814	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass
Lead (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Manganese (filtered)	S24-No0021814	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Molybdenum (filtered)	S24-No0021814	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Nickel (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Selenium (filtered)	S24-No0021814	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Silver (filtered)	S24-No0021814	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Zinc (filtered)	S24-No0021814	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Conductivity (at 25 °C)	S24-No0021815	CP	uS/cm	14000	14000	3.6	30%	Pass
Total Dissolved Solids Dried at 180 °C ± 2 °C	S24-No0021815	CP	mg/L	8400	8700	3.0	30%	Pass

Comments

Report 1158091-W-V2 (amendment to report 1158091-W) has been issued following client request for silver (filtered) results to be added to the report.

Sample Integrity

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

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Bonnie Pu	Analytical Services Manager
Dilani Samarakoon	Senior Analyst-Inorganic
Luke Holt	Senior Analyst-Inorganic
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Ryan Phillips	Senior Analyst-Inorganic



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

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

Measurement uncertainty of test data is available on request or please [click here](#).

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2436380**

Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: RUSSELL JARMAN	Contact	: Jason Dighton
Address	: Level 14 207 Kent Street SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: russell.jarman@erm.com	E-mail	: jason.dighton@alsglobal.com
Telephone	: 02 8586 8717	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 0449086 - Horsley Park	Page	: 1 of 3
Order number	: ----	Quote number	: EP2020ENVRES0018 (EN/000)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: CSR-CAMIDE_LANDFILL		
Sampler	: Shanaya Strachan, TAVISHI PEIRIS		

Dates

Date Samples Received	: 06-Nov-2024 11:00	Issue Date	: 08-Nov-2024
Client Requested Due Date	: 15-Nov-2024	Scheduled Reporting Date	: 15-Nov-2024

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 7.8°C, 6.9°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Proactive Holding Time Report
 - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Unless otherwise stated, analytical work for this work order will be conducted at ALS Sydney, NATA accreditation no. 825, site no. 10911.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months $\pm$ 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exists.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EA005P pH (Auto Titrator)	WATER - EA010P Electrical Conductivity (Auto Titrator)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EP030 BOD	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity	WATER - NT-05 Total Nitrogen
ES2436380-001	04-Nov-2024 00:00	T01_241104	✓	✓	✓	✓	✓	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP005 Total Organic Carbon (TOC)
ES2436380-001	04-Nov-2024 00:00	T01_241104	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

Matrix: **WATER**

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

Method	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
Client Sample ID(s)				Date	Evaluation	Date	Evaluation
EA005-P: pH by Auto Titrator							
T01_241104	Clear Plastic Bottle - Natural	----	04-Nov-2024	06-Nov-2024	✗	----	----



Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email au.accounts@erm.com

ERM GLOBAL EQUIS

- EDI Format - EQUIS V5 ERM (EQUIS_V5_ERM)
- Electronic SRN for EQUIS (ESRN_EQUIS)

Email ermapac@equisonline.com

Email ermapac@equisonline.com

RUSSELL JARMAN

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- A4 - AU Tax Invoice (INV)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 ERM (EQUIS_V5_ERM)
- EDI Format - ESDAT (ESDAT)

Email russell.jarman@erm.com

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Shanaya Strachan

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 ERM (EQUIS_V5_ERM)
- EDI Format - ESDAT (ESDAT)

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TAVISHI PEIRIS

- *AU Certificate of Analysis - NATA (COA)
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)
- Chain of Custody (CoC) (COC)
- EDI Format - EQUIS V5 ERM (EQUIS_V5_ERM)
- EDI Format - ESDAT (ESDAT)

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CERTIFICATE OF ANALYSIS

Work Order	: ES2436483	Page	: 1 of 6
Amendment	: 1		
Client	: ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)	Laboratory	: Environmental Division Sydney
Contact	: RUSSELL JARMAN	Contact	: Jason Dighton
Address	: Level 14 207 Kent Street SYDNEY NSW AUSTRALIA 2000	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 02 8586 8717	Telephone	: +61-2-8784 8555
Project	: 0606483	Date Samples Received	: 08-Nov-2024 10:20
Order number	: ---	Date Analysis Commenced	: 11-Nov-2024
C-O-C number	: ---	Issue Date	: 26-Nov-2024 14:27
Sampler	: Shanaya Strachan, TAVISHI PEIRIS		
Site	: CSR-BADGERYS_CREEK		
Quote number	: EN/000		
No. of samples received	: 1		
No. of samples analysed	: 1		



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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

Ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Amendment (26/11/2024): This report has been amended and re-released to allow the reporting of additional analytical data, specifically method Silver for sample T01-241107 <ES2436483-#001>.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	T01-241107	----	----	----	----
Sampling date / time					07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2436483-001	-----	-----	-----	-----
				Result		----	----	----	----
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.47	----	----	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		12700	----	----	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C									
Total Dissolved Solids @180°C	----	10	mg/L		8200	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		1080	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		1080	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		700	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		4160	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		157	----	----	----	----
Magnesium	7439-95-4	1	mg/L		422	----	----	----	----
Sodium	7440-23-5	1	mg/L		2190	----	----	----	----
Potassium	7440-09-7	1	mg/L		31	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Aluminium	7429-90-5	0.01	mg/L		<0.01	----	----	----	----
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		0.003	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	T01-241107	----	----	----	----
Sampling date / time					07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2436483-001	-----	-----	-----	-----
				Result		----	----	----	----
EG020F: Dissolved Metals by ICP-MS - Continued									
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
Manganese	7439-96-5	0.001	mg/L		0.607	----	----	----	----
Molybdenum	7439-98-7	0.001	mg/L		<0.001	----	----	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	----	----	----	----
Silver	7440-22-4	0.001	mg/L		<0.001	----	----	----	----
Boron	7440-42-8	0.05	mg/L		0.12	----	----	----	----
Iron	7439-89-6	0.05	mg/L		0.73	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		154	----	----	----	----
ø Total Cations	----	0.01	meq/L		139	----	----	----	----
ø Ionic Balance	----	0.01	%		5.09	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	----	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	2	%		97.7	----	----	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	T01-241107	----	----	----	----
				Sampling date / time	07-Nov-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2436483-001	-----	-----	-----	-----
				Result		----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	2	%		108	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		119	----	----	----	----



Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	72	143
Toluene-D8	2037-26-5	75	131
4-Bromofluorobenzene	460-00-4	73	137



QUALITY CONTROL REPORT

Work Order : **ES2436483**

Page : 1 of 7

Amendment : **1**

Client : **ENVIRONMENTAL RESOURCES MANAGEMENT (ERM)**

Laboratory : Environmental Division Sydney

Contact : **RUSSELL JARMAN**

Contact : Jason Dighton

Address : Level 14 207 Kent Street
SYDNEY NSW AUSTRALIA 2000

Address : 277-289 Woodpark Road Smithfield NSW Australia 2164

Telephone : 02 8586 8717

Telephone : +61-2-8784 8555

Project : 0606483

Date Samples Received : 08-Nov-2024

Order number : ---

Date Analysis Commenced : 11-Nov-2024

C-O-C number : ---

Issue Date : 26-Nov-2024

Sampler : Shanaya Strachan, TAVISHI PEIRIS

Site : CSR-BADGERYS_CREEK

Quote number : EN/000

No. of samples received : 1

No. of samples analysed : 1



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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	Position	Accreditation Category
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Sanjeshni Jyoti	Senior Chemist Volatiles	Sydney Organics, Smithfield, NSW



General Comments

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

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

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

Key :
 Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA005P: pH by PC Titrator (QC Lot: 6178873)									
ES2436380-001	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.63	7.64	0.1	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 6178870)									
EN2414437-006	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	6000	5930	1.2	0% - 20%
EN2414436-002	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	6250	6190	0.9	0% - 20%
ES2436380-001	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	14700	14700	0.2	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 6180206)									
ES2436253-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	248	245	1.4	0% - 20%
ES2436301-010	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	1020	1060	4.0	0% - 20%
ES2436451-001	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	272	290	6.4	0% - 20%
ES2436451-011	Anonymous	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	277	278	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6178872)									
ES2436380-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1020	1030	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	1020	1030	0.7	0% - 20%
ES2436406-006	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	<1	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6180988)									
ES2436451-015	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	45	47	3.7	0% - 20%
ES2436595-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	52	55	6.4	0% - 20%



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 6180989)									
ES2436451-015	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	252	231	8.9	0% - 20%
ES2436595-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	180	182	1.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 6182844)									
ES2436602-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	32	26	19.9	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	24	22	8.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	36	34	4.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
ES2436348-015	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	22	22	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	17	17	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	75	74	1.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.0	No Limit
EG020F: Dissolved Metals by ICP-MS (QC Lot: 6182845)									
ES2436348-015	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.017	0.017	0.0	0% - 50%
		EG020A-F: Molybdenum	7439-98-7	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.0	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.005	<0.005	0.0	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.0	No Limit
		EG020A-F: Boron	7440-42-8	0.05	mg/L	0.06	0.08	20.0	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.09	0.09	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 6178014)									
EN2414456-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES2436507-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	30	50.3	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 6178014)									
EN2414456-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES2436507-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	40	75.8	No Limit
EP080: BTEXN (QC Lot: 6178014)									
EN2414456-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP080: BTEXN (QC Lot: 6178014) - continued									
EN2414456-001	Anonymous	EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES2436507-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	5	90.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	5	83.4	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	3	50.3	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit



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

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

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EA005P: pH by PC Titrator (QCLot: 6178873)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	99.8	98.8	101
				----	7 pH Unit	99.7	99.2	101
EA010P: Conductivity by PC Titrator (QCLot: 6178870)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	101	89.9	110
				<1	2100 µS/cm	94.9	90.2	111
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 6180206)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	96.6	87.0	109
				<10	293 mg/L	102	75.2	126
				<10	2410 mg/L	92.6	83.0	124
ED037P: Alkalinity by PC Titrator (QCLot: 6178872)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	97.7	81.0	115
				----	50 mg/L	112	80.0	128
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6180988)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	98.0	82.0	122
				<1	500 mg/L	90.8	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 6180989)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	102	80.9	127
				<1	1000 mg/L	104	80.9	127
ED093F: Dissolved Major Cations (QCLot: 6182844)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	102	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	102	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100	85.0	113
EG020F: Dissolved Metals by ICP-MS (QCLot: 6182845)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	86.3	80.0	116
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	91.0	85.0	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	87.7	84.0	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	88.4	85.0	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	91.4	81.0	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	89.0	83.0	111
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	84.4	82.0	110



Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result			Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6182845) - continued								
EG020A-F: Molybdenum	7439-98-7	0.001	mg/L	<0.001	0.1 mg/L	94.5	79.0	113
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	88.7	82.0	112
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	88.9	85.0	115
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	90.4	81.0	117
EG020A-F: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	86.5	85.0	115
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	86.7	82.0	112
EG020F: Dissolved Metals by ICP-MS (QCLot: 6214628)								
EG020B-F: Silver	7440-22-4	0.001	mg/L	<0.001	0.02 mg/L	78.1	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6178014)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	96.3	75.0	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6178014)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	94.8	75.0	127
EP080: BTEXN (QCLot: 6178014)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	98.2	68.3	119
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	103	73.5	120
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	102	73.8	122
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	117	73.0	122
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	110	76.4	123
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	106	75.5	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery(%) MS	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number			Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6180988)							
ES2436451-015	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6180989)							
ES2436451-015	Anonymous	ED045G: Chloride	16887-00-6	250 mg/L	82.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 6182845)							
ES2436348-016	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	91.9	70.0	130

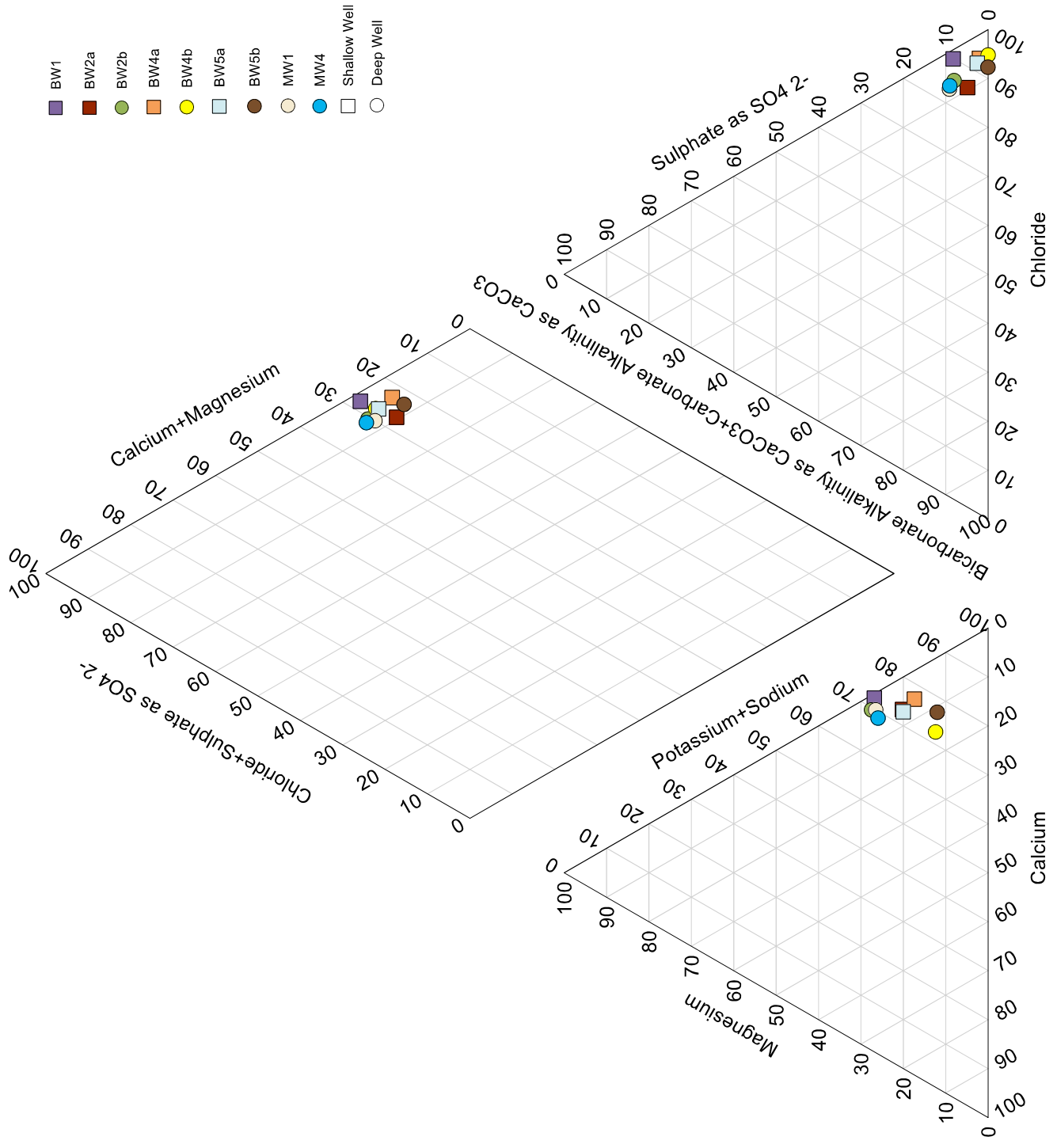


Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 6182845) - continued							
ES2436348-016	Anonymous	EG020A-F: Cadmium	7440-43-9	0.25 mg/L	89.3	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	89.5	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	88.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	83.9	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	88.8	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	89.7	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	93.7	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 6178014)							
EN2414456-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	99.8	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 6178014)							
EN2414456-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	93.3	70.0	130
EP080: BTEXN (QCLot: 6178014)							
EN2414456-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	110	70.0	130
		EP080: Toluene	108-88-3	25 µg/L	108	70.0	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	116	70.0	130
		EP080: meta- & para-Xylene	108-38-3	25 µg/L	120	70.0	130
			106-42-3				
		EP080: ortho-Xylene	95-47-6	25 µg/L	110	70.0	130
		EP080: Naphthalene	91-20-3	25 µg/L	125	70.0	130



ATTACHMENT D PIPER PLOT





ATTACHMENT E CALIBRATION CERTIFICATES

Certificate of Service and Calibration
Interface Meter
Heron H.Oil

Company Name	WAM Scientific
Office Address	26 Bungarra Crescent, Chipping Norton NSW 2170
Phone Number	+61 405 241 484
Contact Name	William Pak
Instrument	Heron H.Oil Interface Meter (60m)
Serial Number	01-8288
Client Name	Tavishi Peiris (ERM)
Project Number	0606483
Comments	CSR Badgerys Creek

Instrument Check			
Item	Test	Test Passed	Comments
9V Battery	Klein Tools MM300 Multimeter	✓	Battery voltage reading above 7.9V
Battery Box	Check	✓	No damage
Face and Back Plates	Check	✓	No damage
Thumb Screws	Check	✓	Rubber ends intact
Tape Hangar/Protector	Check	✓	No damage
On/Off Button	Operation	✓	Button is functional
Buzzer	Operation	✓	Intermittent tone in H ₂ O, solid tone in product
LED Signal Light	Operation	✓	LED light functional – green and red
Probe	Operation/Check	✓	Decontaminated, cleaned and tested
Tape	Condition/Check	✓	Decontaminated and cleaned, no damage
Connection	Check	✓	Probe and link connected correctly and tightly
PCB	Operation	✓	Unit is fully functional
Electronics Panel	Orientation	✓	Correctly aligned

Instrument Readings		
Product	Buzzer	LED Light
H ₂ O	Intermittent	Blinking – Red
Petroleum	Solid	Steady – Red

Declaration
WAM Scientific certifies that the above instrument was successfully tested according to manufacturer's standards and all necessary checks were conducted to ensure the instrument was fully operational prior to dispatch. The interface meter was decontaminated, cleaned and tested with a mixture of tap water and petrol, shielded from ambient light.

Checked By	William Pak
Calibration Date	31/10/2024
Calibration Due	31/04/2025

Company Name	WAM Scientific
Office Address	26 Bungarra Crescent, Chipping Norton NSW 2170
Phone Number	+61 405 241 484
Contact Name	William Pak
Instrument	YSI Pro Quatro Water Quality Meter w/ 1m Quatro Cable
Serial Number	22H104713
Client Name	Tavishi Peiris (ERM)
Project Number	0606483
Comments	CSR Badgerys Creek

Instrument Check

Item	Test	Test Passed	Comments
2 x Alkaline C-size Batteries	Klein Tools MM300 Multimeter	✓	Both batteries reading above 2.9V
Battery Saver Function	Operation	✓	Automatically turns off after 60 minutes if idle
Unit Display	Operation	✓	Screen visible, no damage
Keypad	Operation	✓	Responsive, no damage
Connection Port and Cable	Condition/Check	✓	Clean, no damage
Monitor Housing	Condition/Check	✓	No damage
Firmware	Version	✓	4.0.0
pH Probe	Condition/Calibration	✓	Calibrated and conforms to manufacturer's specs
pH millivolts for pH 7.00	Calibration	✓	pH 7.00 calibration range between 0 mV $\pm$ 50 mV
pH millivolts for pH 4.00	Calibration	✓	pH 4 mV range +165 to +180 from 7 buffer mV value
pH slope	Calibration	✓	Range between 55 to 60 mV/pH (ideal value 59 mV)
Response time < 90 seconds	Calibration	✓	Responds to correct value within 90 seconds
ORP Probe	Condition/Calibration	✓	Calibrated and conforms to manufacturer's specs
ORP Reading	Calibration	✓	Within $\pm$ 80 mV of reference Zobell Reading
Response time < 90 seconds	Calibration	✓	Responds to correct value within 90 seconds
Conductivity/Temp Probe	Condition/Calibration	✓	Calibrated and conforms to manufacturer's specs
Conductivity Cell	Calibration	✓	Conductivity cell constant 5.0 $\pm$ 1.0 in GLP file
Clean Sensor Readings	Calibration	✓	Clean sensor reads less than 3 uS/cm in dry air
Dissolved Oxygen Probe	Condition/Calibration	✓	Calibrated and conforms to manufacturer's specs
DO Cap	Condition/Calibration	✓	1.25 mil PE membrane (yellow membrane)
DO Sensor in Use	Condition	✓	Polarographic DO sensor
DO Sensor Value	Calibration	✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA

Instrument Readings

Parameter	Standard Used	Reference No.	Calibration Value	Pre-Cal Value	Post-Cal Value	Units
Temperature	Centre 370 Therm.	Room Temp.	21.2	22.7	21.2	°C
pH	pH 4.00	417183	4.01	4.01	4.01	pH
pH	pH 7.00	419528	7.00	7.03	7.00	pH
Conductivity	2760 μ S/cm at 25°C	399819	2760	2773	2760	μ S/cm
ORP	Zobell A & B	420448/418958	237.4	173.0	237.4	mV
Zero Dissolved O ₂	NaSO ₃ in Distilled H ₂ O	426184	0.0	0.4	0.0	%
100% Dissolved O ₂	100% Air Saturated H ₂ O	Fresh Air	100.0	94.9	100.0	%

Declaration

WAM Scientific certifies that the above instrument was successfully tested according to manufacturer's standards and all necessary checks were conducted to ensure the instrument was fully operational prior to dispatch. The calibration data supplied was obtained in accordance with manufacturer's specifications using solutions of known values.

Calibrated By	William Pak
Calibration Date	31/10/2024
Calibration Due	31/04/2025



Well ID	Easting	Northing	Surface Elevation (mAHD)	Depth to Bottom (mBTC)	Date	SWL (mbtoc)	SWL (mAHD)
BW1	291741	6247174	56.060	7.109	25-Sep-18	3.900	52.880
					02-Dec-22	2.602	53.458
					19-Oct-23	4.503	51.557
					27-May-24	4.202	51.858
					22-Aug-24	3.245	52.815
					07-Nov-24	6.393	49.667
					06-Feb-25	4.029	52.031
BW2a	291911	6247442	56.290	7.723	25-Sep-18	4.090	52.850
					02-Dec-22	2.795	53.495
					19-Oct-23	6.077	50.283
					28-May-24	3.516	52.774
					22-Aug-24	2.760	53.530
					07-Nov-24	2.756	53.534
					06-Feb-25	2.863	53.427
BW2b	291914	6247440	56.400	33.017	25-Sep-18	5.380	51.690
					02-Dec-22	4.161	52.239
					19-Oct-23	3.666	52.734
					28-May-24	1.905	54.495
					22-Aug-24	2.599	53.801
					07-Nov-24	0.927	55.473
					06-Feb-25	0.964	55.436
BW4a	293602	6247294	49.040	6.585	25-Sep-18	3.140	46.610
					02-Dec-22	1.635	47.405
					18-Oct-23	3.041	45.999
					28-May-24	2.301	46.739
					22-Aug-24	1.517	47.523
					07-Nov-24	2.265	46.775
					06-Feb-25	2.947	46.093
BW4b	293602	6247295	49.060	32.975	25-Sep-18	2.510	47.330
					02-Dec-22	1.660	47.400
					18-Oct-23	1.985	47.075
					28-May-24	1.986	47.074
					22-Aug-24	1.503	47.557
					07-Nov-24	0.735	48.325
					06-Feb-25	1.779	47.281
BW5a	293098	6246559	45.560	8.041	25-Sep-18	4.350	42.920
					02-Dec-22	4.989	40.571
					18-Oct-23	5.673	39.887
					28-May-24	4.618	40.942
					22-Aug-24	3.227	42.333
					07-Nov-24	4.546	41.014
					06-Feb-25	4.459	41.101
BW5b	293098	6246561	46.510	32.875	25-Sep-18	2.940	44.270
					02-Dec-22	4.432	42.078
					18-Oct-23	5.408	41.102
					28-May-24	3.668	42.842
					22-Aug-24	4.555	41.955
					07-Nov-24	3.265	43.245
					06-Feb-25	2.272	44.238
MW1	292250	6246990	63.990	28.901	25-Sep-18	13.780	50.990
					02-Dec-22	12.629	51.361
					19-Oct-23	12.808	51.182
					28-May-24	13.516	50.474
					22-Aug-24	13.639	50.351
					07-Nov-24	15.292	48.698
					06-Feb-25	17.040	46.950
MW4	291750	6247169	56.430	24.100	25-Sep-18	5.780	50.920
					02-Dec-22	4.859	51.571
					19-Oct-23	5.932	50.498
					27-May-24	7.936	48.494
					22-Aug-24	6.575	49.855
					07-Nov-24	9.035	47.395
					06-Feb-25	11.475	44.955

SWL = standing water level
mBTC = metres below top of casing
mAHD = metres Australian height datum

Monitoring Well ID	Date	Depth to SWL (mbTOC)	Depth to bottom (mbTOC)	Top of Casing Elevation (mAHD)	Corrected Water Level (mAHD)	Screened interval (mbTOC)	Deep / Shallow Well	Comments
MW1	28/05/2024	13.516	--	63.99	50.47	25-31	Deep	-
	22/08/2024	13.639	28.901	63.99	50.35	25-31	Deep	-
	7/11/2024	15.292	29.09	63.99	48.70	25-31	Deep	-
	6/02/2025	17.040	32.7	63.99	46.95	25-31	Deep	-
MW4	28/05/2024	7.936	23.679	56.43	48.49	22-28	Deep	-
	22/08/2024	6.575	24.100	56.43	49.86	22-28	Deep	-
	7/11/2024	9.035	24.24	56.43	47.40	22-28	Deep	-
	6/02/2025	11.475	24.234	56.43	44.96	22-28	Deep	-
BW1	28/05/2024	4.202	7.907	56.06	51.86	5-8	Shallow	-
	22/08/2024	3.245	7.109	56.06	52.82	5-8	Shallow	-
	7/11/2024	6.393	7.135	56.06	49.67	5-8	Shallow	-
	6/02/2025	4.029	7.094	56.06	52.03	5-8	Shallow	-
BW2A	28/05/2024	3.516	7.725	56.29	54.39	5-8	Shallow	-
	22/08/2024	2.760	7.723	56.29	53.69	5-8	Shallow	-
	7/11/2024	2.756	7.734	56.29	55.36	5-8	Shallow	-
	6/02/2025	2.863	7.689	56.29	56.29	5-8	Shallow	-
BW2B	28/05/2024	1.905	33.799	56.4	52.88	27-33	Deep	-
	22/08/2024	2.599	33.017	56.4	53.64	27-33	Deep	-
	7/11/2024	0.927	33.880	56.4	53.64	27-33	Deep	-
	6/02/2025	0.964	28.489	56.4	53.54	27-33	Deep	-
BW4A	28/05/2024	2.301	6.598	49.04	46.74	3-6	Shallow	-
	22/08/2024	1.517	6.585	49.04	47.52	3-6	Shallow	-
	7/11/2024	2.265	6.568	49.04	46.78	3-6	Shallow	-
	6/02/2025	2.863	7.689	49.04	46.18	3-7	Shallow	-
BW4B	28/05/2024	1.986	32.961	49.06	47.07	27-33	Deep	-
	22/08/2024	1.503	32.975	49.06	47.56	27-33	Deep	-
	7/11/2024	0.735	33.320	49.06	48.33	27-33	Deep	-
	6/02/2025	1.779	31.091	49.06	47.28	27-33	Deep	-
BW5A	28/05/2024	4.618	8.012	45.56	40.94	4-7	Shallow	-
	22/08/2024	3.227	8.041	45.56	42.33	4-7	Shallow	-
	7/11/2024	4.546	8.019	45.56	41.01	4-7	Shallow	-
	6/02/2025	4.459	8.131	45.56	41.10	4-7	Shallow	-
BW5B	28/05/2024	3.668	32.921	46.51	42.84	27-33	Deep	-
	22/08/2024	4.555	32.875	46.51	41.96	27-33	Deep	-
	7/11/2024	3.265	16.735	46.51	43.25	27-33	Deep	-
	6/02/2025	2.272	16.849	46.51	44.24	27-33	Deep	-

SWL = standing water level
 mbTOC = metres below top of casing
 mAHD = metres Australian height datum

Legend:
 - Not analysed / not calculated
 LOR – Limit of Recording
 * LOR Exceeds Guideline Trigger Value
 Sample Type: N - Primary, FD - Duplicate, FT - Triplicate
 mg/L = milligrams per liter
 pH units = pH units
 ug/L = micrograms per liter
 uS/cm = microSiemens per centimeter

Exceeds two or more action levels - see superscripts for specific action

Well ID	Date Sampled	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Comments
MW1	28/05/2024	7.02	23.10	4040.00	1.67	28.10	High turbidity, pale grey, yellow-grey suspended sediments.
	22/08/2024	6.76	20.50	11716.00	1.46	25.80	Moderate turbidity, beige-brown, no odour, no sheen, brown-grey suspended sediments.
	7/11/2024	6.69	23.70	10997.00	3.75	62.80	Low to high turbidity, grey, soil-like odour, brown-grey suspended sediments.
	6/02/2025	6.72	25.20	9974.00	0.83	39.20	Moderate turbidity, grey, no odour, no sheen, grey suspended sediments.
MW4	27/05/2024	6.75	18.20	23960.00	1.86	150.90	Low turbidity, clear, no odour, black suspended sediments.
	22/08/2024	6.80	20.80	22209.00	0.56	-3.00	Low turbidity, clear, no odour, no sheen, black suspended sediments.
	7/11/2024	6.73	21.30	24348.00	1.80	27.50	Low turbidity, clear, soil-like odour, brown suspended sediments.
	6/02/2025	6.76	27.50	21842.00	1.83	-29.50	Low turbidity, clear, no odour, no sheen, grey-black suspended sediments.
BW1	27/05/2024	6.69	20.70	8050.00	2.27	-156.10	Low turbidity, pale yellow, hydrogen sulfide odour, yellow suspended sediments.
	22/08/2024	6.28	19.10	18837.00	0.74	-144.50	Low turbidity, clear, black suspended sediments.
	7/11/2024	6.19	24.80	20045.00	2.05	75.00	Low turbidity (moderate turbidity towards bottom of hydrasleeve), clear-yellow, no odour, brown suspended sediments.
	6/02/2025	6.03	24.30	21268.00	1.18	-65.00	Low to moderate turbidity, grey-clear, hydrogen sulfide odour, no sheen, no suspended sediments.
BW2A	27/05/2024	6.26	20.40	21410.00	0.86	-158.20	Moderate turbidity, brown, hydrogen sulfide odour, black and brown suspended sediments.
	22/08/2024	7.39	21.30	2771.00	3.33	27.00	Low to moderate turbidity, brown, decomposing organic odour, brown suspended sediments.
	7/11/2024	6.93	23.10	2316.00	1.85	-27.40	Low turbidity, clear-grey, slight hydrogen sulphide odour, grey-black suspended sediments.
	6/02/2025	7.60	22.00	2829.00	4.47	-5.60	Low turbidity, clear, no odour, no sheen, black suspended sediments.
BW2B	27/05/2024	6.98	20.60	3350.00	1.56	-202.00	Low turbidity, clear, slight hydrogen sulfide odour, no suspended sediments.
	22/08/2024	6.96	21.70	1808.00	1.61	-40.40	Low turbidity, clear, no odour, black grey suspended sediments.
	7/11/2024	7.48	23.40	3374.00	3.79	76.90	Low turbidity, clear-yellow, no odour, brown black suspended sediments.
	6/02/2025	7.05	24.70	2307.00	1.17	-94.30	Low turbidity, clear, no odour, no sheen, black suspended sediments.
BW4A	28/05/2024	6.90	18.80	9280.00	2.01	143.80	High turbidity, orange-grey, no odour, orange grey suspended sediments.
	22/08/2024	7.09	18.30	13745.00	1.69	110.80	High turbidity, orange, no odour, orange-brown suspended sediments.
	7/11/2024	7.25	21.60	13314.00	1.60	73.50	Moderate to high turbidity, orange, no odour, orange suspended sediments.
	6/02/2025	6.79	26.80	11020.00	0.38	57.90	High turbidity, brown, hydrogen sulfide odour, no sheen, brown suspended sediments.
BW4B	28/05/2024	6.55	20.00	17760.00	1.36	44.50	Moderate turbidity, pale beige, no odour, pale beige suspended sediments.
	22/08/2024	6.53	19.20	18330.00	0.95	7.50	Moderate to high turbidity, brown-grey, hydrogen sulphide odour, brown-grey-orange suspended sediments.
	7/11/2024	6.61	19.80	18763.00	0.76	80.70	Low to moderate turbidity, light-brown-clear, slight hydrogen sulphide odour, brown suspended sediments.
	6/02/2025	6.52	27.70	9876.00	3.10	-28.20	Moderate turbidity, grey-brown, slight hydrogen sulfide odour, no sheen, brown suspended sediments.
BW5A	28/05/2024	6.84	17.10	22330.00	1.96	49.70	Moderate turbidity, no odour, clear to pale brown towards bottom of hydrasleeve, grey suspended sediments.
	22/08/2024	7.06	19.70	15913.00	0.28	-69.20	Low turbidity, clear, no odour, grey suspended sediments.
	7/11/2024	6.66	21.40	26065.00	1.07	34.20	Low to moderate turbidity, clear-brown, no odour, brown suspended sediments.
	6/02/2025	6.59	24.40	22283.00	1.29	23.20	Moderate to high turbidity, brown-black, no odour, no sheen, black suspended sediments.
BW5B	28/05/2024	6.97	17.40	11160.00	1.36	-21.70	Low turbidity, clear, no odour, no suspended sediments.
	22/08/2024	6.59	20.40	25653.00	0.88	19.50	High turbidity, brown, no odour, brown-grey suspended sediments.
	7/11/2024	7.23	21.70	17006.00	1.06	31.10	Low turbidity, clear, soil-like odour, minor-brown suspended sediments.
	6/02/2025	6.92	25.80	14967.00	1.24	-87.50	Low turbidity, clear, no odour, no sheen, minor brown suspended sediments.

µS = microsiemens
 cm = centimetres
 mg = milligram
 L = Litre
 mV = millivolts





Groundwater Analytical Results - Laboratory Parameters, Cations and Anions, Natural Attenuation Parameters, Alkalinity, BTEXN, Total Petroleum Hydrocarbons, Metals, Total Recoverable Hydrocarbons NEPM 2013, Polycyclic Aromatic Hydrocarbons

Sample Date - 2025-04-01 - 2025-12-31
Site ID: CSR-Badgerys Creek

					Alkalinity				BTEXN						Cations and Anions										Laboratory Parameters	
					Alkalinity - Total as CaCO3	Bicarbonate Alkalinity as HCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Benzene	Toluene	Ethylbenzene	m,p-Xylenes	o-Xylene	Xylene - Total	Naphthalene	Calcium	Magnesium	Sodium	Potassium	Sulphate as SO4 2-	Chloride	Fluoride	Total Dissolved Solids	pH, Lab	Dissolved Solids - Total	
LOR					20	20	20	20	0.001	0.001	0.001	0.002	0.001	0.003	0.01	0.5	0.5	0.5	0.5	2	1	1	10	0.1	10	
Units					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH units	mg/L	
Action Levels																										
ANZG 2018 SLIGHT-MOD DIST - FRESH 95/99 ¹									0.95	0.18	0.08	0.075	0.35		0.016							1.7				
Sample Location	Date Sampled	Sample ID	Depth Range (m)	Sample Type																						
	5/05/2025	BW1_202505		N	170	170	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	32	930	4400	3.4	570	4900	< 10	16000	7.3	16000	
	5/05/2025	BW2A_202505		N	510	510	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	54	62	340	15	99	2700	3.7	1300	8.2	1300	
	5/05/2025	BW2B_202505		N	430	430	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	61	60	360	22	55	620	< 1	1400	7.6	1400	
	5/05/2025	BW4A_202505		N	670	670	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	190	400	3000	18	250	8400	< 5	12000	7.5	12000	
	5/05/2025	BW4B_202505		N	720	720	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	600	340	3500	73	19	10000	< 5	16000	7.6	16000	
	5/05/2025	BW5A_202505		N	1100	1100	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	390	670	4400	39	320	11000	< 10	18000	7.4	18000	
	5/05/2025	BW5B_202505		N	880	880	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	310	230	2800	55	< 200	11000	< 10	11000	8.0	11000	
	5/05/2025	D01_202505		N	1100	1100	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	380	650	4400	38	310	11000	< 10	20000	7.6	20000	
	5/05/2025	MW1_202505		N	1200	1200	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	150	460	2200	41	2100	9600	< 5	9400	7.8	9400	
	5/05/2025	MW4_202505		N	810	810	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	210	690	3400	19	2100	16000	< 5	14000	8.2	14000	
	5/05/2025	R01_202505		N	< 20	< 20	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	< 0.5	< 0.5	< 0.5	< 0.5	< 200	110	< 10	18	6.5	18	
	5/05/2025	TB01_202505		N					< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003												
	5/05/2025	TS01_202505		N					110	110	100	110	110	110												
Statistical Summary																										
Number of Results					11	11	11	11	13	13	13	13	13	13	11	11	11	11	11	11	11	11	11	11	11	
Number of Detects					10	10	0	0	1	1	1	1	1	1	0	10	10	10	10	9	11	1	11	11	11	
Number of non-Detects					1	1	11	11	12	12	12	12	12	12	11	1	1	1	1	2	0	10	0	0	0	
Minimum Concentration					< 20	< 20	< 20	< 20	< 0.001	< 0.001	< 0.001	< 0.002	< 0.001	< 0.003	< 0.01	< 0.5	< 0.5	< 0.5	< 0.5	19	110	< 1	18	6.5	18	
Minimum Detect					170	170	-	-	110	110	100	110	110	110	-	32	60	340	3.4	19	110	3.7	18	6.5	18	
Maximum Concentration					1200	1200	< 20	< 20	110	110	100	110	110	110	< 0.01	600	930	4400	73	2100	16000	< 10	20000	8.2	20000	
Maximum Detect					1200	1200	-	-	110	110	100	110	110	110	-	600	930	4400	73	2100	16000	3.7	20000	8.2	20000	
Mean Concentration					690.909	690.909	10	10	8.462	8.462	7.693	8.462	8.462	8.463	0.005	216.114	408.386	2618.205	29.423	547.545	7757.273	3.564	10828.909	7.609	10828.909	
Geometric Average					458.03	458.03	10	10	0.001	0.001	0.001	0.002	0.001	0.004	0.005	92.707	171.354	950.67	16.421	221.983	4504.576	3.067	5032.6	7.595	5032.6	
Standard Deviation					384.823	384.823	0	0	30.508	30.508	27.735	30.508	30.508	30.508	0	186.87	304.199	1685.534	22.097	783.659	5014.862	1.557	7064.647	0.476	7064.647	
Median Average					720	720	10	10	0	0	0	0.001	0	0.002	0.005	190	400	3000	22	250	9600	3.7	12000	7.6	12000	
Geometric Standard Deviation					3.996	3.996	1	1	30.319	30.319	29.528	25.017	30.319	22.356	1	8.742	10.539	17.99	5.03	4.283	4.644	1.983	8.188	1.067	8.188	
Number of Guideline Exceedances(Detects Only)					0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	

Legend:
- Not analysed / not calculated
LOR – Limit of Recording
* LOR Exceeds Guideline Trigger Value
Sample Type: N - Primary, FD - Duplicate, FT - Triplicate
mg/L = milligrams per liter
pH units = pH units
ug/L = micrograms per liter

Action Levels:
¹ANZG 2018, Toxicant default guideline values for water quality in aquatic ecosystems, Slightly to r
Exceeds two or more action levels - see superscripts for specific action levels



Groundwater Analytical Results - Laboratory Parameters

Sample Date - 2025-04-01 - 2025-12-31
Site ID: CSR-Badgerys Creek

					Alkalini			Metals											enuation		Aromatic H		Total Petroleum Hydrocarb			
					Alkalinity - Total as CaCO3	Bicarbonate Alkalinity as HCO3	Aluminium - Dissolved	Arsenic - Dissolved	Boron - Dissolved	Cadmium - Dissolved	Chromium - Dissolved	Copper - Dissolved	Iron - Dissolved	Lead - Dissolved	Manganese - Dissolved	Molybdenum - Dissolved	Nickel - Dissolved	Selenium - Dissolved	Silver - Dissolved	Zinc - Dissolved	Sulphate as SO4 2-	Naphthalene	C6 - C9 Fraction	C10 - C14 Fraction	C15 - C28 Fraction	C29 - C36 Fraction
LOR					20	20	0.05	0.001	0.05	0.0002	0.001	0.001	0.05	0.001	0.005	0.005	0.001	0.001	0.005	0.005	2	0.01	20	50	100	100
Units					mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	ug/L	ug/L	ug/L
Action Levels																										
ANZG 2018 SLIGHT-MOD DIST - FRESH 95/99 ¹							0.055	0.013	0.94	0.0002	0.001	0.0014		0.0034	1.9	0.034	0.011	0.005	5e-005	0.008		0.016				
Sample Location	Date Sampled	Sample ID	Depth Range (m)	Sample Type																						
	5/05/2025	BW1_202505		N	170	170	< 0.05	0.002	< 0.05	< 0.0002	< 0.001	< 0.001	7.2	< 0.001	2.1	< 0.005	0.013	< 0.001	< 0.005	0.15	570	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW2A_202505		N	510	510	< 0.05	0.003	0.05	< 0.0002	< 0.001	0.002	0.07	< 0.001	1.1	< 0.005	0.003	< 0.001	< 0.005	0.048	99	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW2B_202505		N	430	430	< 0.05	0.002	0.06	< 0.0002	< 0.001	< 0.001	0.54	< 0.001	0.48	< 0.005	0.003	< 0.001	< 0.005	< 0.005	55	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW4A_202505		N	670	670	< 0.05	0.001	0.06	< 0.0002	< 0.001	< 0.001	1.6	< 0.001	1.2	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	250	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW4B_202505		N	720	720	< 0.05	< 0.001	0.06	0.0009	< 0.001	0.29	1.8	< 0.001	0.25	< 0.005	0.003	< 0.001	< 0.005	0.035	19	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW5A_202505		N	1100	1100	< 0.05	< 0.001	0.05	0.0002	< 0.001	0.005	< 0.05	< 0.001	0.66	< 0.005	0.003	< 0.001	< 0.005	0.063	320	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	BW5B_202505		N	880	880	< 0.05	0.001	0.08	< 0.0002	< 0.001	< 0.001	5.2	< 0.001	0.23	< 0.005	< 0.001	< 0.001	< 0.005	0.016	< 200	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	D01_202505		N	1100	1100	< 0.05	0.001	< 0.05	0.0003	< 0.001	0.002	0.15	< 0.001	0.67	< 0.005	0.002	< 0.001	< 0.005	0.067	310	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	MW1_202505		N	1200	1200	0.08	< 0.001	0.18	< 0.0002	< 0.001	0.012	< 0.05	< 0.001	0.53	< 0.005	0.002	< 0.001	< 0.005	0.007	2100	< 0.01	40	< 50	< 100	< 100
	5/05/2025	MW4_202505		N	810	810	< 0.05	0.001	0.07	< 0.0002	< 0.001	< 0.001	0.89	< 0.001	0.11	< 0.005	0.001	< 0.001	< 0.005	0.007	2100	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	R01_202505		N	< 20	< 20	< 0.05	< 0.001	< 0.05	< 0.0002	< 0.001	< 0.001	< 0.05	< 0.001	< 0.005	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	< 200	< 0.01	< 20	< 50	< 100	< 100
	5/05/2025	TB01_202505		N																						
	5/05/2025	TS01_202505		N																						
Statistical Summary																										
Number of Results					11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	
Number of Detects					10	10	1	7	8	3	0	5	8	0	10	0	8	0	0	8	9	0	1	0	0	0
Number of non-Detects					1	1	10	4	3	8	11	6	3	11	1	11	3	11	11	3	2	11	10	11	11	11
Minimum Concentration					< 20	< 20	< 0.05	0.001	< 0.05	< 0.0002	< 0.001	< 0.001	< 0.05	< 0.001	< 0.005	< 0.005	< 0.001	< 0.001	< 0.005	< 0.005	19	< 0.01	< 20	< 50	< 100	< 100
Minimum Detect					170	170	0.08	0.001	0.05	0.0002	-	0.002	0.07	-	0.11	-	0.001	-	-	0.007	19	-	40	-	-	-
Maximum Concentration					1200	1200	0.08	0.003	0.18	0.0009	< 0.001	0.29	7.2	< 0.001	2.1	< 0.005	0.013	< 0.001	< 0.005	0.15	2100	< 0.01	40	< 50	< 100	< 100
Maximum Detect					1200	1200	0.08	0.003	0.18	0.0009	-	0.29	7.2	-	2.1	-	0.013	-	-	0.15	2100	-	40	-	-	-
Mean Concentration					690.909	690.909	0.03	0.001	0.062	0	0	0.029	1.593	0	0.667	0.002	0.003	0	0.002	0.036	547.545	0.005	12.727	25	50	50
Geometric Average					458.03	458.03	0.028	0.001	0.053	0	0	0.002	0.346	0	0.329	0.002	0.002	0	0.002	0.016	221.983	0.005	11.343	25	50	50
Standard Deviation					384.823	384.823	0.017	0.001	0.043	0	0	0.087	2.406	0	0.608	0	0.004	0	0	0.045	783.659	0	9.045	0	0	0
Median Average					720	720	0.025	0.001	0.06	0	0	0	0.54	0	0.53	0.002	0.002	0	0.002	0.016	250	0.005	10	25	50	50
Geometric Standard Deviation					3.996	3.996	1.42	1.894	1.805	2.038	1	7.447	8.675	1	6.175	1	2.751	1	1	4.475	4.283	1	1.519	1	1	1
Number of Guideline Exceedances(Detects Only)					0	0	1	0	0	2	0	5	0	0	1	0	1	0	0	6	0	0	0	0	0	0

Legend:

- Not analysed / not calculated

LOR – Limit of Recording

* LOR Exceeds Guideline Trigger Value

Sample Type: N - Primary, FD - Duplicate, FT - Triplicate

mg/L = milligrams per liter

pH units = pH units

ug/L = micrograms per liter

Action Levels:

¹ANZG 2018, Toxicant default guideline values for water quality in aquatic ecosystems, Slightly to r
Exceeds two or more action levels - see superscripts for specific action levels



Groundwater Analytical Results - Laboratory Parameter:

Sample Date - 2025-04-01 - 2025-12-31
Site ID: CSR-Badgerys Creek

					Alkalinity			Total Recoverable Hydrocarbons NEPM 2013						
					Alkalinity - Total as CaCO3	Bicarbonate Alkalinity as HCO3	C10 - C36 Fraction (sum)	C6 - C10 Fraction	C6 - C10 Fraction minus BTEX (F1)	>C10 - C16 Fraction	C10 - C16 minus Napthalene (F2)	>C16 - C34 Fraction	>C34 - C40 Fraction	>C10 - C40 Fraction (sum)
LOR					20	20	100	0.02	0.02	0.05	0.05	0.1	0.1	0.1
Units					mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Action Levels														
ANZG 2018 SLIGHT-MOD DIST - FRESH 95/99 ¹														
Sample Location	Date Sampled	Sample ID	Depth Range (m)	Sample Type										
	5/05/2025	BW1_202505		N	170	170	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW2A_202505		N	510	510	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW2B_202505		N	430	430	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW4A_202505		N	670	670	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW4B_202505		N	720	720	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW5A_202505		N	1100	1100	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	BW5B_202505		N	880	880	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	D01_202505		N	1100	1100	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	MW1_202505		N	1200	1200	< 100	0.04	0.04	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	MW4_202505		N	810	810	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	R01_202505		N	< 20	< 20	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
	5/05/2025	TB01_202505		N										
	5/05/2025	TS01_202505		N										
Statistical Summary														
Number of Results					11	11	11	11	11	11	11	11	11	11
Number of Detects					10	10	0	1	1	0	0	0	0	0
Number of non-Detects					1	1	11	10	10	11	11	11	11	11
Minimum Concentration					< 20	< 20	< 100	< 0.02	< 0.02	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
Minimum Detect					170	170	-	0.04	0.04	-	-	-	-	-
Maximum Concentration					1200	1200	< 100	0.04	0.04	< 0.05	< 0.05	< 0.1	< 0.1	< 0.1
Maximum Detect					1200	1200	-	0.04	0.04	-	-	-	-	-
Mean Concentration					690.909	690.909	50	0.013	0.013	0.025	0.025	0.05	0.05	0.05
Geometric Average					458.03	458.03	50	0.011	0.011	0.025	0.025	0.05	0.05	0.05
Standard Deviation					384.823	384.823	0	0.009	0.009	0	0	0	0	0
Median Average					720	720	50	0.01	0.01	0.025	0.025	0.05	0.05	0.05
Geometric Standard Deviation					3.996	3.996	1	1.519	1.519	1	1	1	1	1
Number of Guideline Exceedances(Detects Only)					0	0	0	0	0	0	0	0	0	0

Legend:

- Not analysed / not calculated
LOR – Limit of Recording
* LOR Exceeds Guideline Trigger Value
Sample Type: N - Primary, FD - Duplicate, FT - Triplicate
mg/L = milligrams per liter
pH units = pH units
ug/L = micrograms per liter

Action Levels:

¹ANZG 2018, Toxicant default guideline values for water quality in aquatic ecosystems, Slightly to r
Exceeds two or more action levels - see superscripts for specific action levels

Well ID	Easting	Northing	Surface Elevation (mAHD)	Depth to Bottom (mBTOC)	Date	SWL (mbtoc)	SWL (mAHD)
BW1	291741	6247174	56.060	7.102	25-Sep-18	3.900	52.880
					02-Dec-22	2.602	53.458
					19-Oct-23	4.503	51.557
					27-May-24	4.202	51.858
					22-Aug-24	3.245	52.815
					07-Nov-24	6.393	49.667
					06-Feb-25	4.029	52.031
					05-May-25	4.998	51.062
BW2a	291911	6247442	56.290	7.805	25-Sep-18	4.090	52.850
					02-Dec-22	2.795	53.495
					19-Oct-23	6.077	50.283
					28-May-24	3.516	52.774
					22-Aug-24	2.760	53.530
					07-Nov-24	2.756	53.534
					06-Feb-25	2.863	53.427
					05-May-25	3.448	52.842
BW2b	291914	6247440	56.400	33.843	25-Sep-18	5.380	51.690
					02-Dec-22	4.161	52.239
					19-Oct-23	3.666	52.734
					28-May-24	1.905	54.495
					22-Aug-24	2.599	53.801
					07-Nov-24	0.927	55.473
					06-Feb-25	0.964	55.436
					05-May-25	1.550	54.850
BW4a	293602	6247294	49.040	6.530	25-Sep-18	3.140	46.610
					02-Dec-22	1.635	47.405
					18-Oct-23	3.041	45.999
					28-May-24	2.301	46.739
					22-Aug-24	1.517	47.523
					07-Nov-24	2.265	46.775
					06-Feb-25	2.947	46.093
					05-May-25	2.460	46.580
BW4b	293602	6247295	49.060	32.577	25-Sep-18	2.510	47.330
					02-Dec-22	1.660	47.400
					18-Oct-23	1.985	47.075
					28-May-24	1.986	47.074
					22-Aug-24	1.503	47.557
					07-Nov-24	0.735	48.325
					06-Feb-25	1.779	47.281
					05-May-25	2.900	46.160
BW5a	293098	6246559	45.560	8.020	25-Sep-18	4.350	42.920
					02-Dec-22	4.989	40.571
					18-Oct-23	5.673	39.887
					28-May-24	4.618	40.942
					22-Aug-24	3.227	42.333
					07-Nov-24	4.546	41.014
					06-Feb-25	4.459	41.101
					05-May-25	5.650	39.910
BW5b	293098	6246561	46.510	3.012	25-Sep-18	2.940	44.270
					02-Dec-22	4.432	42.078
					18-Oct-23	5.408	41.102
					28-May-24	3.668	42.842
					22-Aug-24	4.555	41.955
					07-Nov-24	3.265	43.245
					06-Feb-25	2.272	44.238
					05-May-25	3.012	43.498
MW1	292250	6246990	63.990	28.282	25-Sep-18	13.780	50.990
					02-Dec-22	12.629	51.361
					19-Oct-23	12.808	51.182
					28-May-24	13.516	50.474
					22-Aug-24	13.639	50.351
					07-Nov-24	15.292	48.698
					06-Feb-25	17.040	46.950
					05-May-25	21.160	42.830
MW4	291750	6247169	56.430	24.310	25-Sep-18	5.780	50.920
					02-Dec-22	4.859	51.571
					19-Oct-23	5.932	50.498
					27-May-24	7.936	48.494
					22-Aug-24	6.575	49.855
					07-Nov-24	9.035	47.395
					06-Feb-25	11.475	44.955
					05-May-25	15.541	40.889

SWL = standing water level
mBTOC = metres below top of casing
mAHD = metres Australian height datum

Monitoring Well ID	Date	Depth to SWL (mbTOC)	Depth to bottom (mbTOC)	Top of Casing Elevation (mAHD)	Corrected Water Level (mAHD)	Screened interval (mbTOC)	Deep / Shallow Well	Comments
MW1	28/05/2024	13.516	--	63.99	50.47	25-31	Deep	-
	22/08/2024	13.639	28.901	63.99	50.35	25-31	Deep	-
	7/11/2024	15.292	29.09	63.99	48.70	25-31	Deep	-
	6/02/2025	17.040	32.7	63.99	46.95	25-31	Deep	-
	5/05/2025	21.160	28.82	63.99	42.83	25-31	Deep	-
MW4	28/05/2024	7.936	23.679	56.43	48.49	22-28	Deep	-
	22/08/2024	6.575	24.100	56.43	49.86	22-28	Deep	-
	7/11/2024	9.035	24.24	56.43	47.40	22-28	Deep	-
	6/02/2025	11.475	24.234	56.43	44.96	22-28	Deep	-
	5/05/2025	15.541	24.31	56.43	40.89	22-28	Deep	-
BW1	28/05/2024	4.202	7.907	56.06	51.86	5-8	Shallow	-
	22/08/2024	3.245	7.109	56.06	52.82	5-8	Shallow	-
	7/11/2024	6.393	7.135	56.06	49.67	5-8	Shallow	-
	6/02/2025	4.029	7.094	56.06	52.03	5-8	Shallow	-
	5/05/2025	4.998	7.102	56.06	51.06	5-8	Shallow	-
BW2A	28/05/2024	3.516	7.725	56.29	54.39	5-8	Shallow	-
	22/08/2024	2.760	7.723	56.29	53.69	5-8	Shallow	-
	7/11/2024	2.756	7.734	56.29	55.36	5-8	Shallow	-
	6/02/2025	2.863	7.689	56.29	54.74	5-8	Shallow	-
	5/05/2025	3.448	7.804	56.29	53.99	5-8	Shallow	-
BW2B	28/05/2024	1.905	33.799	56.4	52.88	27-33	Deep	-
	22/08/2024	2.599	33.017	56.4	53.64	27-33	Deep	-
	7/11/2024	0.927	33.880	56.4	53.64	27-33	Deep	-
	6/02/2025	0.964	28.489	56.4	53.54	27-33	Deep	-
	5/05/2025	1.550	33.843	56.4	52.95	27-33	Deep	-
BW4A	28/05/2024	2.301	6.598	49.04	46.74	3-6	Shallow	-
	22/08/2024	1.517	6.585	49.04	47.52	3-6	Shallow	-
	7/11/2024	2.265	6.568	49.04	46.78	3-6	Shallow	-
	6/02/2025	2.863	7.689	49.04	46.18	3-7	Shallow	-
	5/05/2025	2.460	6.530	49.04	46.58	3-7	Shallow	-
BW4B	28/05/2024	1.986	32.961	49.06	47.07	27-33	Deep	-
	22/08/2024	1.503	32.975	49.06	47.56	27-33	Deep	-
	7/11/2024	0.735	33.320	49.06	48.33	27-33	Deep	-
	6/02/2025	1.779	31.091	49.06	47.28	27-33	Deep	-
	5/05/2025	2.900	32.577	49.06	46.16	27-33	Deep	-
BW5A	28/05/2024	4.618	8.012	45.56	40.94	4-7	Shallow	-
	22/08/2024	3.227	8.041	45.56	42.33	4-7	Shallow	-
	7/11/2024	4.546	8.019	45.56	41.01	4-7	Shallow	-
	6/02/2025	4.459	8.131	45.56	41.10	4-7	Shallow	-
	5/05/2025	5.650	8.020	45.56	39.91	4-7	Shallow	-
BW5B	28/05/2024	3.668	32.921	46.51	42.84	27-33	Deep	-
	22/08/2024	4.555	32.875	46.51	41.96	27-33	Deep	-
	7/11/2024	3.265	16.735	46.51	43.25	27-33	Deep	-
	6/02/2025	2.272	16.849	46.51	44.24	27-33	Deep	-
	45782.000	3.012	16.689	46.51	43.50	27-33	Deep	-

SWL = standing water level

mbTOC = metres below top of casing

mAHD = metres Australian height datum

Well ID	Date Sampled	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation Reduction Potential (mV)	Comments
MW1	28/05/2024	7.02	23.10	4040.00	1.67	28.10	High turbidity, pale grey, yellow-grey suspended sediments.
	22/08/2024	6.76	20.50	11716.00	1.46	25.80	Moderate turbidity, beige-brown, no odour, no sheen, brown-grey suspended sediments.
	7/11/2024	6.69	23.70	10997.00	3.75	62.80	Low to high turbidity, grey, soil-like odour, brown-grey suspended sediments.
	6/02/2025	6.72	25.20	9974.00	0.83	39.20	Moderate turbidity, grey, no odour, no sheen, grey suspended sediments.
	5/05/2025	6.67	21.60	13827.00	2.36	69.40	Moderate to high turbidity, brown, no odour, no sheen, brown suspended sediments.
MW4	27/05/2024	6.75	18.20	23960.00	1.86	150.90	Low turbidity, clear, no odour, black suspended sediments.
	22/08/2024	6.80	20.80	22209.00	0.56	-3.00	Low turbidity, clear, no odour, no sheen, black suspended sediments.
	7/11/2024	6.73	21.30	24348.00	1.80	27.50	Low turbidity, clear, soil-like odour, brown suspended sediments.
	6/02/2025	6.76	27.50	21842.00	1.83	-29.50	Low turbidity, clear, no odour, no sheen, grey-black suspended sediments.
	5/05/2025	6.86	22.70	19872.00	1.20	15.30	Low turbidity, clear, no odour, no sheen, minor black suspended sediments.
BW1	27/05/2024	6.69	20.70	8050.00	2.27	-156.10	Low turbidity, pale yellow, hydrogen sulfide odour, yellow suspended sediments.
	22/08/2024	6.28	19.10	18837.00	0.74	-144.50	Low turbidity, clear, black suspended sediments.
	7/11/2024	6.19	24.80	20045.00	2.05	75.00	Low turbidity (moderate turbidity towards bottom of hydrasleeve), clear-yellow, no odour, brown suspended sediments.
	6/02/2025	6.03	24.30	21268.00	1.18	-65.00	Low to moderate turbidity, grey-clear, hydrogen sulfide odour, no sheen, no suspended sediments.
	5/05/2025	6.15	20.10	25346.00	3.10	18.60	Low turbidity, clear, slight hydrogen sulfide odour, no sheen, no suspended sediments.
BW2A	27/05/2024	6.26	20.40	21410.00	0.86	-158.20	Moderate turbidity, brown, hydrogen sulfide odour, black and brown suspended sediments.
	22/08/2024	7.39	21.30	2771.00	3.33	27.00	Low to moderate turbidity, brown, decomposing organic odour, brown suspended sediments.
	7/11/2024	6.93	23.10	2316.00	1.85	-27.40	Low turbidity, clear-grey, slight hydrogen sulphide odour, grey-black suspended sediments.
	6/02/2025	7.60	22.00	2829.00	4.47	-5.60	Low turbidity, clear, no odour, no sheen, black suspended sediments.
	5/05/2025	7.56	25.40	3163.00	6.29	63.30	Moderate to high turbidity, brown, no odour, no sheen, brown suspended sediments.
BW2B	27/05/2024	6.98	20.60	3350.00	1.56	-202.00	Low turbidity, clear, slight hydrogen sulfide odour, no suspended sediments.
	22/08/2024	6.96	21.70	1808.00	1.61	-40.40	Low turbidity, clear, no odour, black grey suspended sediments.
	7/11/2024	7.48	23.40	3374.00	3.79	76.90	Low turbidity, clear-yellow, no odour, brown black suspended sediments.
	6/02/2025	7.05	24.70	2307.00	1.17	-94.30	Low turbidity, clear, no odour, no sheen, black suspended sediments.
	5/05/2025	7.02	23.60	2534.00	1.80	-60.00	Low turbidity, clear, slight hydrogen sulfide odour, no sheen, black suspended sediments.
BW4A	28/05/2024	6.90	18.80	9280.00	2.01	143.80	High turbidity, orange-grey, no odour, orange grey suspended sediments.
	22/08/2024	7.09	18.30	13745.00	1.69	110.80	High turbidity, orange, no odour, orange-brown suspended sediments.
	7/11/2024	7.25	21.60	13314.00	1.60	73.50	Moderate to high turbidity, orange, no odour, orange suspended sediments.
	6/02/2025	6.79	26.80	11020.00	0.38	57.90	High turbidity, brown, hydrogen sulfide odour, no sheen, brown suspended sediments.
	5/05/2025	6.94	22.90	18958.00	1.71	135.80	Moderate turbidity, clear to brown with black top layer, slight hydrogen sulfide odour, no sheen, brown suspended sediments.
BW4B	28/05/2024	6.55	20.00	17760.00	1.36	44.50	Moderate turbidity, pale beige, no odour, pale beige suspended sediments.
	22/08/2024	6.53	19.20	18330.00	0.95	7.50	Moderate to high turbidity, brown-grey, hydrogen sulphide odour, brown-grey-orange suspended sediments.
	7/11/2024	6.61	19.80	18763.00	0.76	80.70	low to moderate turbidity, light-brown-clear, slight hydrogen sulphide odour, brown suspended sediments.
	6/02/2025	6.52	27.70	9876.00	3.10	-28.20	Moderate turbidity, grey-brown, slight hydrogen sulfide odour, no sheen, brown suspended sediments.
	5/05/2025	6.66	21.00	20303.00	0.64	-19.40	Moderate turbidity, light brown, no odour, no sheen, no suspended sediments.
BW5A	28/05/2024	6.84	17.10	22330.00	1.96	49.70	Moderate turbidity, no odour, clear to pale brown towards bottom of hydrasleeve, grey suspended sediments.
	22/08/2024	7.06	19.70	15913.00	0.28	-69.20	Low turbidity, clear, no odour, grey suspended sediments.
	7/11/2024	6.66	21.40	26065.00	1.07	34.20	Low to moderate turbidity, clear-brown, no odour, brown suspended sediments.
	6/02/2025	6.59	24.40	22283.00	1.29	23.20	Moderate to high turbidity, brown-black, no odour, no sheen, black suspended sediments.
	5/05/2025	6.61	22.60	24330.00	7.99	-115.70	Low turbidity, clear, hydrogen sulfide odour, no sheen, brown suspended sediments.
BW5B	28/05/2024	6.97	17.40	11160.00	1.36	-21.70	Low turbidity, clear, no odour, no suspended sediments.
	22/08/2024	6.59	20.40	25653.00	0.88	19.50	High turbidity, brown, no odour, brown-grey suspended sediments.
	7/11/2024	7.23	21.70	17006.00	1.06	31.10	Low turbidity, clear, soil-like odour, minor-brown suspended sediments.
	6/02/2025	6.92	25.80	14967.00	1.24	-87.50	Low turbidity, clear, no odour, no sheen, minor brown suspended sediments.
	5/05/2025	6.84	22.60	17939.00	2.05	-107.90	Low turbidity, clear, hydrogen sulfide odour, no sheen, no suspended sediments.
µS = microsiemens cm = centimetres mg = milligram L = Litre mV = millivolts							

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub
Badgerys Creek, NSW
Quarter Ending May 2024



Document Information

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending May 2024

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by PGH Bricks & Pavers Pty Limited (PGH) to complete a Noise Monitoring Assessment (NMA) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW.

This assessment has been undertaken for the quarterly period ending May 2024, and forms part of the annual noise monitoring program to address conditions outlined in the Consolidated Consent PA 10_0014 (the Consent) and Environmental Protection Licence #684 (EPL) noise limits.

The NMA has quantified potential operational noise emissions from the operation and has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL #684 (EPL), October 2023;
- Badgerys Creek Brick Quarry and Brick Making Project Noise Management Plan (BRK-BAD-Noise Management Version 7, 21/12/2023);
- NSW Government Department of Planning and Environment, Project Approval (PA) 10_0014, January 2022; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

CSR Advanced Manufacturing Hub is located at 235 Martin Road, Badgerys Creek, NSW. Receivers in the locality surrounding the site are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from the EPL (#684). The monitoring locations with respect to CSR are presented in the locality plan shown in **Figure 1**.

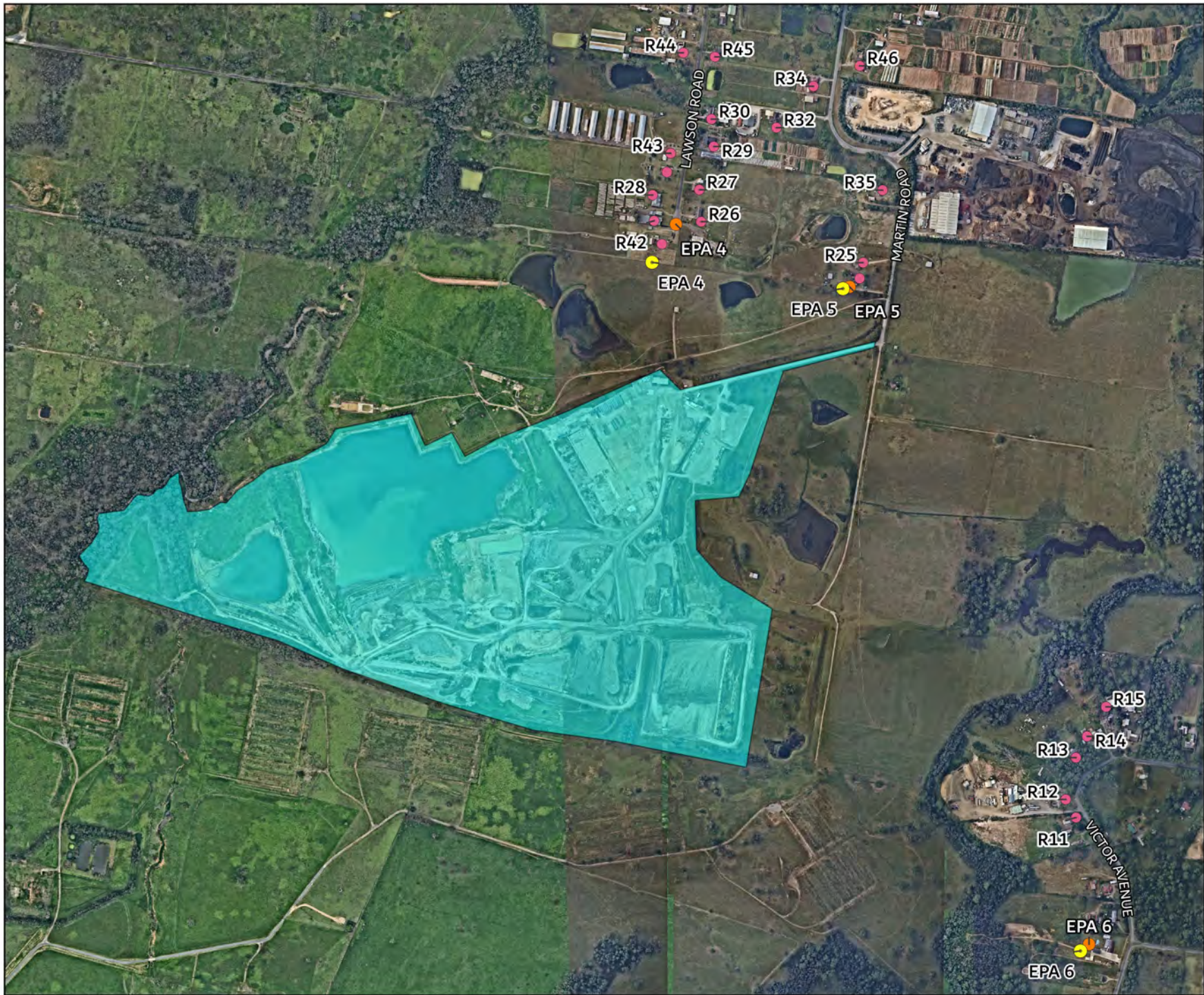


FIGURE 1
LOCALITY PLAN
MAC221719-01
CSR Advanced
Manufacturing Hub
Badgerys Creek, NSW

KEY

-  Site Boundary
-  Unattended Monitor Locations
-  Attended Monitoring Locations
-  Consent Locations



2 Noise Criteria

Section L4 of the projects EPL (EPL #684) outlines the applicable operational noise criteria for all privately owned receivers surrounding the project. The criteria outlined in the EPL is reproduced below in **Table 1** along with relevant noise conditions:

L4.1 Noise from the premises (excluding mobile plant) must not exceed:

- a) *An LA₁₀ (15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) *An LA₁₀ (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.2 Noise from the operation of mobile plant must not exceed:

- a) *An LA₁₀ (15 minute) noise emission criterion of 50 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) *An LA₁₀ (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 meters from the residence, at the most affected point within 30 meters of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

Table 1 EPL Noise Criteria¹

Receiver	Location Description	Time Period	Noise Level Parameter	
			dB LAeq (15min)	dB LAF (max)
EPA Point 4	255 Lawson Road, Badgerys Creek, 2555	Morning Shoulder	42	N/A
		Day	42	N/A
		Evening	41	N/A
		Night	38	52
EPA Point 5	217 Martin Road, Badgerys Creek, 2555	Morning Shoulder	43	N/A
		Day	45	N/A
		Evening	40	N/A
		Night	38	52
EPA Point 6	50 Victor Avenue, Kemps Creek, 2178	Morning Shoulder	43	N/A
		Day	43	N/A
		Evening	43	N/A
		Night	38	52

Note 1: Noise criteria adopted from the EPL (EPL #684).

L4.5 For the purpose of the condition above:

- a) *Morning shoulder means the period from 5am and 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.*
- b) *Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.*
- c) *Evening means the period from 6pm to 10pm.*
- d) *Night means the period from 10pm to 5am Monday to Saturday and the period from 10pm to 5am Sunday and public holidays.*

The Badgerys Creek Brick Quarry and Brick Making Project NMP outlines the applicable noise criteria for representative residential receivers surrounding the site and are presented in **Table 2**. The site includes the operation of a quarry and brickmaking plant, there are separate criteria relating to each period.

Table 2 Consolidated Consent Noise Criteria ¹					
Receiver (EPA Reference)	Morning Shoulder	Day	Evening	Night ²	
	dB LAeq(15min)			dB LA1(max) ³	
R9, R25, R35 (EPA Point 5)	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46 (EPA Point 4)	42	42	41	38	52
R11, R12, R13, R14, R15 (EPA Point 6)	43	43	43	38	52
All other residences	N/A	40	35	35	52

Note 1: Noise criteria adopted from the Consolidated Consent.

Note 2: Monitoring periods are defined in Section L4.5 of the EPL #684

Note 3: Periods and parameters as expressed in the Consolidated Consent.

Figure 1 presents the identified receiver locations and representative measurement locations.

3 Methodology

3.1 Unattended Assessment Methodology

The unattended noise survey was conducted in general accordance with the procedures described in Australian Standard AS 1055:2018, "Acoustics – Description and Measurement of Environmental Noise".

The measurements were carried out using two Svantek 977 noise analysers and one Svantek 958 noise analyser from Tuesday 12 March 2024 to Tuesday 19 March 2024. The acoustic instrumentation used carries current NATA calibration and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$. All equipment carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per the EPA's Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022).

To quantify the existing background noise environment of the area, unattended noise monitors were installed at three (3) locations (EPA 4, EPA 5, EPA 6) representative of the ambient environment surrounding the project site.

Unattended data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI. The measured daily Ambient Background Levels (ABLs) along with summary results for the background monitoring are provided in **Section 5.1**. The long-term unattended noise monitoring charts are provided in **Appendix B**.

3.2 Operator Attended Noise Monitoring

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022). Attended measurements were conducted using a Svantek Type 1, 971 noise analyser. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Attended noise measurements were of 15-minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at three (3) locations (EPA 4, EPA 5, EPA 6) on Wednesday 20 March 2024 during the day period to satisfy the requirements of the NMP and EPL. Attended measurements were not conducted during the evening and night periods due to the site not operating between the hours of 6pm and 7am.

Extraneous noise sources were excluded from the attended analysis to determine the $\text{LA}_{\text{eq}}(15\text{min})$ site noise contribution for comparison against the relevant criteria. In the event of site attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the site is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

4 Results

4.1 Unattended Noise Monitoring Results

The results of long-term unattended noise monitoring are provided in **Table 3**, **Table 4** and **Table 5**. The noise monitoring charts for the background monitoring assessment are provided in **Appendix B**. Data affected by adverse meteorological conditions have been excluded from the results in accordance with methodologies provided in Fact Sheet A4 of the NPI.

Table 3 Background Noise Monitoring Summary – EPA 4

Date	Measured Background Noise Level (LA90) dB ABL ¹			Measured Ambient Noise Level dB LAeq(period)		
	Day	Evening	Night	Day	Evening	Night
Tuesday 12 March 2024	N/A	35	35	N/A	47	47
Wednesday 13 March 2024	33	34	36	52	40	44
Thursday 14 March 2024	35	34	34	52	46	49
Friday 15 March 2024	38	36	31	50	45	44
Saturday 16 March 2024	33	35	33	50	45	49
Sunday 17 March 2024	28	36	34	55	45	43
Monday 18 March 2024	33	35	36	45	43	45
Tuesday 19 March 2024	34	33	39	45	41	46
EPA 4 – RBL / Leq Overall	34	35	35	51	45	46

Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

Note 2: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Badgerys Creek AWS Site 67108.

Note 3: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 4 Background Noise Monitoring Summary – EPA 5

Date	Measured Background Noise Level (LA90) dB ABL ¹			Measured Ambient Noise Level dB LAeq(period)		
	Day	Evening	Night	Day	Evening	Night
Tuesday 12 March 2024	N/A	39	39	N/A	45	52
Wednesday 13 March 2024	37	39	39	50	53	52
Thursday 14 March 2024	38	41	45	57	51	57
Friday 15 March 2024	41	43	38	51	51	54
Saturday 16 March 2024	36	40	39	49	48	59
Sunday 17 March 2024	36	40	40	48	55	53
Monday 18 March 2024	37	39	40	50	54	52
Tuesday 19 March 2024	38	39	41	51	48	50
EPA 5 – RBL / Leq Overall	37	40	40	52	52	55

Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

Note 2: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Badgerys Creek AWS Site 67108.

Note 3: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Table 5 Background Noise Monitoring Summary – EPA 6

Date	Measured Background Noise Level (LA90) dB ABL ¹			Measured Ambient Noise Level dB LAeq(period)		
	Day	Evening	Night	Day	Evening	Night
Tuesday 12 March 2024	N/A	41	38	N/A	49	48
Wednesday 13 March 2024	36	40	40	53	47	49
Thursday 14 March 2024	40	40	38	50	54	47
Friday 15 March 2024	38	41	34	48	50	42
Saturday 16 March 2024	36	40	37	48	49	49
Sunday 17 March 2024	33	40	39	46	53	50
Monday 18 March 2024	36	43	40	47	50	49
Tuesday 19 March 2024	37	42	42	55	50	49
EPA 6 – RBL / Leq Overall	37	41	38	60	51	48

Note 1: Assessment background level (ABL) – the single-figure background level representing each assessment period day, evening and night as per NPI Fact Sheet A.

Note 2: Excludes periods of wind or rain affected data. Meteorological data obtained from the Bureau of Meteorology weather station Badgerys Creek AWS Site 67108.

Note 3: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.2 Prevailing Meteorological Conditions

Weather data for the noise assessment period was sourced from Badgerys Creek AWS Site 67108 as well as operator observations at each measurement location. The data was used to determine prevailing meteorological conditions at the time of the attended measurements. Meteorological data is presented in **Table 6** and are generally below levels where noise limits are applicable. Furthermore, wind speed at the microphone height satisfies requirements of Fact Sheet A of the NPI.

Table 6 Prevailing Meteorological Conditions

Date & Time	Badgerys Creek AWS Site 67108 (10m AGL)		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
20/03/2024 13:03	SW	1.9	S	0.3
20/03/2024 13:39	SSW	1.6	S	1.5
20/03/2024 14:07	SW	2.4	S	1.2

4.3 Assessment Results - Location EPA 4

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location EPA 4 for the NMA are presented in **Table 7**.

Table 7 Operator-Attended Noise Survey Results - Location EPA 4

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}		
20/03/2024	14:07 (Day)	99	87	60	40	74	WD: S WS: 1.2m/s Rain: Nil	Dog bark 48-99
								Industrial noise 44-52
								Aircraft 42-67
								Birds 42-52
								Insects <40
								Residential noise <40
								CSR operations 38-42 (trucks and mobile plant) (8 minutes)
CSR Site L _{Aeq} (15min) Contribution								37

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.4 Assessment Results - Location EPA 5

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location EPA 5 for the NMA are presented in **Table 8**.

Table 8 Operator-Attended Noise Survey Results - Location EPA 5

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}		
20/03/2024	13:03 (Day)	65	56	50	42	47	WD: S WS: 0.3m/s Rain: Nil	Dog bark 48-61
								Insects 40-54
								Birds 44-65
								Aircraft 43-55
								Industrial noise 42-52
								Traffic 45-54
								CSR operations 41-45 (trucks and mobile plant)
								(10 minutes)
CSR Site L _{Aeq} (15min) Contribution								41

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5 Assessment Results - Location EPA 6

The monitored noise level contributions and observed meteorological conditions for each assessment period at Location EPA 6 for the NMA are presented in **Table 9**.

Table 9 Operator-Attended Noise Survey Results - Location EPA 6

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}		
20/03/2024	13:39 (Day)	84	56	51	43	52	WD: S WS: 1.5m/s Rain: Nil	Insects 42-45
								Aircraft 44-61
								Traffic 41-49
								Dog bark 48-84
								Birds 43-48
								Industrial noise 45-57
								Residential noise 41-43
								CSR inaudible
								CSR Site L _{Aeq} (15min) Contribution
<33								

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

5.1 Assessment Results - Location EPA 4

Monitoring on Wednesday 20 March 2024 identified that CSR activities were audible for approximately eight (8) minutes during the measurement period at location EPA 4. CSR activities were inclusive of truck and mobile plant movements. The site contribution was estimated to be below the relevant noise limits during the assessed day period.

CSR was not operational during the evening or night periods, therefore noise measurements were not conducted. Extraneous sources such as dogs barking, other industrial noise, aircraft, birds, insects, and local residential noise were audible during the measurement period.

5.2 Assessment Results - Location EPA 5

Monitoring on Wednesday 20 March 2024 identified that CSR activities were audible for approximately 10 minutes during the measurement period at location EPA 5. CSR activities were inclusive of truck and mobile plant movements. The site contribution was estimated to be below the relevant noise limits during the assessed day period.

CSR was not operational during the evening or night periods, therefore noise measurements were not conducted. Extraneous sources such as dogs barking, insects, birds, aircraft, other industrial noise, and traffic were audible during the measurement period.

5.3 Assessment Results - Location EPA 6

Monitoring on Wednesday 20 March 2024 identified that CSR activities were inaudible during the measurement period at location EPA 6. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

CSR was not operational during the evening or night periods, therefore noise measurements were not conducted. Extraneous sources such as insects, aircraft, traffic, dogs barking, birds, other industrial noise and local residential noise were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) commissioned by PGH Bricks & Pavers Pty Limited (PGH) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW. The assessment was completed to assess the site's compliance with the relevant noise criteria during the quarter period ending May 2024.

Operator attended noise monitoring was undertaken on Wednesday 20 March 2024 at three (3) representative receiver locations. The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

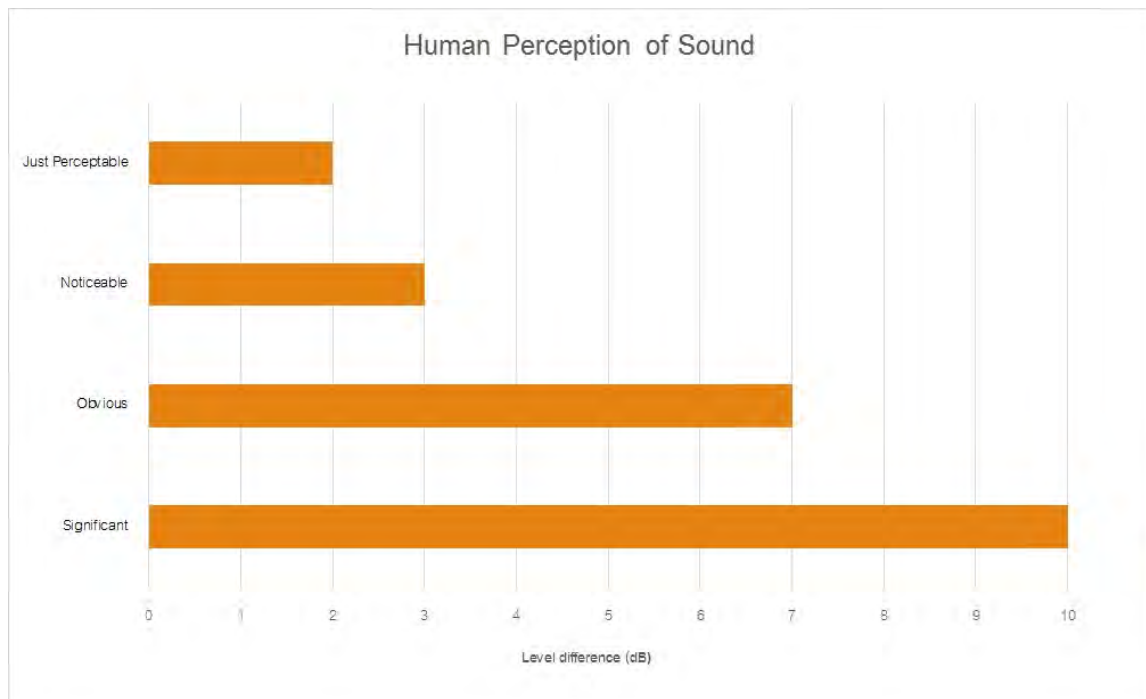
Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



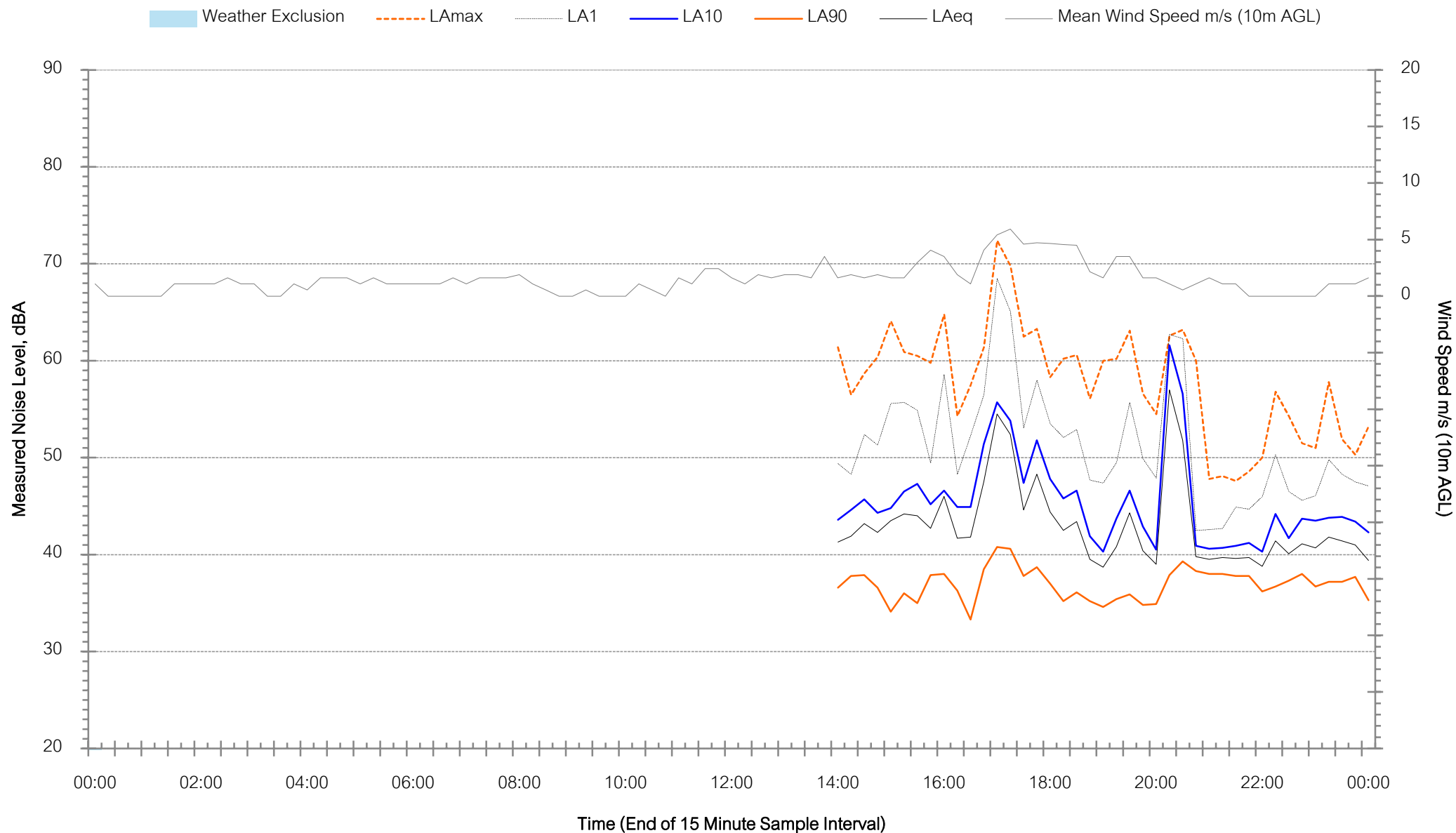
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Appendix B – Unattended Noise Monitoring Charts



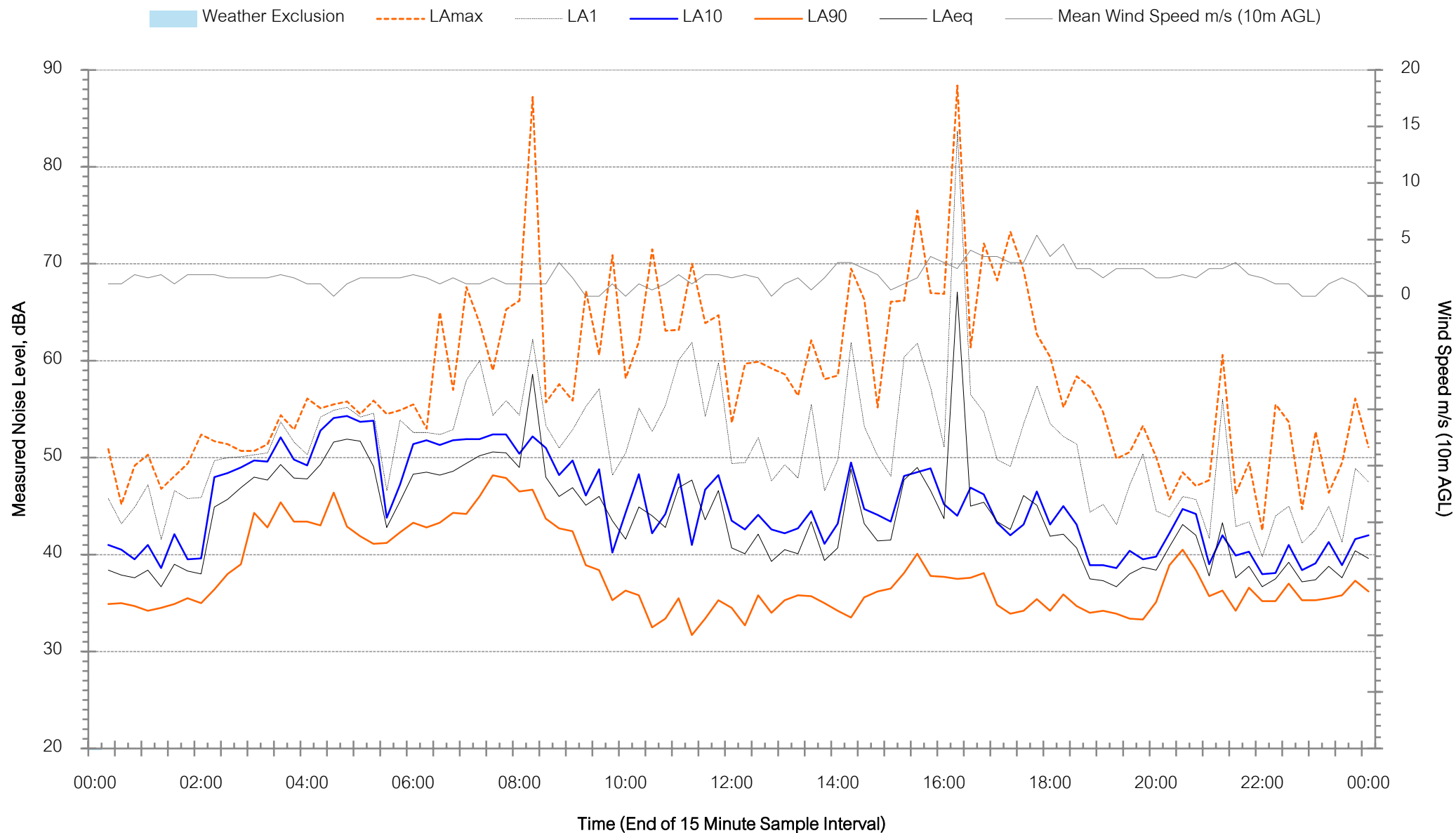
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Tuesday 12 March 2024



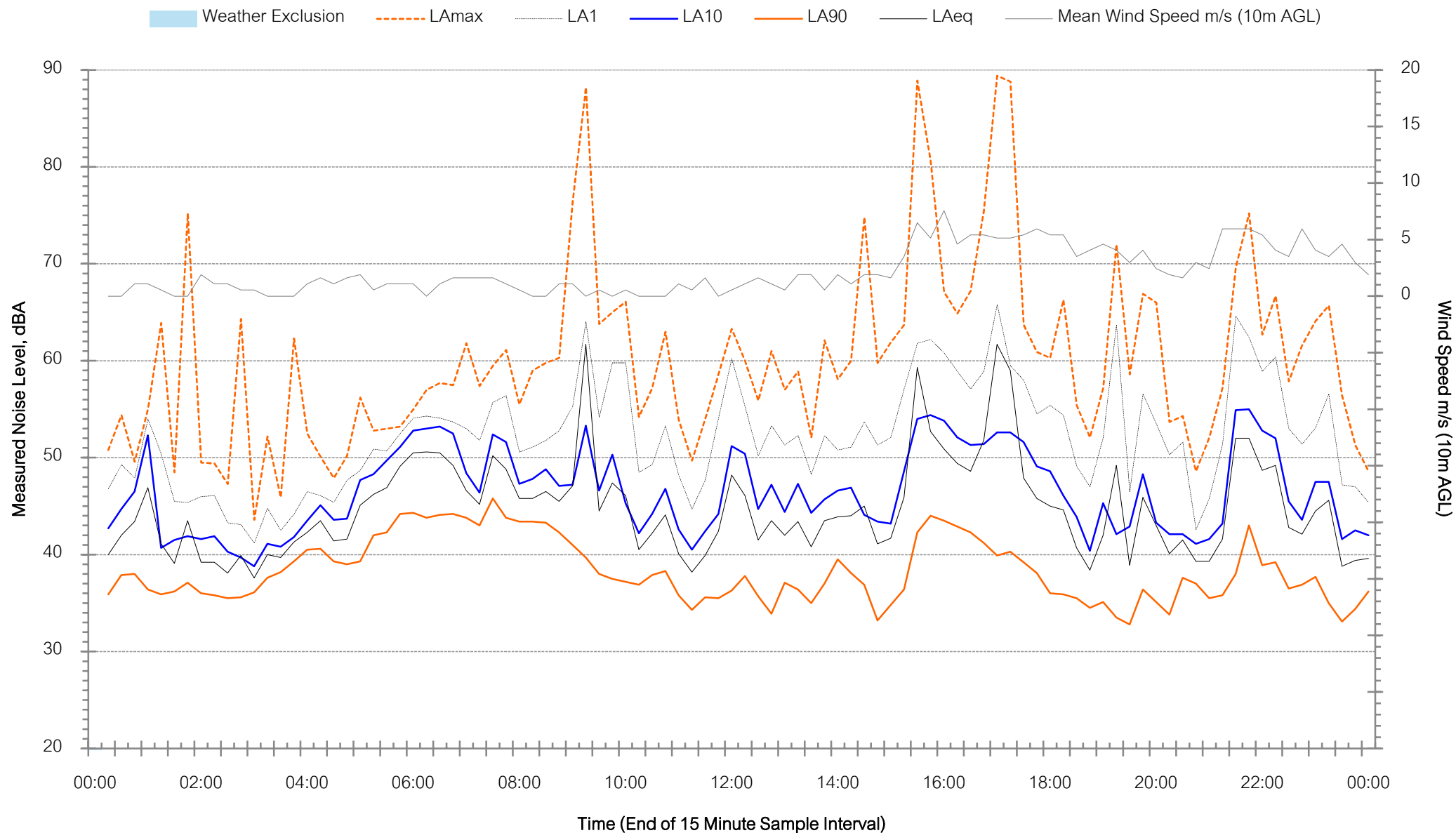
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Wednesday 13 March 2024



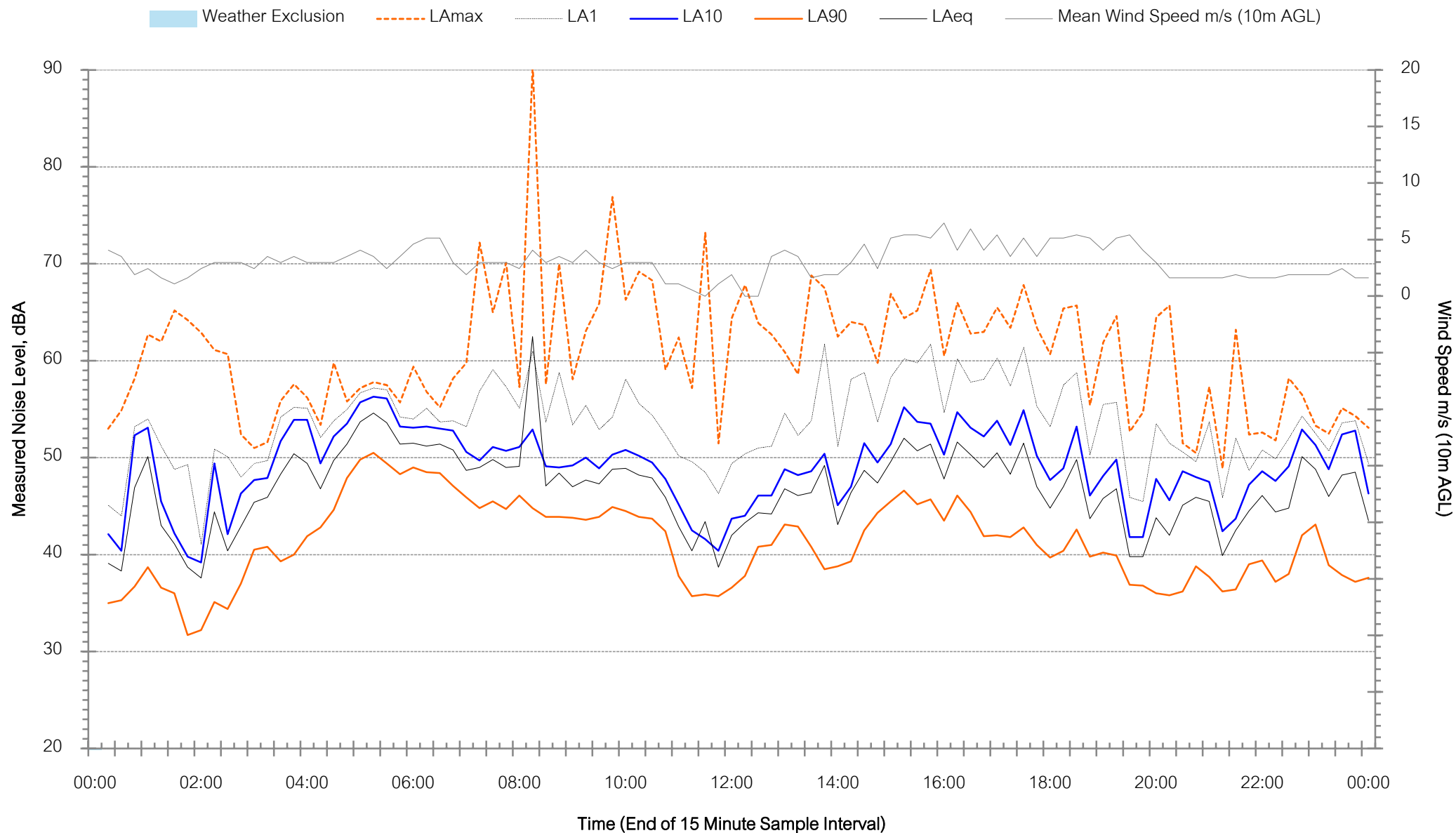
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Thursday 14 March 2024



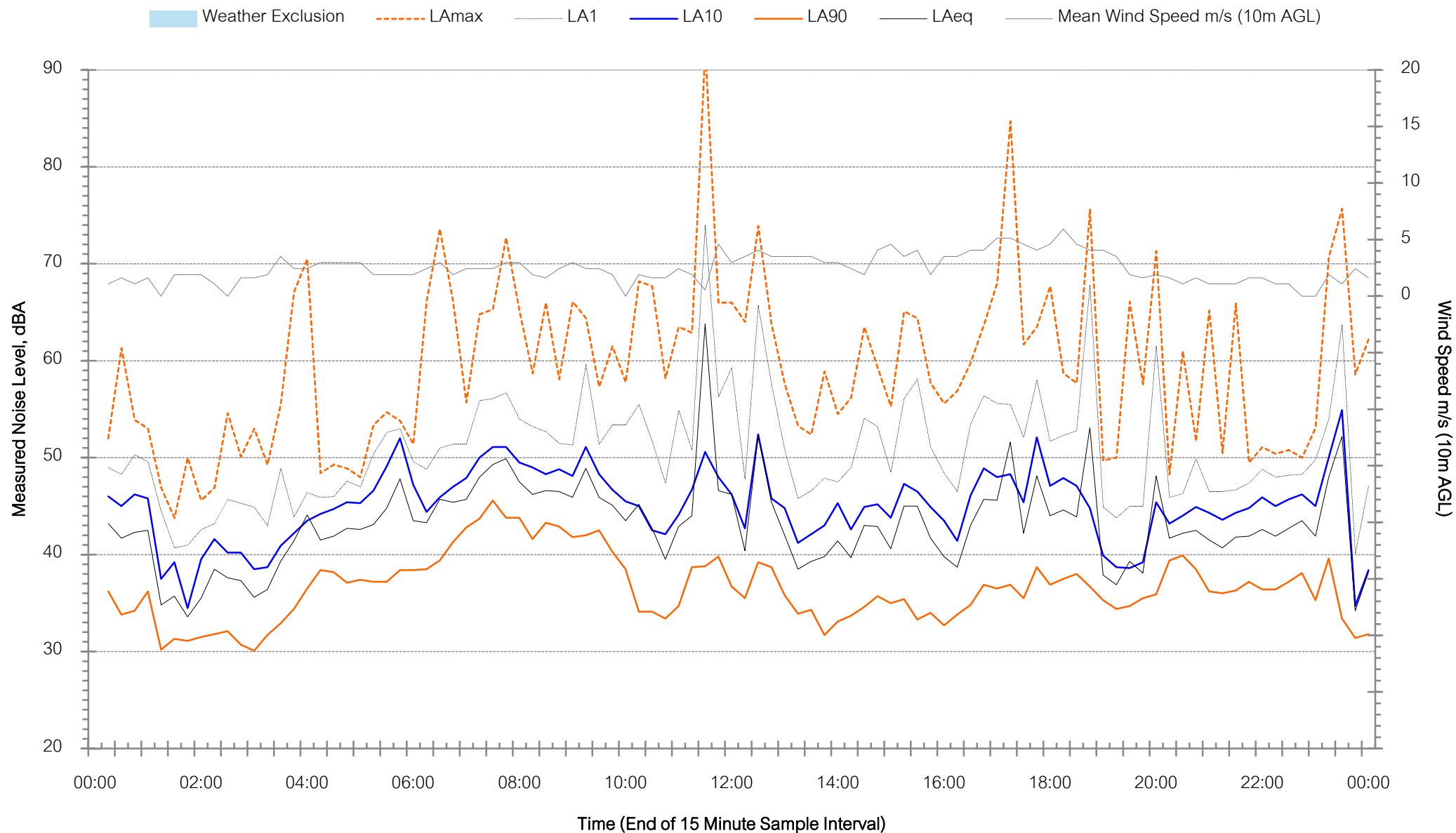
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Friday 15 March 2024



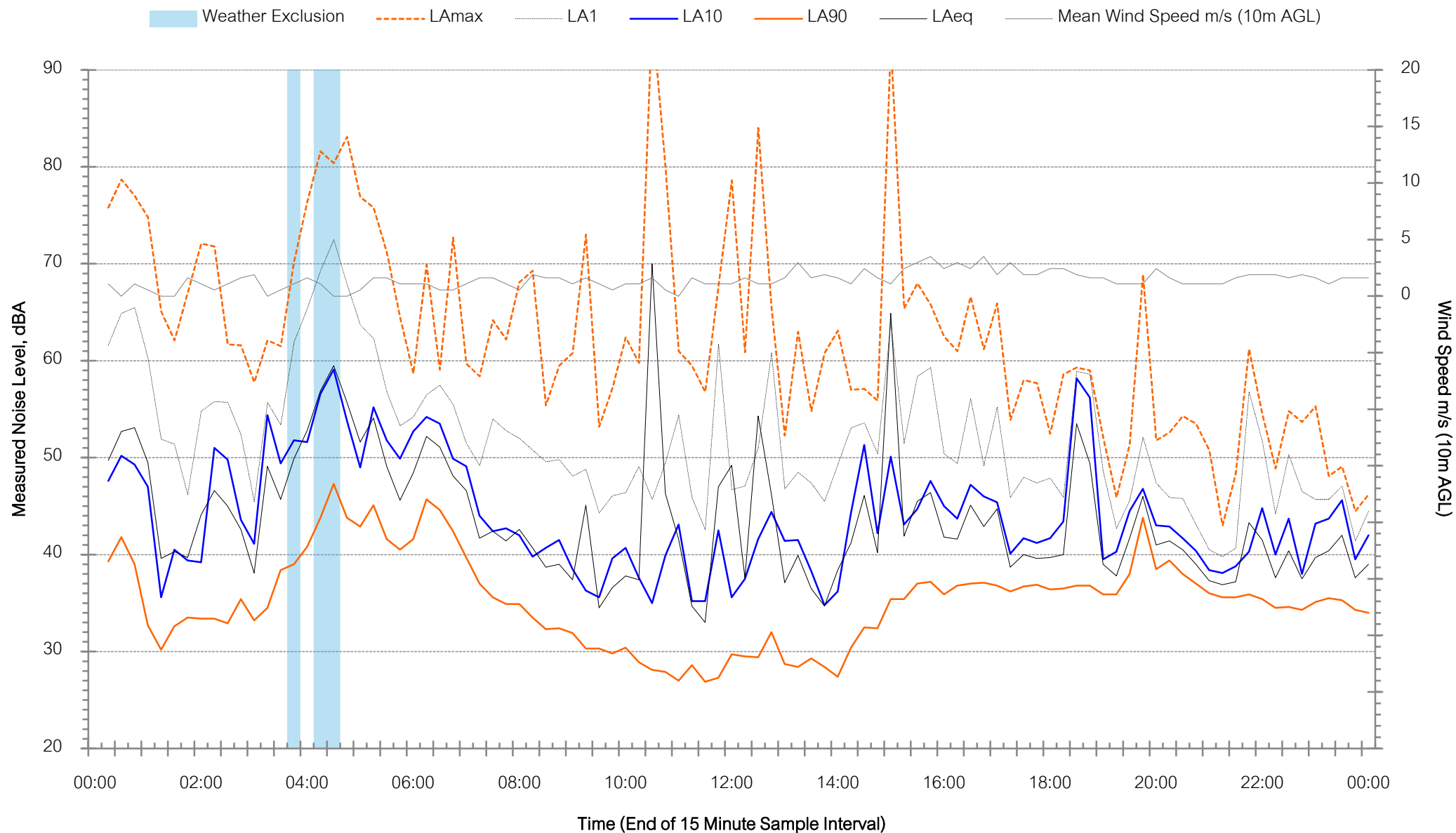
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Saturday 16 March 2024



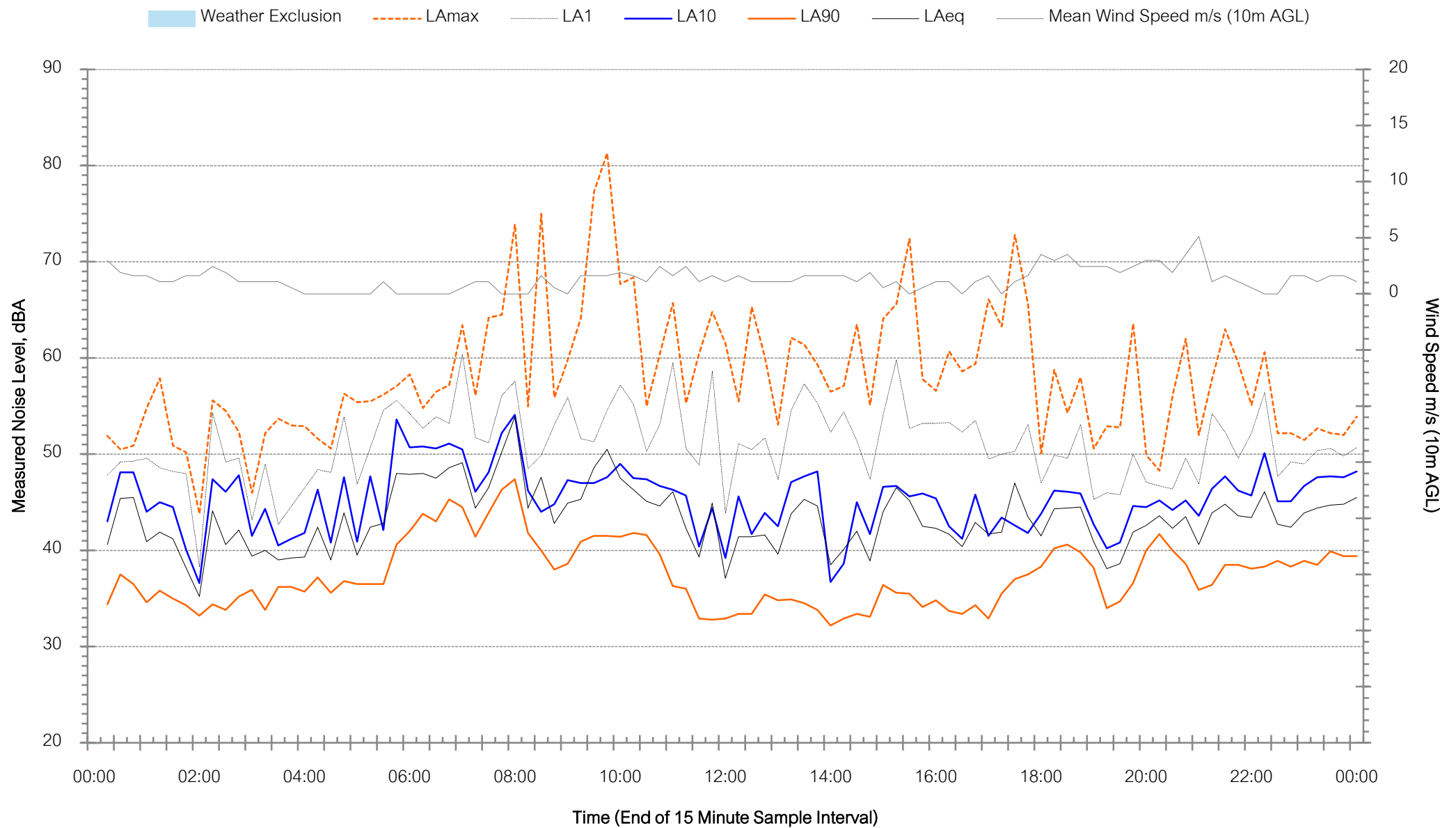
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Sunday 17 March 2024



Background Noise Levels

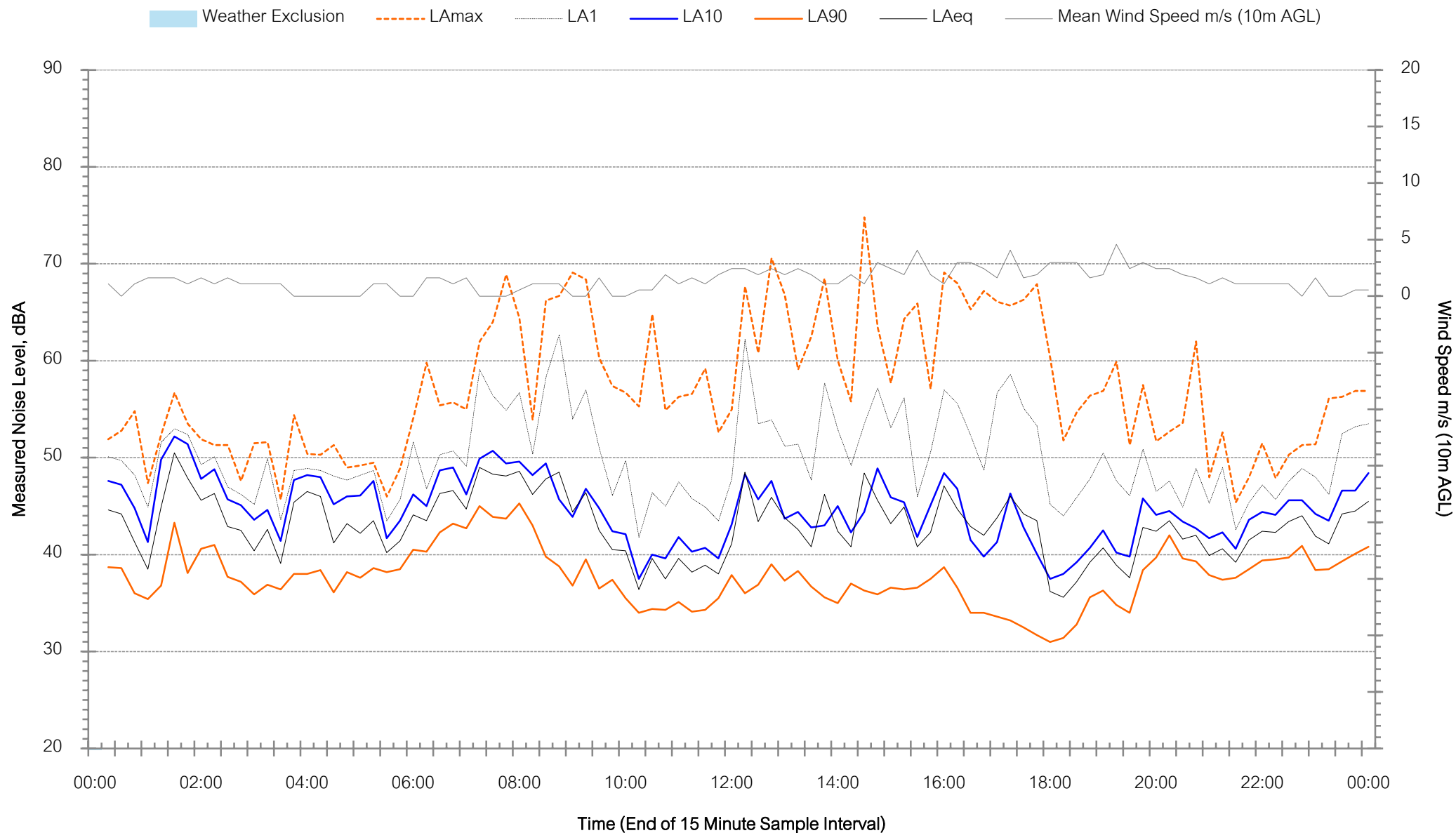
255 Lawson Road, Badgerys Creek (EPA 4) - Monday 18 March 2024





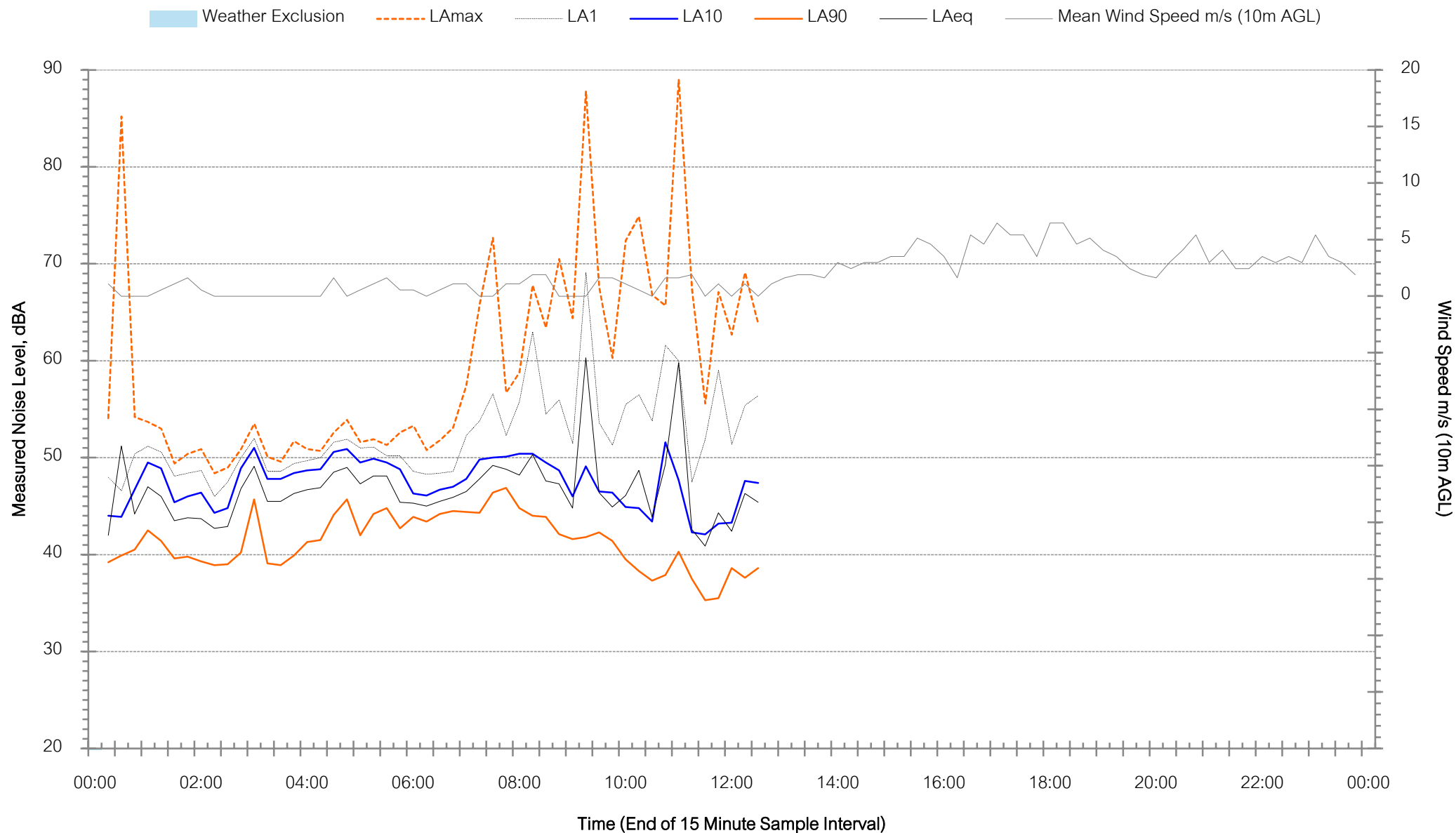
Background Noise Levels

255 Lawson Road, Badgerys Creek (EPA 4) - Tuesday 19 March 2024



Background Noise Levels

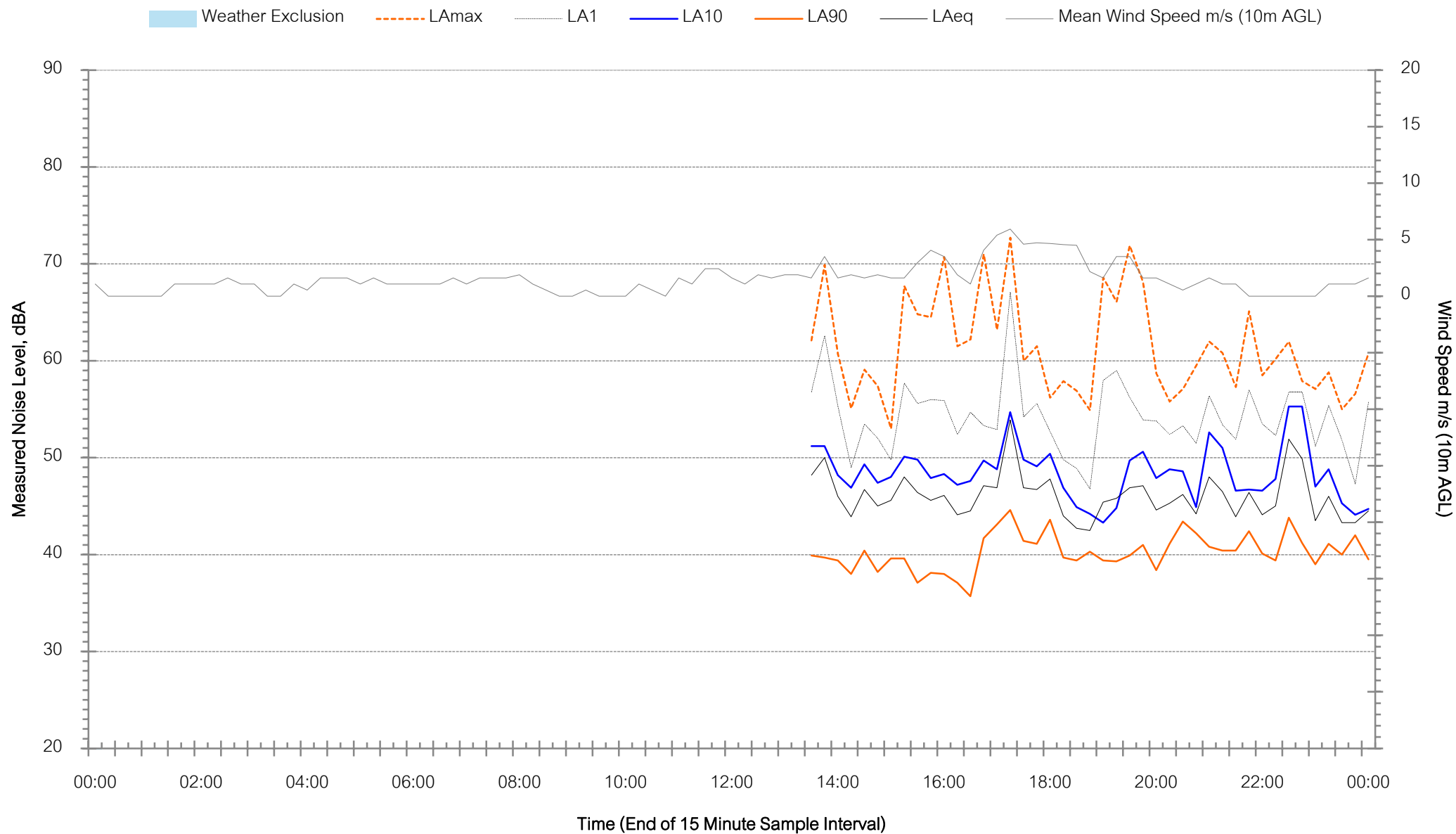
255 Lawson Road, Badgerys Creek (EPA 4) - Wednesday 20 March 2024





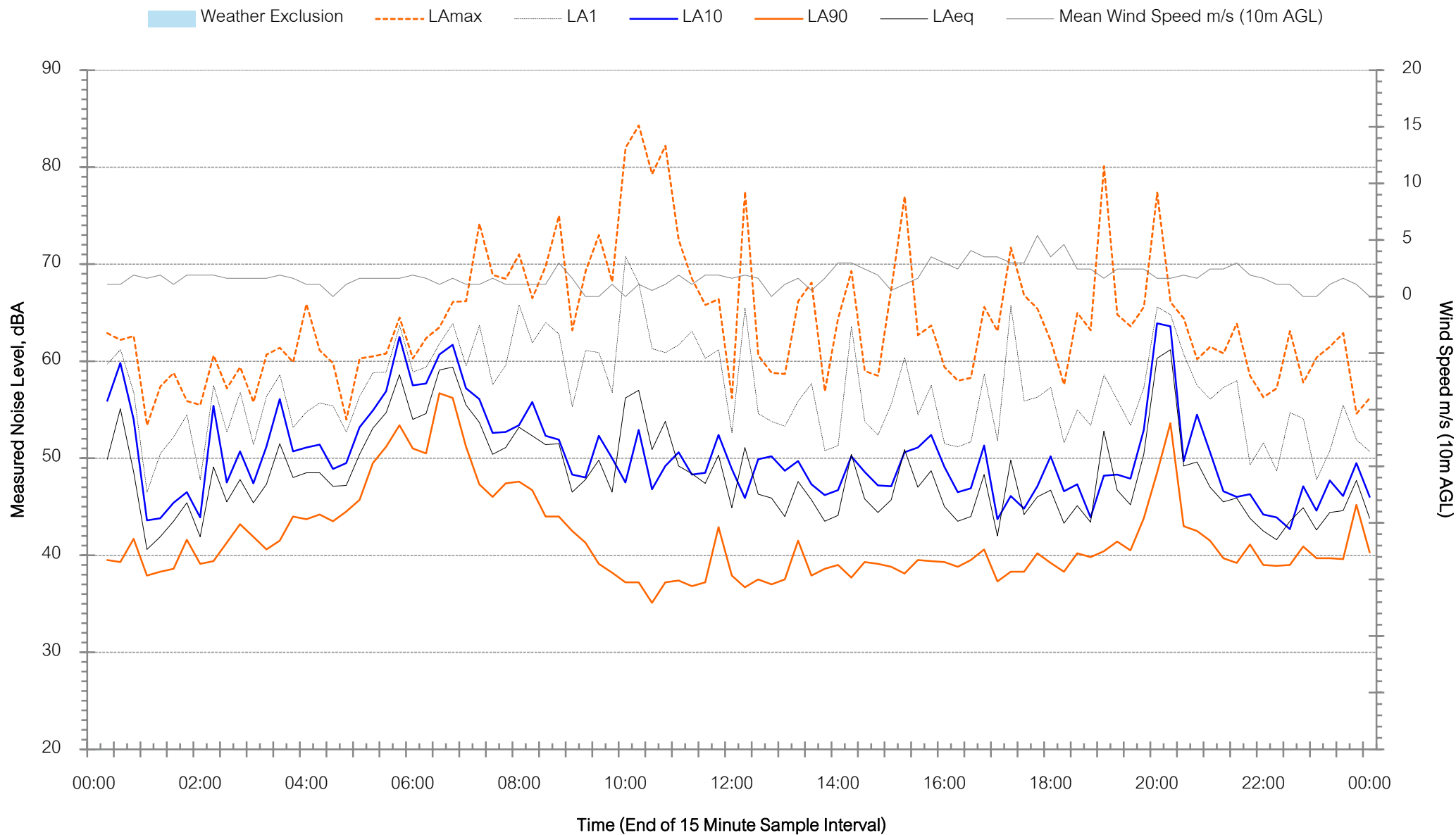
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Tuesday 12 March 2024



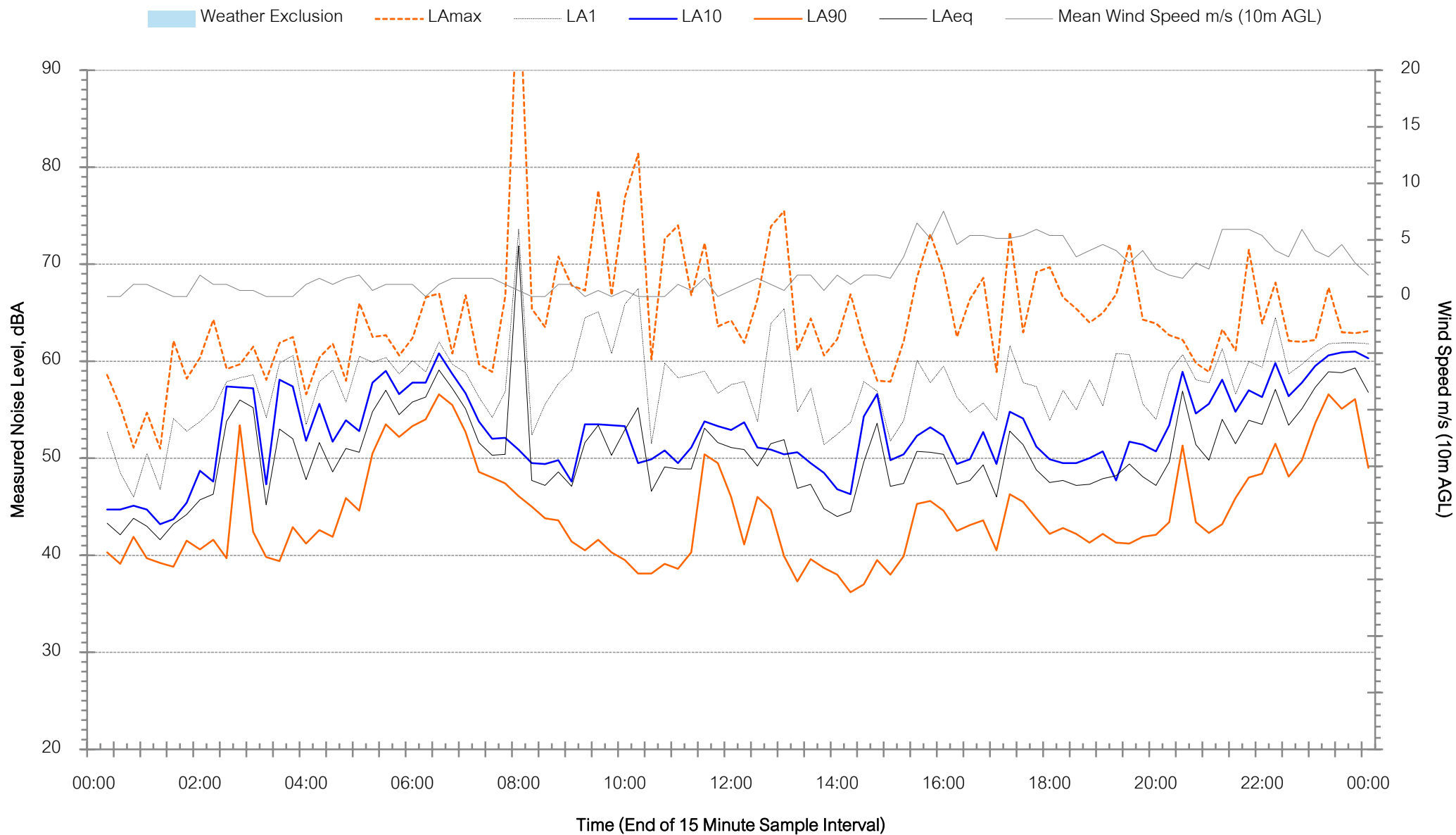
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Wednesday 13 March 2024



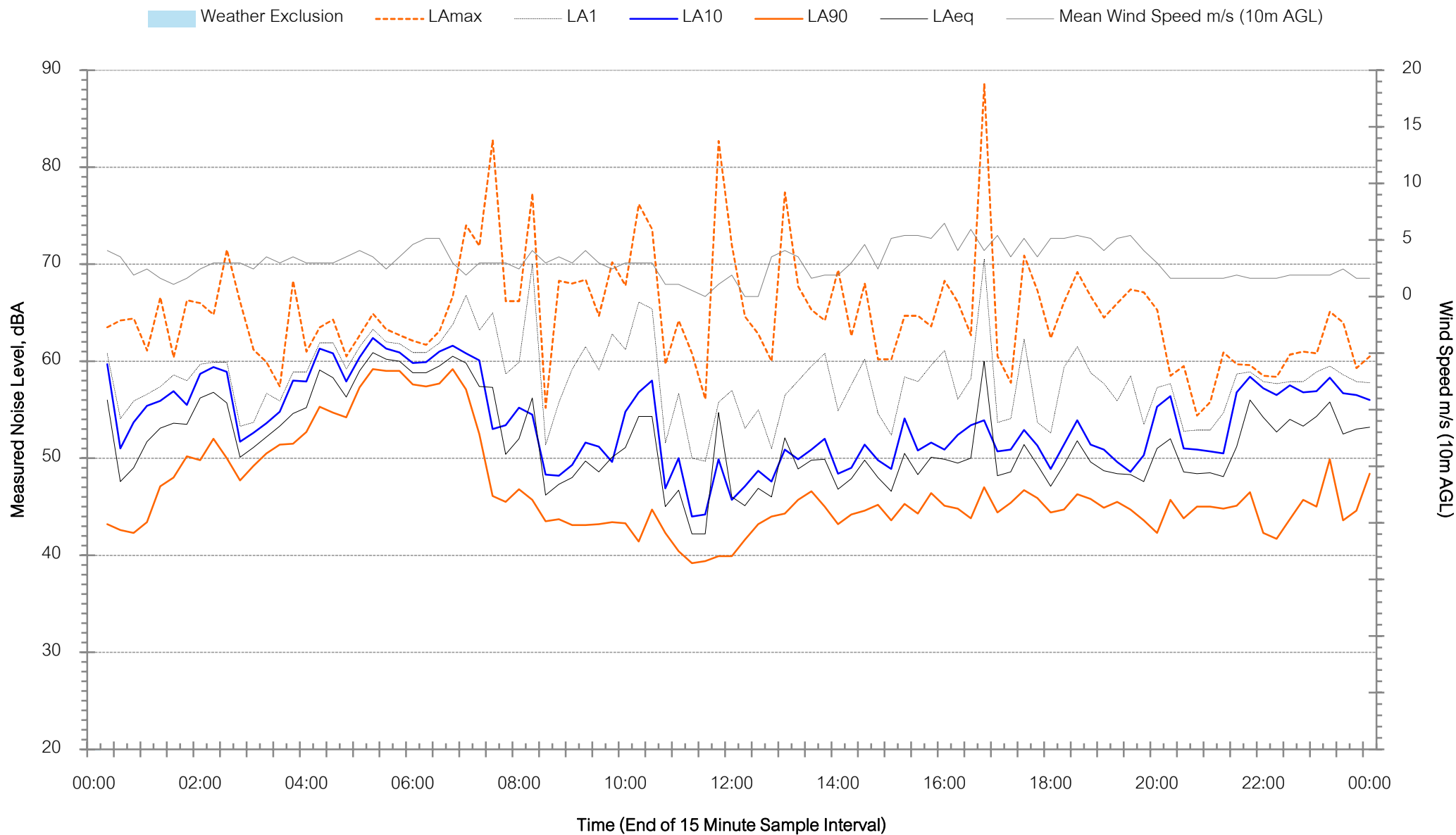
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Thursday 14 March 2024



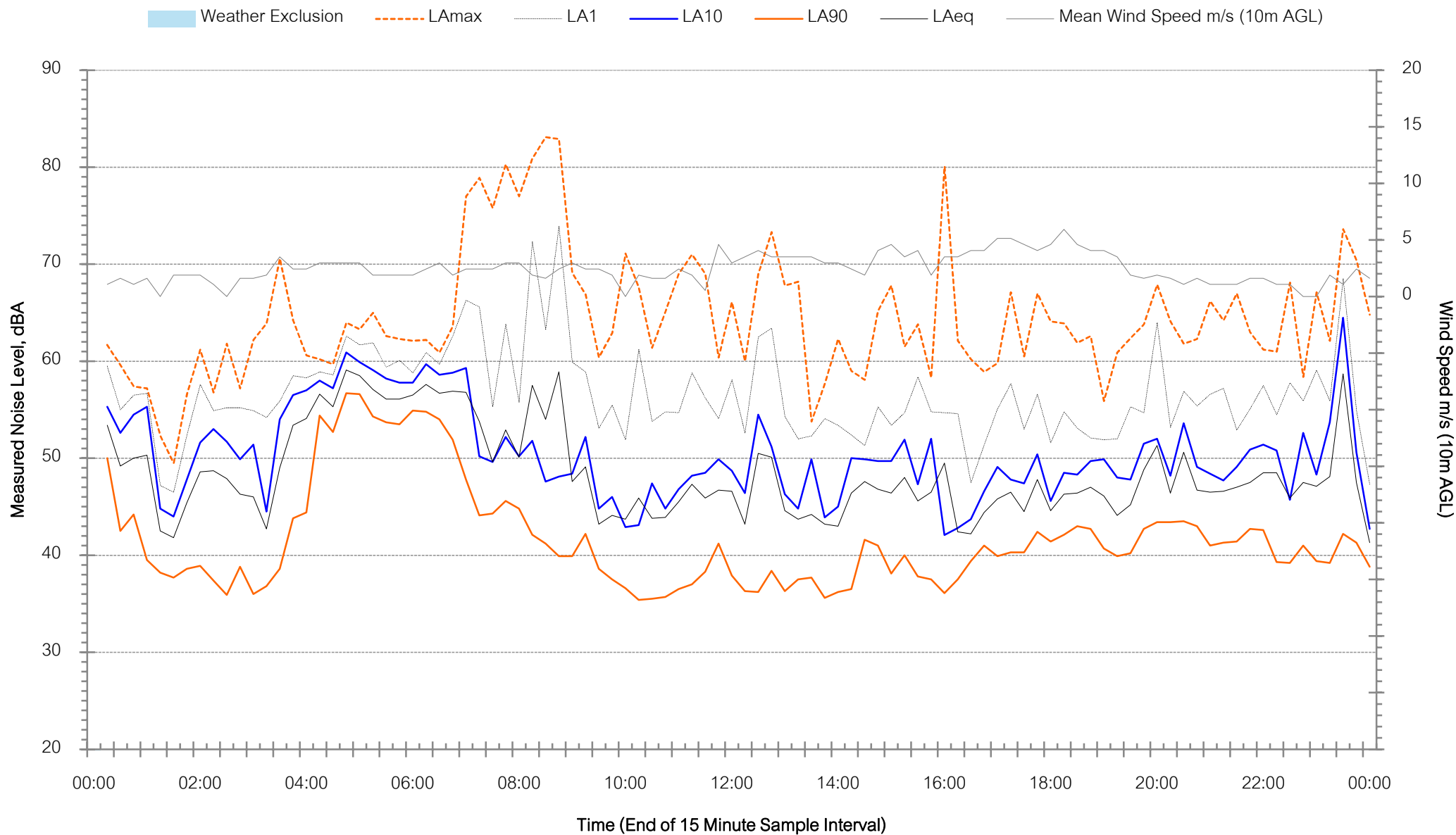
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Friday 15 March 2024



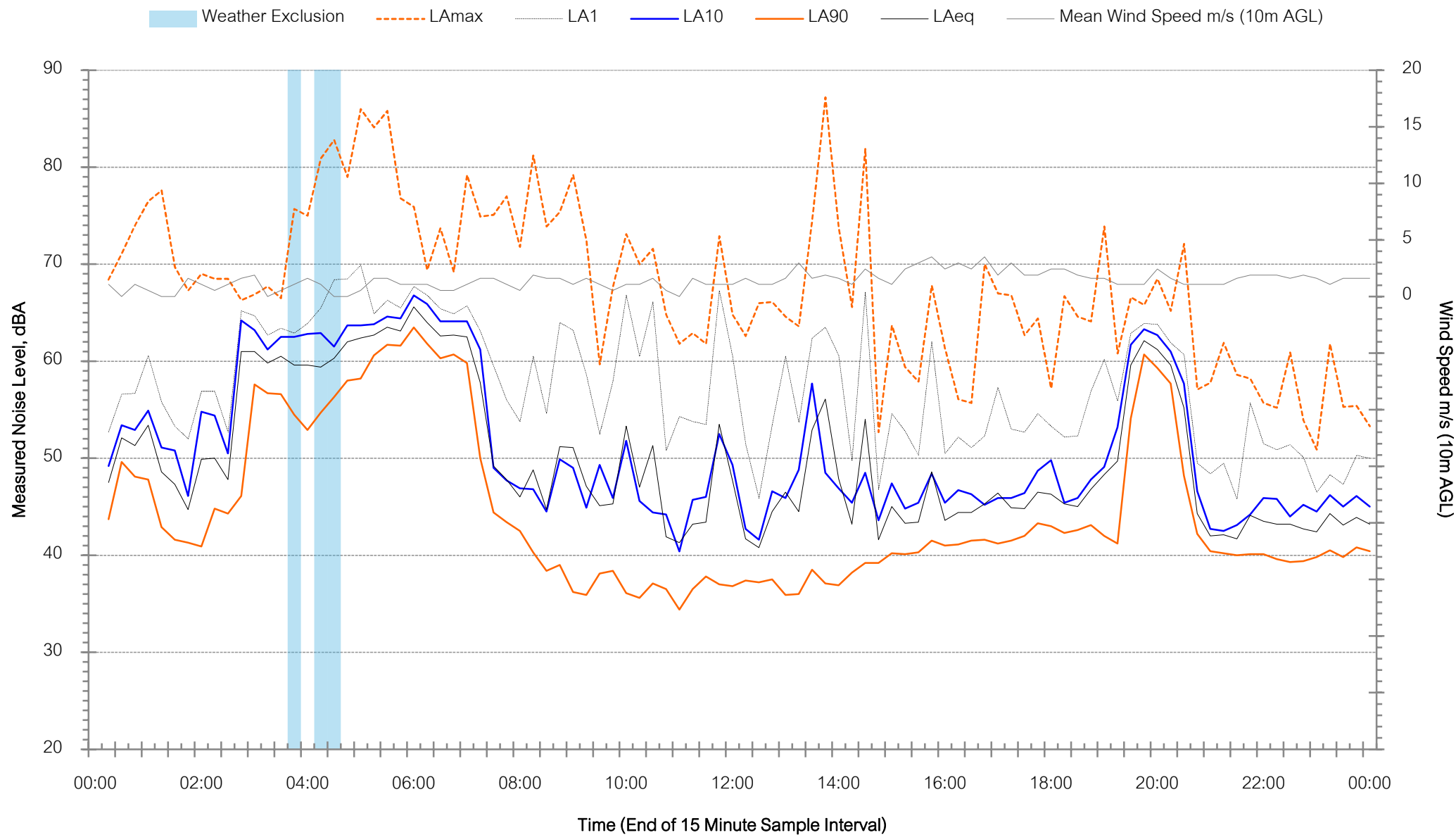
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Saturday 16 March 2024



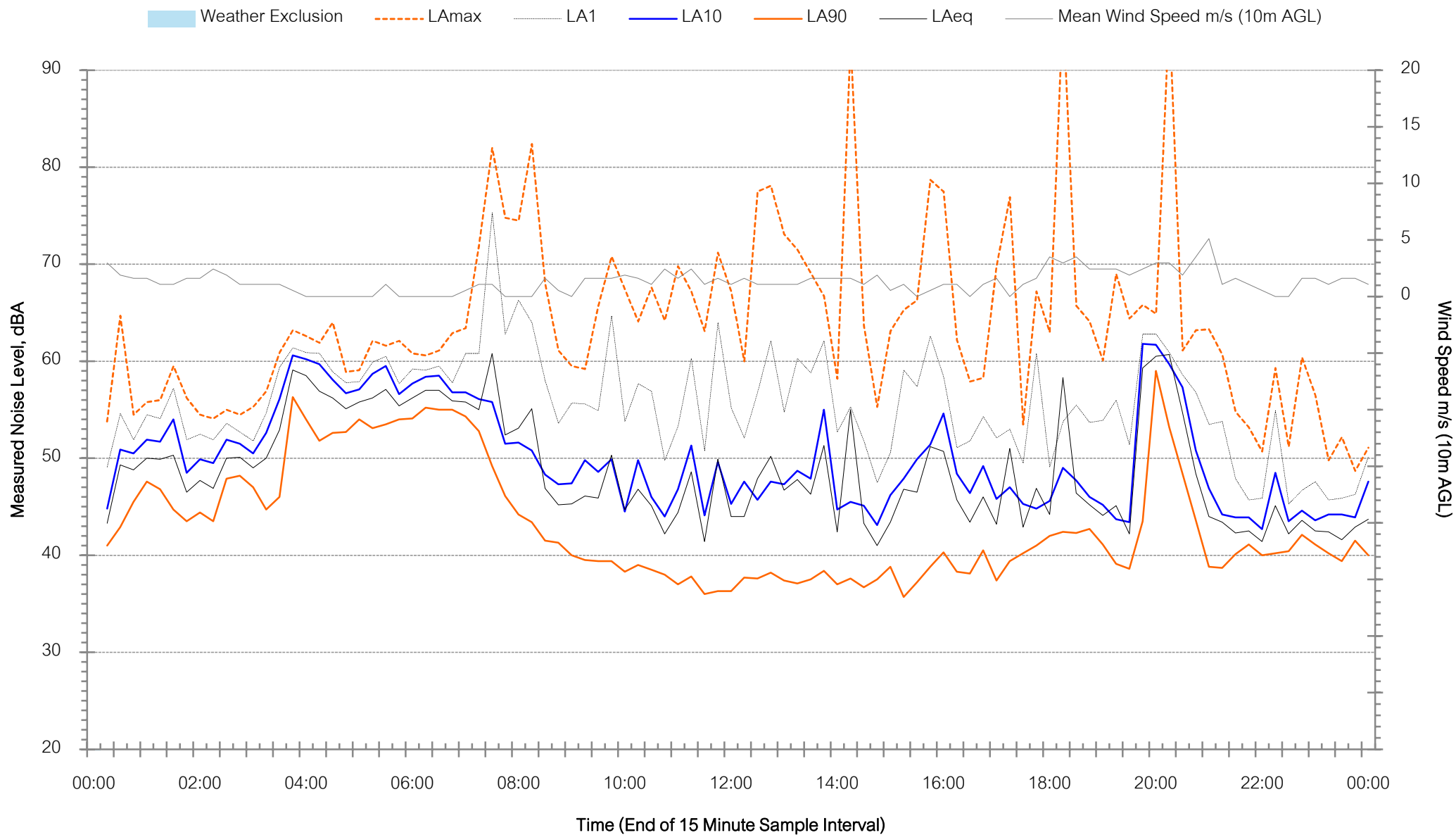
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Sunday 17 March 2024



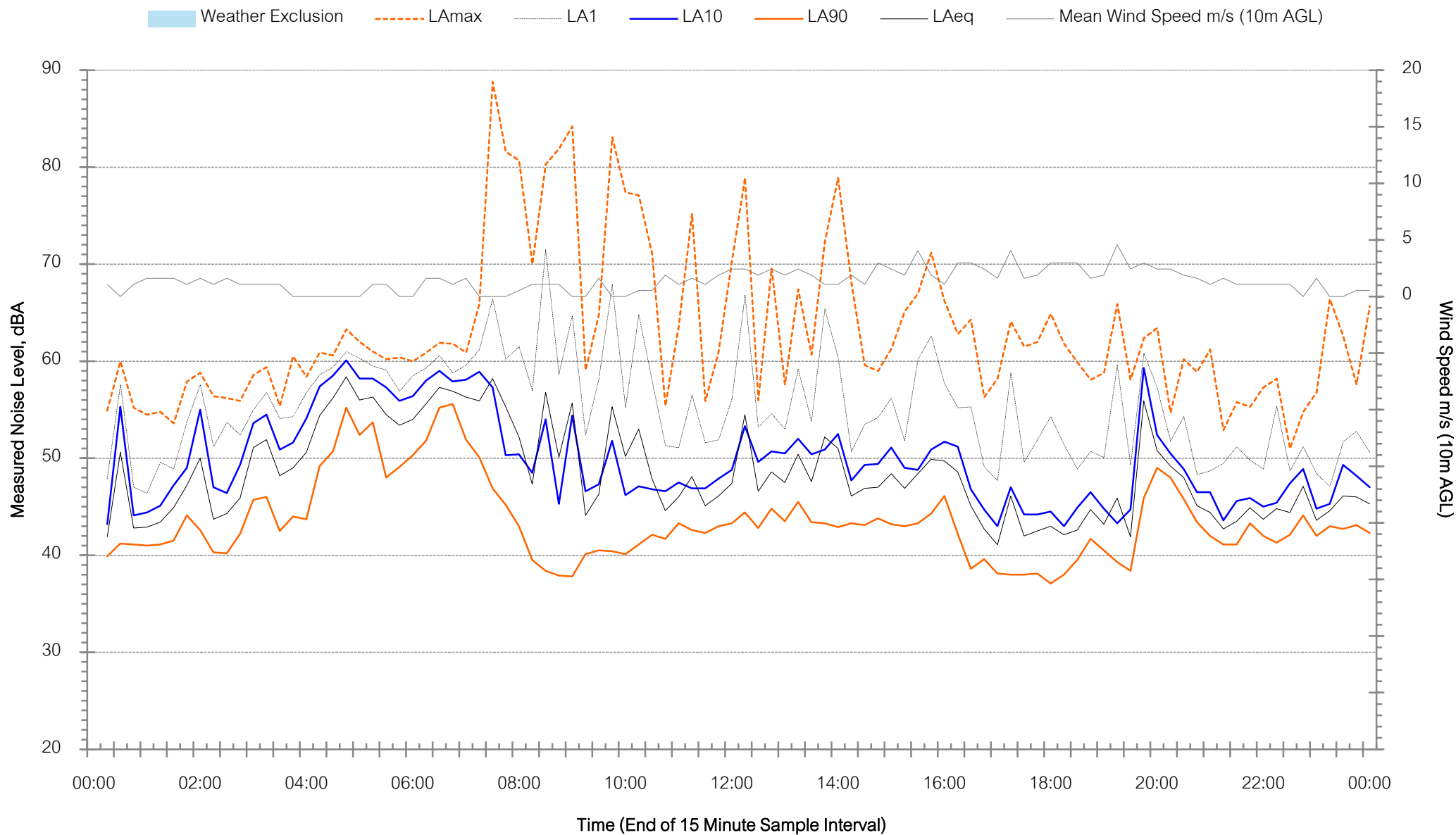
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Monday 18 March 2024



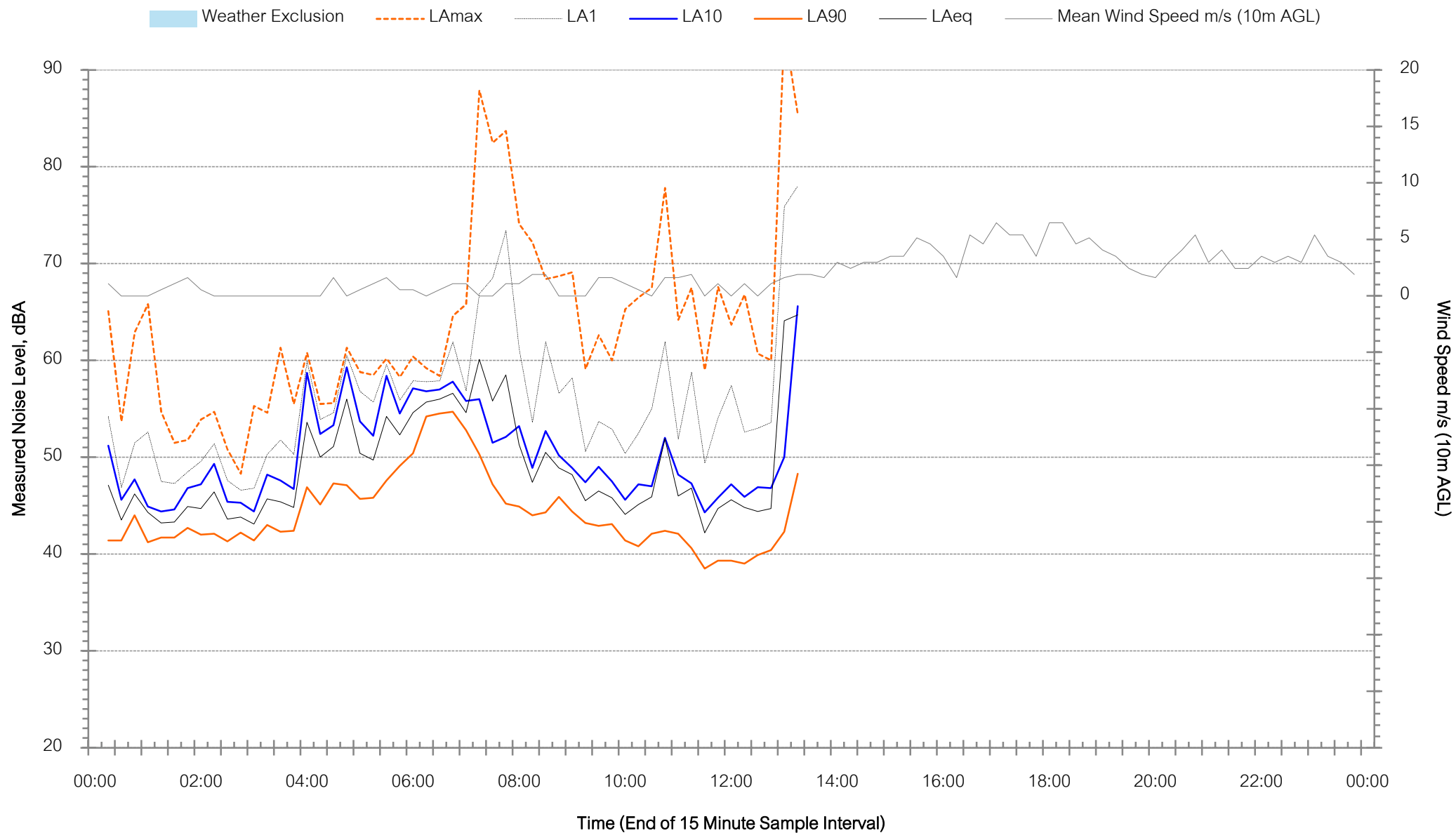
Background Noise Levels

217 Martin Road, Badgerys Creek (EPL 5) - Tuesday 19 March 2024



Background Noise Levels

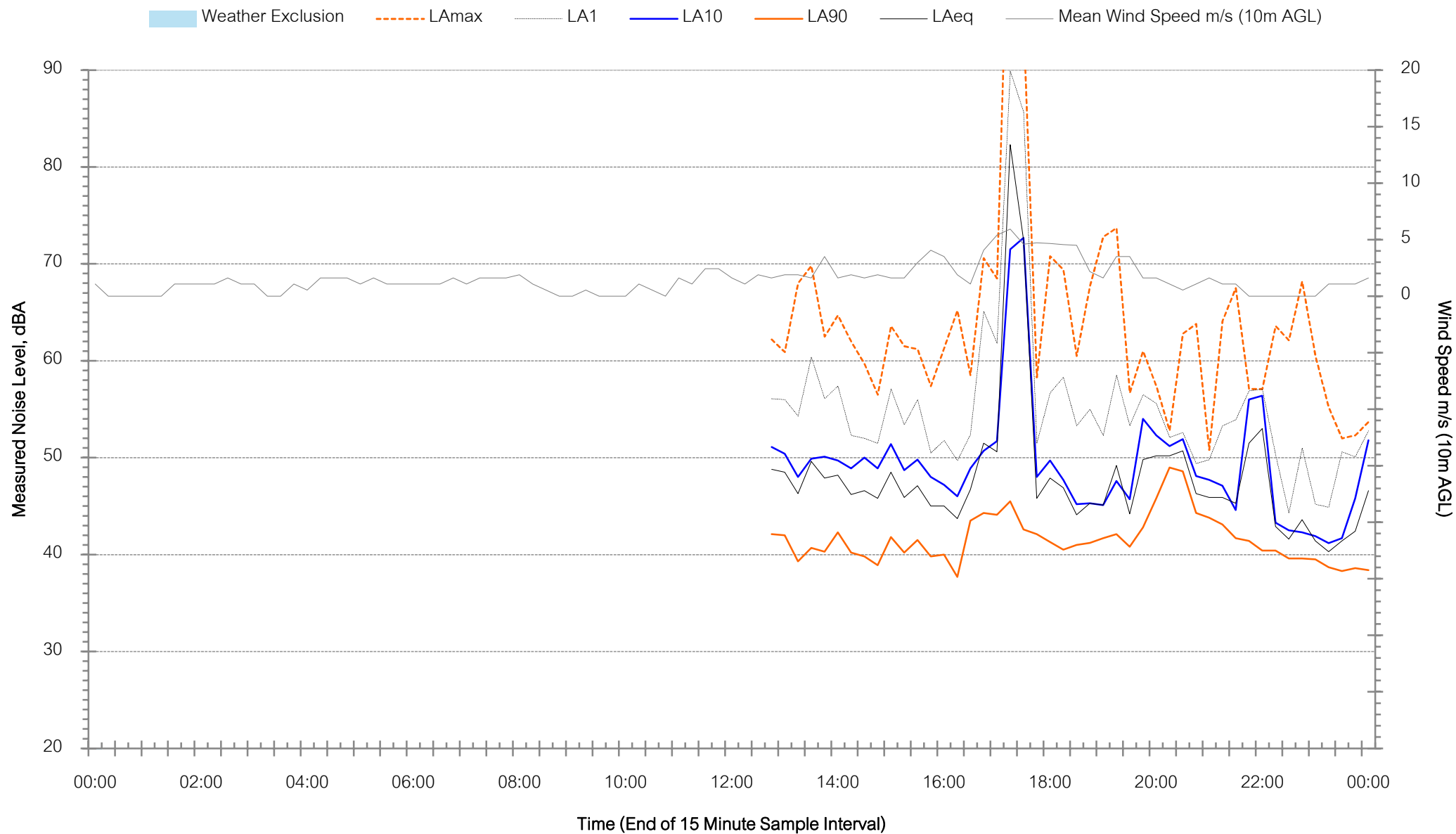
217 Martin Road, Badgerys Creek (EPL 5) - Wednesday 20 March 2024





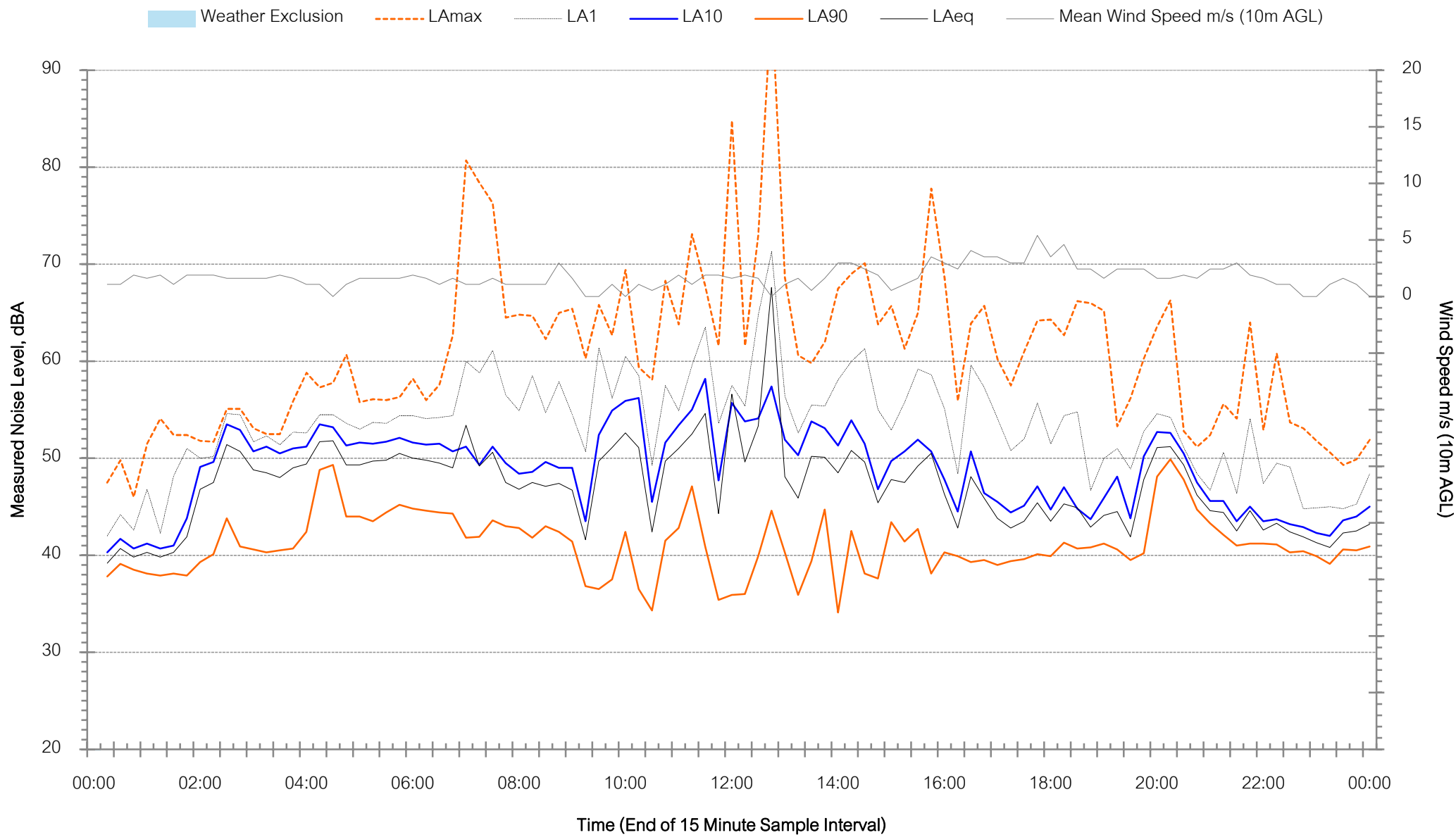
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Tuesday 12 March 2024



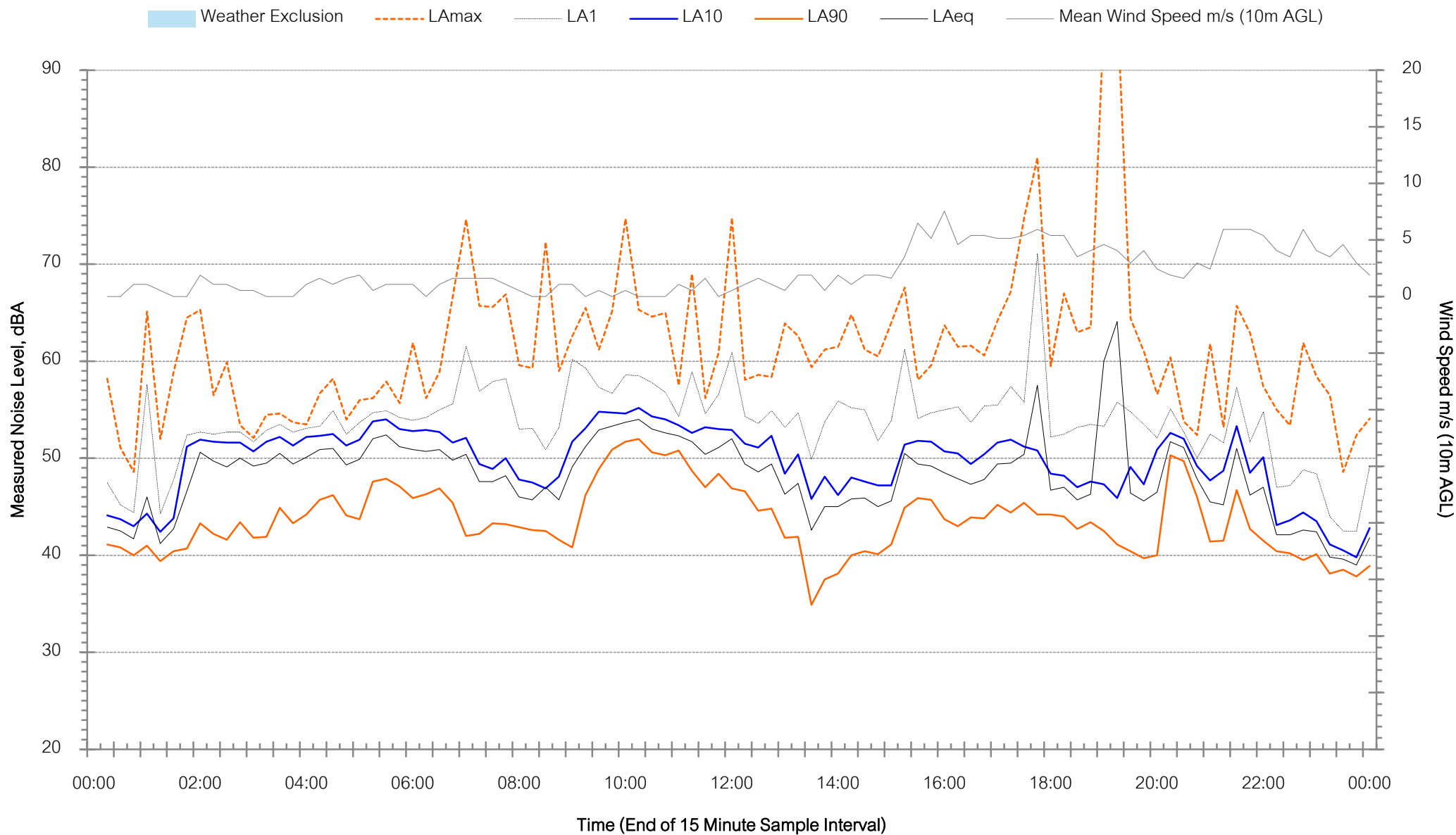
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Wednesday 13 March 2024



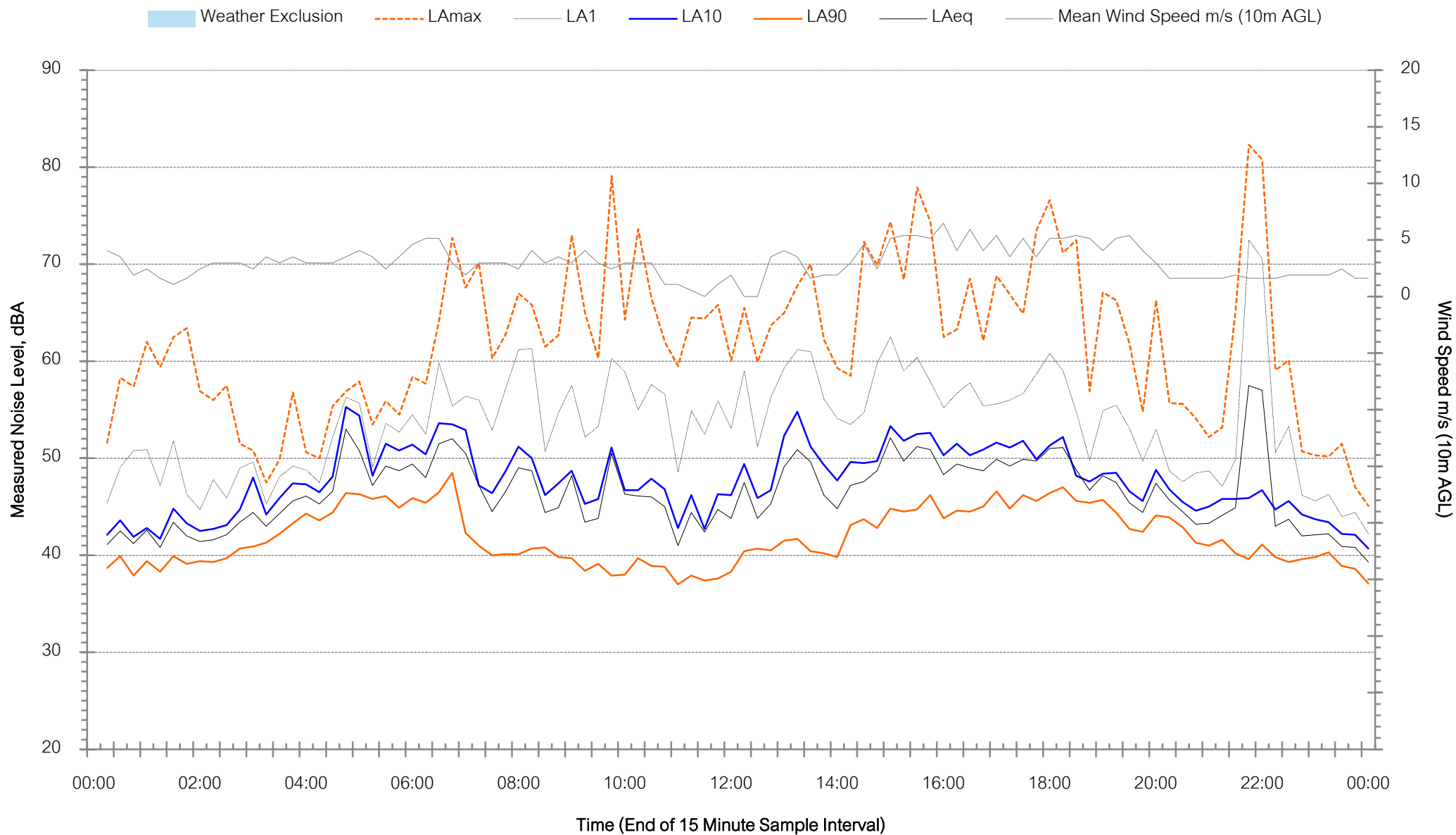
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Thursday 14 March 2024



Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Friday 15 March 2024



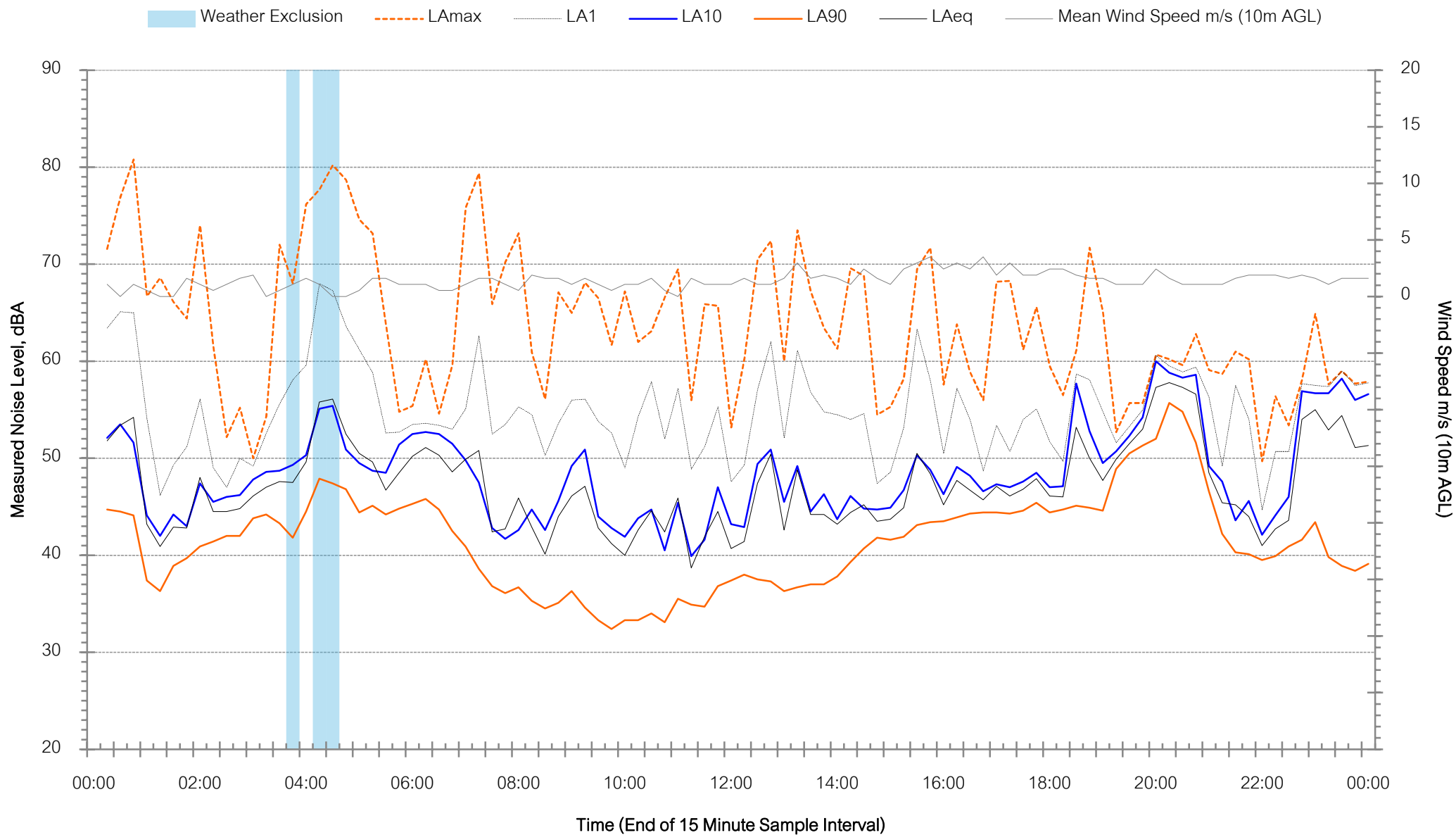
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Saturday 16 March 2024



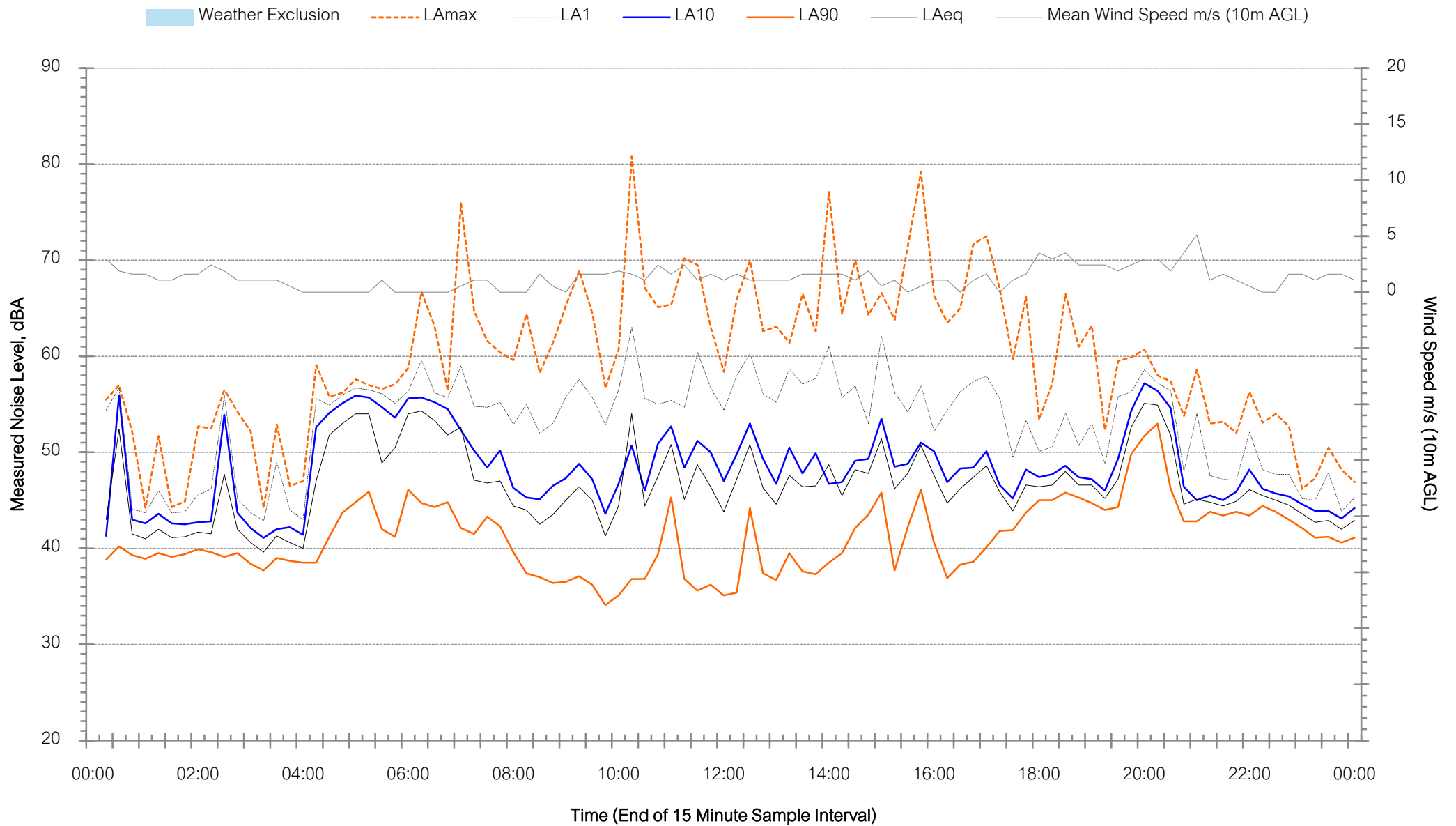
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Sunday 17 March 2024



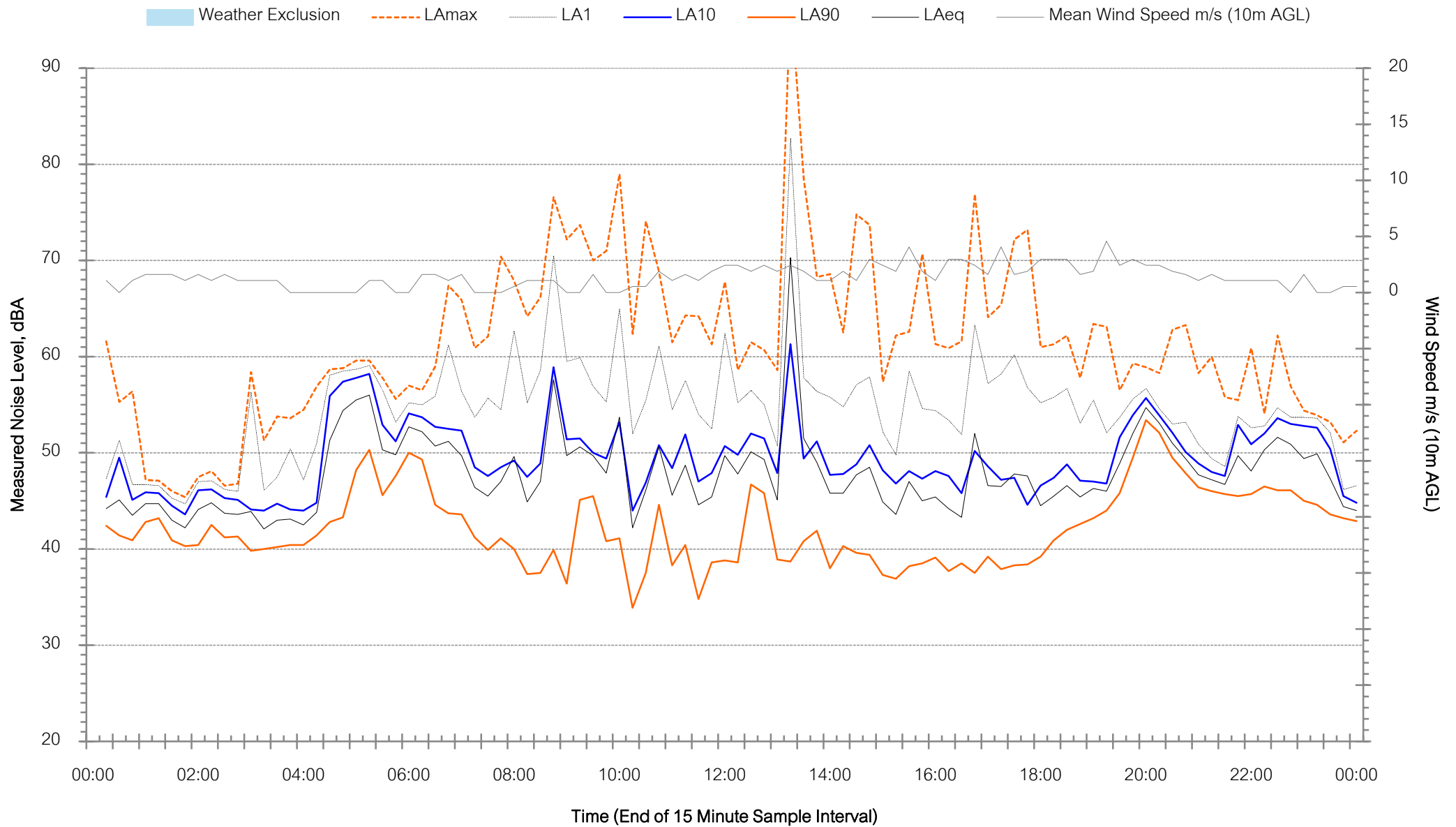
Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Monday 18 March 2024



Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Tuesday 19 March 2024



Background Noise Levels

330 Ramsay Road, Kemps Creek (EPA 6) - Wednesday 20 March 2024



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Noise Monitoring Assessment

CSR Advanced Manufacturing Hub
Badgerys Creek, NSW
Quarter Ending August 2024



Document Information

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending July 2024

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APPENDIX A – GLOSSARY OF TERMS		

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by PGH Bricks & Pavers Pty Limited (PGH) to complete a Noise Monitoring Assessment (NMA) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW.

This assessment has been undertaken for the quarterly period ending July 2024, and forms part of the annual noise monitoring program to address conditions outlined in the Consolidated Consent PA 10_0014 (the 'Consent') and Environmental Protection Licence #684 (EPL) noise limits.

The NMA has quantified potential operational noise emissions from the operation and has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL #684 (EPL), October 2023;
- Badgerys Creek Brick Quarry and Brick Making Project Noise Management Plan (BRK-BAD-Noise Management Version 7, 21/02/2023);
- NSW Government Department of Planning and Environment, Project Approval (PA) 10_0014, January 2022; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

CSR Advanced Manufacturing Hub is located at 235 Martin Road, Badgerys Creek, NSW. Receivers in the locality surrounding the site are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from the EPL (#684). The monitoring locations with respect to CSR are presented in the locality plan shown in **Figure 1**.

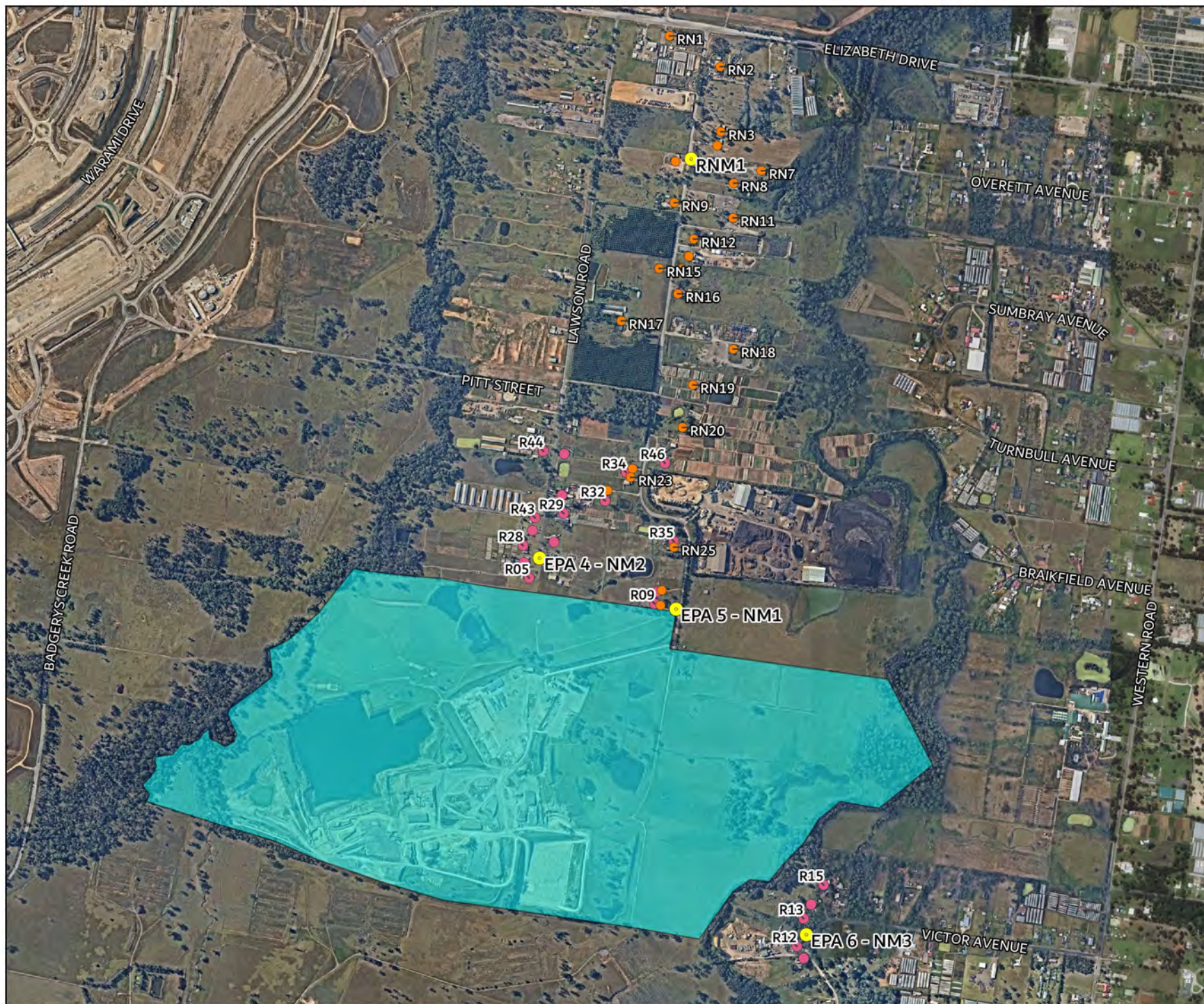
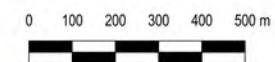


FIGURE 1
LOCALITY PLAN
MAC221719-01
CSR Advanced
Manufacturing Hub
Badgerys Creek, NSW

KEY

- Site Boundary
- Attended Monitoring Locations
- Consent Locations
- Traffic Locations



2 Noise Criteria

2.1 EPL Noise Limits

Section L4 of the project EPL (EPL #684) outlines the applicable operational noise criteria for all privately owned receivers surrounding the project. The criteria outlined in the EPL is reproduced below in **Table 1** along with relevant noise conditions:

L4.1 Noise from the premises (excluding mobile plant) must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.2 Noise from the operation of mobile plant must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 50 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 meters from the residence, at the most affected point within 30 meters of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

Table 1 EPL Noise Limits¹

Receiver	Location Description	Time Period	Noise Level Parameter	
			dB LAeq (15min)	dB LAF (max)
EPA Point 4	255 Lawson Road, Badgerys Creek, 2555	Morning Shoulder	42	N/A
		Day	42	N/A
		Evening	41	N/A
		Night	38	52
EPA Point 5	217 Martin Road, Badgerys Creek, 2555	Morning Shoulder	43	N/A
		Day	45	N/A
		Evening	40	N/A
		Night	38	52
EPA Point 6	50 Victor Avenue, Kemps Creek, 2178	Morning Shoulder	43	N/A
		Day	43	N/A
		Evening	43	N/A
		Night	38	52

Note 1: Noise criteria adopted from the EPL (EPL #684).

L4.5 For the purpose of the condition above:

- a) *Morning shoulder means the period from 5am and 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.*
- b) *Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.*
- c) *Evening means the period from 6pm to 10pm.*
- d) *Night means the period from 10pm to 5am Monday to Saturday and the period from 10pm to 5am Sunday and public holidays.*

2.2 Consent Noise Criteria

2.2.1 Operations

Schedule 3, Condition 5 of the consent outlines the applicable noise criteria for representative residential receivers surrounding the site and are presented in **Table 2**. The site includes the operation of a quarry and brickmaking plant, there are separate criteria relating to each period.

Table 2 Consent Noise Criteria ¹					
Receiver (EPA Reference)	Morning Shoulder	Day	Evening	Night ²	
	dB LAeq(15min)			dB LA1(max) ³	
R9, R25, R35 (EPA Point 5)	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46 (EPA Point 4)	42	42	41	38	52
R11, R12, R13, R14, R15 (EPA Point 6)	43	43	43	38	52
All other residences	N/A	40	35	35	52

Note 1: Noise criteria adopted from the Consent.

Note 2: Monitoring periods are defined in Section L4.5 of the EPL #684.

Note 3: Periods and parameters as expressed in the Consent.

2.2.2 Road Noise Criteria

Schedule 3, Condition 6 of the of the consent relating to road traffic noise are reproduced in **Table 3**.

Table 3 Road Traffic Noise Criteria dB(A)		
Road	Assessment Criteria (dBA)	
	Day and Evening	Night
	LAeq(1hour)	LAeq(1hour)
Prior to Martin Road and Elizabeth Road Intersection Upgrade		
Martin Road, Badgerys Creek, NSW	60	55
Following Martin Road and Elizabeth Road Intersection Upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residence on Martins Road	60	55

Note: The noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy.

Section 7.5.2 of the projects Noise Management Plan (NMP BRK-BAD-Noise Management Version 7, 21/02/2023) is reproduced below:

Road traffic noise monitoring will be conducted on a quarterly basis at one location for the first year of Phase 1 operations, or in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint.

Noise monitoring would ideally consist of attended monitoring over a one-hour period to accurately identify and quantify Project-related trucks against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport or where traffic flows are <10,000 vehicles per day a model that can accurately calculate low flow noise levels such as US Federal Highways Administration TNM (or equivalent)

Figure 1 presents the identified receiver locations and representative measurement locations.

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3 Methodology

3.1 Operator Attended Noise Monitoring

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022). Attended measurements were conducted using a Svantek Type 1, 971 noise analyser. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Attended noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at three (3) locations (EPA 4, EPA 5, EPA 6) on Monday 13 May 2024 during the day period to satisfy the requirements of the NMP and EPL. Attended measurements were not conducted during the evening and night periods due to the site not operating between the hours of 6pm and 7am.

Extraneous noise sources were excluded from the attended analysis to determine the $\text{LAeq}(15\text{min})$ site noise contribution for comparison against the relevant criteria. In the event of site attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the site is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

3.2 Attended Road Traffic Noise Monitoring

Attended road traffic monitoring was conducted on the boundary of 50 Martin Road, Badgerys Creek, NSW (RNM-1) using a Svantek Type 1, 971 noise analyser on Monday 13 May 2024. Noise levels obtained at the monitoring location are considered representative of 50 Martin Road, Badgerys Creek, NSW.

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4 Results

4.1 Traffic Monitoring Results

To assess road traffic noise levels associated with the site, a one (1) hour attended measurement was conducted on the boundary of 50 Martin Road, Badgerys Creek, NSW (RNM1), approximately 7m from the road centreline.

Traffic flows have been provided by CSR and included in the report to determine CSR traffic contribution along Martin Road during the measurement period. The results of the road traffic noise measurements on Monday 13 May 2024 are summarised in **Table 4** showing the overall ambient LAeq(1hour) noise level, the CSR contributed LAeq(1hour) noise level and the relevant noise limit.

Results of the road traffic noise measurements identify that traffic noise levels related to CSR at RNM1 are below the relevant criteria.

Table 4 Road Noise Survey Results – RNM1 (Daytime¹)

Date & Time	Measured dB LAeq(1hour)	CSR Contribution dB LAeq(1hour)	Compliance Limit dB LAeq(1hour)
13/05/2024 13:44	77 ²	59 ³	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Overall ambient level.

Note 3: CSR contributed road traffic noise level from (six (6) CSR truck passbys during the 1-hour period).

4.2 Road Traffic Compliance Assessment

Results of the road traffic noise measurements are calculated to all identified receivers showing the offset distance and the received level in **Table 5**. Results identify that traffic noise levels related to CSR at this location are below the consent criteria.

Table 5 Calculated Road Traffic Noise Levels (Daytime¹)

RTN ID	CSR Contribution dB LAeq(1hour) at RNM1	Offset from Road (m)	CSR Contribution dB LAeq(1hour) at Receiver	Compliance Limit dB LAeq(1hour)
RN1, RN19, RN24	59	120	46	60
RN2, RN12, RN13, RN26, RN27	59	60	49	60
RN3, RN4	59	90	48	60
RN5, RN6 RN15, RN25	59	45	51	60
RN7	59	250	43	60
RN8, RN11	59	160	45	60
RN9, RN14, RN16, RN21 RN22, RN23	59	30	52	60
RN10	59	75	48	60
RN17	59	140	46	60
RN18	59	240	43	60
RN20	59	105	47	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Prevailing Meteorological Conditions

Weather data for the noise assessment period was sourced from Badgerys Creek AWS Site 67108 as well as operator observations at each measurement location. The data was used to determine prevailing meteorological conditions at the time of the attended measurements. Meteorological data is presented in **Table 6**. Furthermore, wind speed at the microphone height satisfies requirements of Fact Sheet A of the NPI.

Table 6 Prevailing Meteorological Conditions

Date & Time	Badgerys Creek AWS Site 67108 (10m AGL)		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
13/05/2024 12:29	SW	7.6	S	2.8
13/05/2024 12:57	WSW	7.0	S	2.4
13/05/2024 13:23	SW	7.6	S	2.0

4.4 Assessment Results - Location EPA 4

The monitored noise level contributions and observed meteorological conditions at Location EPA 4 are presented in **Table 7**.

Table 7 Operator-Attended Noise Survey Results - Location EPA 4

Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
13/05/2024	12:29 (Day)	67	59	55	45	52	WD: S WS: 2.8m/s Rain: Nil	Aircraft 48-67
								Wind in vegetation 43-56
								Local residential noise 43-48
								Birds 46-54
								CSR inaudible
CSR Site L _A eq(15min) Contribution								<35
CSR Site L _A 10(15min) Contribution								<45

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5 Assessment Results - Location EPA 5

The monitored noise level contributions and observed meteorological conditions at Location EPA 5 are presented in **Table 8**.

Table 8 Operator-Attended Noise Survey Results - Location EPA 5

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _{Amax}	L _{A1}	L _{A10}	L _{A90}	L _{Aeq}		
13/05/2024	13:23 (Day)	85	76	57	43	61	WD: S WS: 2.0m/s Rain: Nil	Birds 42-54
								Insects <42
								Wind in vegetation 42-48
								Aircraft 42-85
								Traffic 42-81
								CSR haul trucks 44-48
								(5 seconds)
								CSR impacts 51-54
								(5 seconds)
								CSR Site L _{Aeq} (15min) Contribution
CSR Site L _{A10} (15min) Contribution							<40	

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.6 Assessment Results - Location EPA 6

The monitored noise level contributions and observed meteorological conditions at Location EPA 6 are presented in **Table 9**.

Table 9 Operator-Attended Noise Survey Results - Location EPA 6								
Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
13/05/2024	12:57 (Day)	81	70	56	46	58	WD: S WS: 2.4m/s Rain: Nil	Aircraft 45-62
								Birds 45-56
								Wind in vegetation 41-47
								Traffic 46-81
								Industrial noise 44-52
								CSR inaudible
CSR Site L _A eq(15min) Contribution								<36
CSR Site L _A 10(15min) Contribution								<40

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.7 Operational Compliance Assessment

The monitored noise level contributions are compared against the relevant criterion for the assessment are presented in **Table 10**.

Table 10 Operational Compliance Assessment							
Receiver Location	Time (hrs) ¹	CSR Site Contribution L _{A10} (15min)	EPL Limit L _{A10} (15min)	Compliant	CSR Site Contribution L _{Aeq} (15min)	Consent Criteria L _{Aeq} (15min)	Compliant
EPA 4	12:29	<45	50	✓	<35	42	✓
EPA 5	13:23	<40	50	✓	<30	45	✓
EPA 6	12:57	<40	50	✓	<36	43	✓

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

Noise measurements were not conducted during the evening or night periods at any location as CSR was not operational during these periods.

5.1 Assessment Results – Location RNM1

Offset calculations have been applied to assess attenuation of CSR traffic to residential receivers along Martin Road, Badgerys Creek. Monitoring on Monday 13 May 2024 identified that CSR traffic movements remain below relevant noise limits during the daytime measurement period at location RNM1.

Extraneous sources such as traffic, wind in vegetation, birds, insects, other industrial noise and aircraft were audible during the measurement period.

5.2 Assessment Results - Location EPA 4

Monitoring on Monday 13 May 2024 identified that CSR activities were inaudible during the measurement period at location EPA 4. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as aircraft, wind in vegetation, local residential noise and birds were audible during the measurement period.

5.3 Assessment Results - Location EPA 5

Monitoring on Monday 13 May 2024 identified that CSR activities were audible for approximately 10 seconds during the measurement period at location EPA 5. CSR activities were inclusive of truck movements entering, exiting site and site impacts from construction. The site contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as birds, insects, wind in vegetation, aircraft and traffic were audible during the measurement period.

5.4 Assessment Results - Location EPA 6

Monitoring on Monday 13 May 2024 identified that CSR activities were inaudible during the measurement period at location EPA 6. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as aircraft, birds, wind in vegetation, traffic and industrial noise were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) commissioned by PGH Bricks & Pavers Pty Limited (PGH) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW. The assessment was completed to assess the site's compliance with the EPL noise limits and consent noise criteria for the quarter ending July 2024.

Operator attended noise monitoring was undertaken on Monday 13 May 2024 at three (3) representative receiver locations. The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions.

Road traffic noise levels were influenced by extraneous noise sources such as insects, birds and local road traffic not associated with CSR. Notwithstanding, CSR road traffic noise levels comply with the relevant road noise criteria.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

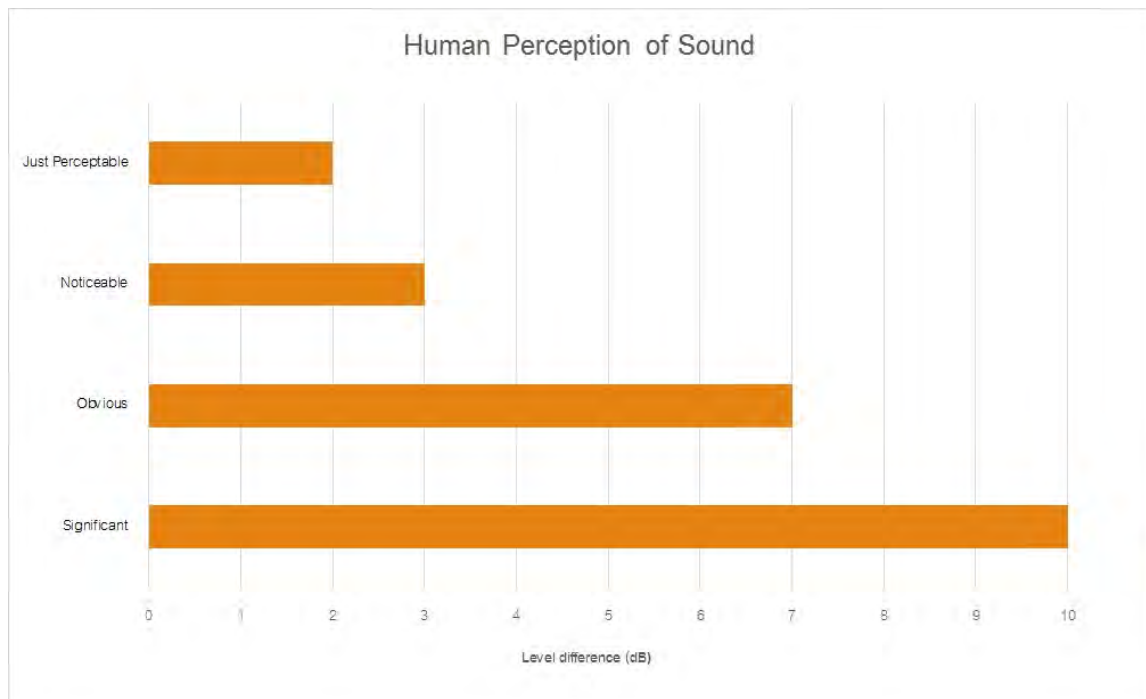
Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Noise Monitoring Assessment

CSR Advanced Manufacturing Hub
Badgerys Creek, NSW
Quarter Ending October 2024

Prepared for: PGH Bricks & Pavers Pty Limited
September 2024
MAC221719-01RP3



Document Information

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending October 2024

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APPENDIX A – GLOSSARY OF TERMS		

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by PGH Bricks & Pavers Pty Limited (PGH) to complete a Noise Monitoring Assessment (NMA) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW.

This assessment has been undertaken for the quarterly period ending October 2024, and forms part of the annual noise monitoring program to address conditions outlined in the Consolidated Consent PA 10_0014 (the 'Consent') and Environmental Protection Licence #684 (EPL) noise limits.

The NMA has quantified potential operational noise emissions from the operation and has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL #684 (EPL), October 2023;
- Badgerys Creek Brick Quarry and Brick Making Project Noise Management Plan (BRK-BAD-Noise Management Version 7, 21/02/2023;
- NSW Government Department of Planning and Environment, Project Approval (PA) 10_0014, January 2022; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

CSR Advanced Manufacturing Hub is located at 235 Martin Road, Badgerys Creek, NSW. Receivers in the locality surrounding the site are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from the EPL (#684). The monitoring locations with respect to CSR are presented in the locality plan shown in **Figure 1**.

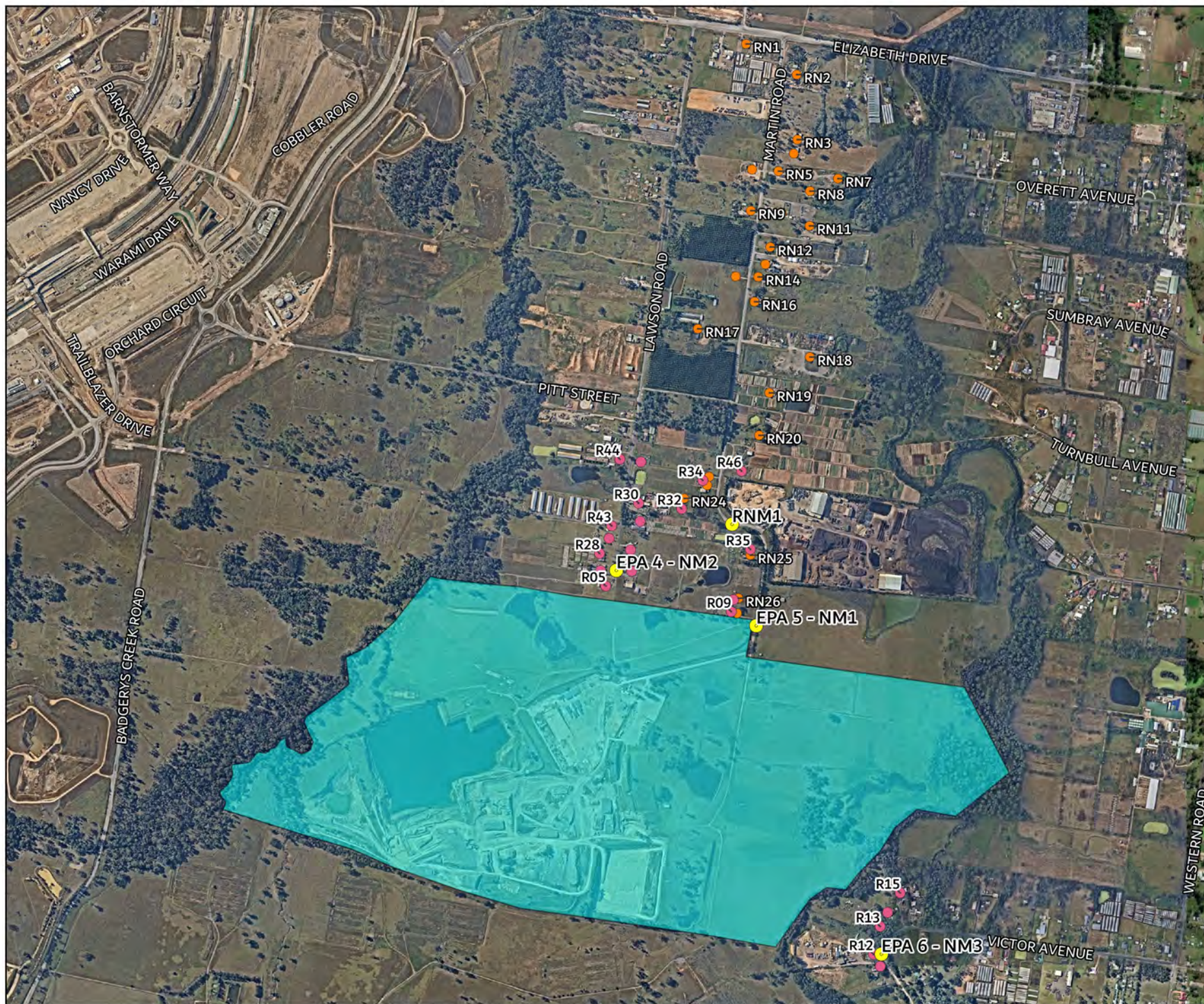
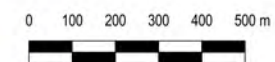


FIGURE 1
LOCALITY PLAN
MAC221719-01
CSR Advanced
Manufacturing Hub
Badgerys Creek, NSW

KEY

- Site Boundary
- Attended Monitoring Locations
- Consent Locations
- Traffic Locations



2 Noise Criteria

2.1 EPL Noise Limits

Section L4 of the project EPL (EPL #684) outlines the applicable operational noise criteria for all privately owned receivers surrounding the project. The criteria outlined in the EPL is reproduced below in **Table 1** along with relevant noise conditions:

L4.1 Noise from the premises (excluding mobile plant) must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.2 Noise from the operation of mobile plant must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 50 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 meters from the residence, at the most affected point within 30 meters of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

Table 1 EPL Noise Limits¹

Receiver	Location Description	Time Period	Noise Level Parameter	
			dB LAeq (15min)	dB LAF (max)
EPA Point 4	255 Lawson Road, Badgerys Creek, 2555	Morning Shoulder	42	N/A
		Day	42	N/A
		Evening	41	N/A
		Night	38	52
EPA Point 5	217 Martin Road, Badgerys Creek, 2555	Morning Shoulder	43	N/A
		Day	45	N/A
		Evening	40	N/A
		Night	38	52
EPA Point 6	50 Victor Avenue, Kemps Creek, 2178	Morning Shoulder	43	N/A
		Day	43	N/A
		Evening	43	N/A
		Night	38	52

Note 1: Noise criteria adopted from the EPL (EPL #684).

L4.5 For the purpose of the condition above:

- a) *Morning shoulder means the period from 5am and 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.*
- b) *Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.*
- c) *Evening means the period from 6pm to 10pm.*
- d) *Night means the period from 10pm to 5am Monday to Saturday and the period from 10pm to 5am Sunday and public holidays.*

2.2 Consent Noise Criteria

2.2.1 Operations

Schedule 3, Condition 5 of the consent outlines the applicable noise criteria for representative residential receivers surrounding the site and are presented in **Table 2**. The site includes the operation of a quarry and brickmaking plant, there are separate criteria relating to each period.

Table 2 Consent Noise Criteria¹					
Receiver (EPA Reference)	Morning Shoulder	Day	Evening	Night ²	
	dB LAeq(15min)			dB LA1(max) ³	
R9, R25, R35 (EPA Point 5)	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46 (EPA Point 4)	42	42	41	38	52
R11, R12, R13, R14, R15 (EPA Point 6)	43	43	43	38	52
All other residences	N/A	40	35	35	52

Note 1: Noise criteria adopted from the Consent.

Note 2: Monitoring periods are defined in Section L4.5 of the EPL #684.

Note 3: Periods and parameters as expressed in the Consent.

2.2.2 Road Noise Criteria

Schedule 3, Condition 6 of the of the consent relating to road traffic noise are reproduced in **Table 3**.

Table 3 Road Traffic Noise Criteria dB(A)		
Road	Assessment Criteria (dBA)	
	Day and Evening	Night
	LAeq(1hour)	LAeq(1hour)
Prior to Martin Road and Elizabeth Road Intersection Upgrade		
Martin Road, Badgerys Creek, NSW	60	55
Following Martin Road and Elizabeth Road Intersection Upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residence on Martins Road	60	55

Note: The noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy.

Section 7.5.2 of the projects Noise Management Plan (NMP BRK-BAD-Noise Management Version 7, 21/02/2023) is reproduced below:

Road traffic noise monitoring will be conducted on a quarterly basis at one location for the first year of Phase 1 operations, or in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint.

Noise monitoring would ideally consist of attended monitoring over a one-hour period to accurately identify and quantify Project-related trucks against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport or where traffic flows are <10,000 vehicles per day a model that can accurately calculate low flow noise levels such as US Federal Highways Administration TNM (or equivalent)

Figure 1 presents the identified receiver locations and representative measurement locations.

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3 Methodology

3.1 Operator Attended Noise Monitoring

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022). Attended measurements were conducted using a Svantek Type 1, 971 noise analyser. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Attended noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at three (3) locations (EPA 4, EPA 5, EPA 6) on Wednesday 11 September 2024 during the day period to satisfy the requirements of the NMP and EPL. Attended measurements were not conducted during the evening and night periods due to the site not operating between the hours of 6pm and 7am.

Extraneous noise sources were excluded from the attended analysis to determine the $\text{LA}_{\text{eq}}(15\text{min})$ site noise contribution for comparison against the relevant criteria. In the event of site attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the site is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

3.2 Attended Road Traffic Noise Monitoring

Attended road traffic monitoring was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM-1) using a Svantek Type 1, 971 noise analyser on Wednesday 11 September 2024. It is noted that the historic traffic monitoring location was not used due to roadworks along Martin Road.

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4 Results

4.1 Traffic Monitoring Results

To assess road traffic noise levels associated with the site, a one (1) hour attended measurement was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM1), approximately 7m from the road centreline.

Traffic flows have been provided by CSR and included in the report to determine CSR traffic contribution along Martin Road during the measurement period. The results of the road traffic noise measurements on Wednesday 11 September 2024 are summarised in **Table 4** showing the overall ambient LAeq(1hour) noise level, the CSR contributed LAeq(1hour) noise level and the relevant noise limit.

Results of the road traffic noise measurements identify that traffic noise levels related to CSR at RNM1 are below the relevant criteria.

Table 4 Road Noise Survey Results – RNM1 (Daytime¹)

Date & Time	Measured dB LAeq(1hour)	CSR Contribution dB LAeq(1hour)	Compliance Limit dB LAeq(1hour)
11/09/2024 09:25	63 ²	59 ³	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Overall ambient level.

Note 3: CSR contributed road traffic noise level from six (6) CSR truck passbys during the 1-hour period.

4.2 Road Traffic Compliance Assessment

Results of the road traffic noise measurements are calculated to all identified receivers showing the offset distance and the received level in **Table 5**. Results identify that traffic noise levels related to CSR at this location are below the consent criteria.

Table 5 Calculated Road Traffic Noise Levels (Daytime¹)

RTN ID	CSR Contribution dB LAeq(1hour) at RNM1	Offset from Road (m)	CSR Contribution dB LAeq(1hour) at Receiver	Compliance Limit dB LAeq(1hour)
RN1, RN19, RN24	59	120	46	60
RN2, RN12, RN13, RN26, RN27	59	60	49	60
RN3, RN4	59	90	48	60
RN5, RN6 RN15, RN25	59	45	51	60
RN7	59	250	43	60
RN8, RN11	59	160	45	60
RN9, RN14, RN16, RN21 RN22, RN23	59	30	52	60
RN10	59	75	48	60
RN17	59	140	46	60
RN18	59	240	43	60
RN20	59	105	47	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Prevailing Meteorological Conditions

Weather data for the noise assessment period was sourced from Badgerys Creek AWS Site 67108 as well as operator observations at each measurement location. The data was used to determine prevailing meteorological conditions at the time of the attended measurements. Meteorological data is presented in **Table 6**. Furthermore, wind speed at the microphone height satisfies requirements of Fact Sheet A of the NPI.

Table 6 Prevailing Meteorological Conditions

Date & Time	Badgerys Creek AWS Site 67108 (10m AGL)		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
11/09/2024 08:30	ESE	1.9	N	0.2
11/09/2024 09:04	E	1.6	N	0.2
11/09/2024 10:36	NE	1.9	N	0.4

4.4 Assessment Results - Location EPA 4

The monitored noise level contributions and observed meteorological conditions at Location EPA 4 are presented in **Table 7**.

Table 7 Operator-Attended Noise Survey Results - Location EPA 4								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology	Description and SPL, dBA
		LAmax	LA1	LA10	LA90	LAeq		
11/09/2024	10:36 (Day)	75	59	51	38	50	WD: N WS: 0.2m/s Rain: Nil	Traffic 37-75
								Birds 37-56
								Aircraft 40-58
								Local residential noise <37
								CSR inaudible
CSR Site LAeq(15min) Contribution								<28
CSR Site LA10(15min) Contribution								<41

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5 Assessment Results - Location EPA 5

The monitored noise level contributions and observed meteorological conditions at Location EPA 5 are presented in **Table 8**.

Table 8 Operator-Attended Noise Survey Results - Location EPA 5								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
11/09/2024	09:04 (Day)	81	74	59	45	61	WD: N WS: 0.4m/s Rain: Nil	Birds 43-58
								Other industrial noise 43-48
								Traffic 43-81
								Aircraft 46-69
								CSR inaudible
		CSR Site L _A eq(15min) Contribution					<45	
		CSR Site L _A 10(15min) Contribution					<49	

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.6 Assessment Results - Location EPA 6

The monitored noise level contributions and observed meteorological conditions at Location EPA 6 are presented in **Table 9**.

Table 9 Operator-Attended Noise Survey Results - Location EPA 6

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
11/09/2024	08:30 (Day)	80	70	56	42	57	WD: N	Traffic 40-80
							WS: 0.4m/s	Birds 40-68
							Rain: Nil	Other industrial noise <42
								CSR inaudible
		CSR Site L _A eq(15min) Contribution						<32
		CSR Site L _A 10(15min) Contribution						<46

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.7 Operational Compliance Assessment

The monitored noise level contributions are compared against the relevant criterion for the assessment are presented in **Table 10**.

Table 10 Operational Compliance Assessment

Receiver Location	Time (hrs) ¹	CSR Site Contribution	EPL Limit	Compliant	CSR Site Contribution	Consent Criteria	Compliant
		L _{A10} (15min)	L _{A10} (15min)		L _{Aeq} (15min)	L _{Aeq} (15min)	
EPA 4	10:36	<41	50	✓	<28	42	✓
EPA 5	09:04	<49	50	✓	<45	45	✓
EPA 6	08:30	<46	50	✓	<32	43	✓

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

Noise measurements were not conducted during the evening or night periods at any location as CSR was not operational during these periods.

5.1 Assessment Results – Location RNM1

Offset calculations have been applied to assess attenuation of CSR traffic to residential receivers along Martin Road, Badgerys Creek. Monitoring on Wednesday 11 September 2024 identified that CSR traffic movements remain below relevant noise limits during the daytime measurement period at location RNM1.

Extraneous sources such as traffic, wind in vegetation, birds, insects, other industrial noise and aircraft were audible during the measurement period.

5.2 Assessment Results - Location EPA 4

Monitoring on Wednesday 11 September 2024 identified that CSR activities were inaudible during the measurement period at location EPA 4. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as traffic, birds, aircraft and local residential noise were audible during the measurement period.

5.3 Assessment Results - Location EPA 5

Monitoring on Wednesday 11 September 2024 identified that CSR activities were inaudible during the measurement period at location EPA 5. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as birds, aircraft, other industrial noise and traffic were audible during the measurement period.

5.4 Assessment Results - Location EPA 6

Monitoring on Wednesday 11 September 2024 identified that CSR activities were inaudible during the measurement period at location EPA 6. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as traffic, birds and other industrial noise were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) commissioned by PGH Bricks & Pavers Pty Limited (PGH) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW. The assessment was completed to assess the site's compliance with the EPL noise limits and consent noise criteria for the quarter ending October 2024.

Operator attended noise monitoring was undertaken on Wednesday 11 September 2024 at three (3) representative receiver locations. The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions.

Road traffic noise levels were influenced by extraneous noise sources such as insects, birds and local road traffic not associated with CSR. Notwithstanding, CSR road traffic noise levels comply with the relevant road noise criteria.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

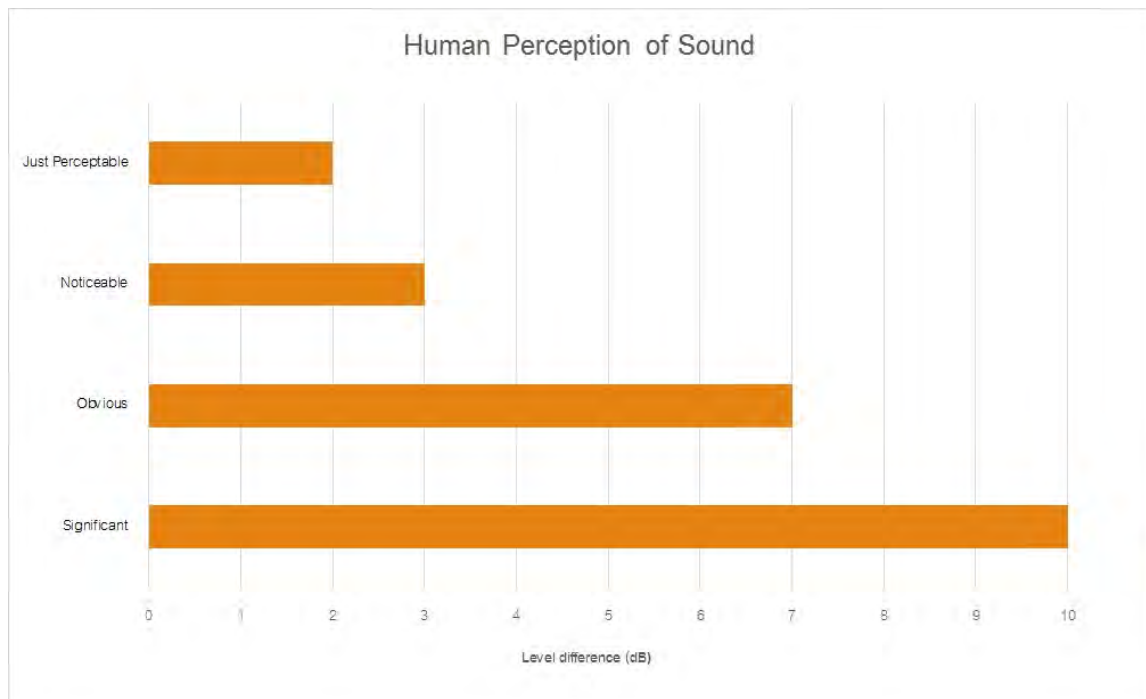
Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending January 2025



Document Information

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending January 2025

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by PGH Bricks & Pavers Pty Limited (PGH) to complete a Noise Monitoring Assessment (NMA) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW.

This assessment has been undertaken for the quarterly period ending January 2025, and forms part of the annual noise monitoring program to address conditions outlined in the Consolidated Consent PA 10_0014 (the 'Consent') and Environmental Protection Licence #684 (EPL) noise limits.

The NMA has quantified potential operational noise emissions from the operation and has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL #684 (EPL), October 2023;
- Badgerys Creek Brick Quarry and Brick Making Project Noise Management Plan (BRK-BAD-Noise Management Version 7, 21/02/2023;
- NSW Government Department of Planning and Environment, Project Approval (PA) 10_0014, January 2022; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

CSR Advanced Manufacturing Hub is located at 235 Martin Road, Badgerys Creek, NSW. Receivers in the locality surrounding the site are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from the EPL (#684). The monitoring locations with respect to CSR are presented in the locality plan shown in **Figure 1**.

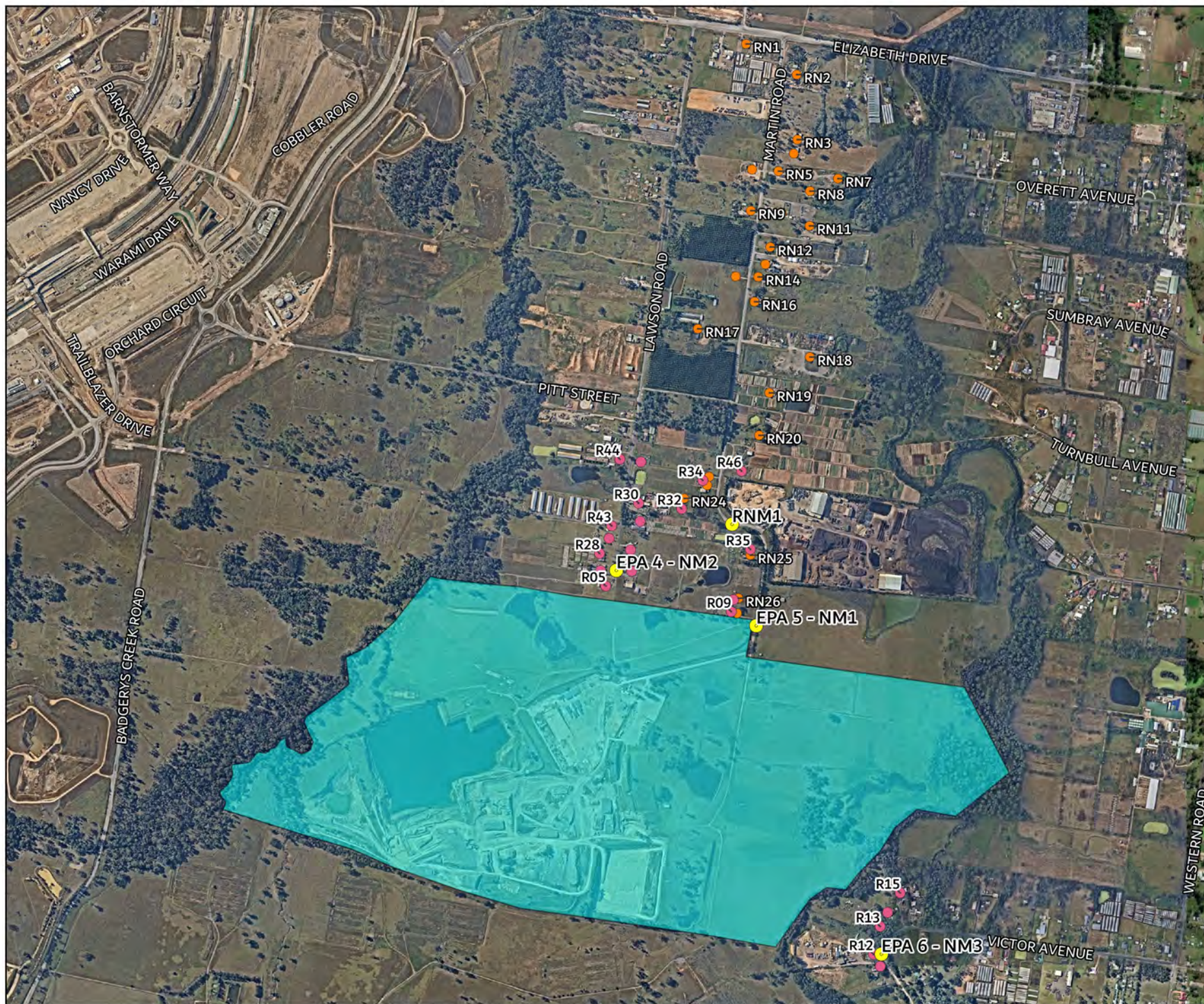
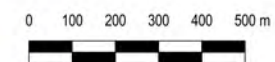


FIGURE 1
LOCALITY PLAN
MAC221719-01
CSR Advanced
Manufacturing Hub
Badgerys Creek, NSW

KEY

- Site Boundary
- Attended Monitoring Locations
- Consent Locations
- Traffic Locations



2 Noise Criteria

2.1 EPL Noise Limits

Section L4 of the project EPL (EPL #684) outlines the applicable operational noise criteria for all privately owned receivers surrounding the project. The criteria outlined in the EPL is reproduced below in **Table 1** along with relevant noise conditions:

L4.1 Noise from the premises (excluding mobile plant) must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.2 Noise from the operation of mobile plant must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 50 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 meters from the residence, at the most affected point within 30 meters of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

Table 1 EPL Noise Limits¹

Receiver	Location Description	Time Period	Noise Level Parameter	
			dB LAeq (15min)	dB LAF (max)
EPA Point 4	255 Lawson Road, Badgerys Creek, 2555	Morning Shoulder	42	N/A
		Day	42	N/A
		Evening	41	N/A
		Night	38	52
EPA Point 5	217 Martin Road, Badgerys Creek, 2555	Morning Shoulder	43	N/A
		Day	45	N/A
		Evening	40	N/A
		Night	38	52
EPA Point 6	50 Victor Avenue, Kemps Creek, 2178	Morning Shoulder	43	N/A
		Day	43	N/A
		Evening	43	N/A
		Night	38	52

Note 1: Noise criteria adopted from the EPL (EPL #684).

L4.5 For the purpose of the condition above:

- a) *Morning shoulder means the period from 5am and 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.*
- b) *Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.*
- c) *Evening means the period from 6pm to 10pm.*
- d) *Night means the period from 10pm to 5am Monday to Saturday and the period from 10pm to 5am Sunday and public holidays.*

2.2 Consent Noise Criteria

2.2.1 Operations

Schedule 3, Condition 5 of the consent outlines the applicable noise criteria for representative residential receivers surrounding the site and are presented in **Table 2**. The site includes the operation of a quarry and brickmaking plant, there are separate criteria relating to each period.

Table 2 Consent Noise Criteria¹					
Receiver (EPA Reference)	Morning Shoulder	Day	Evening	Night ²	
	dB LAeq(15min)			dB LA1(max) ³	
R9, R25, R35 (EPA Point 5)	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46 (EPA Point 4)	42	42	41	38	52
R11, R12, R13, R14, R15 (EPA Point 6)	43	43	43	38	52
All other residences	N/A	40	35	35	52

Note 1: Noise criteria adopted from the Consent.

Note 2: Monitoring periods are defined in Section L4.5 of the EPL #684.

Note 3: Periods and parameters as expressed in the Consent.

2.2.2 Road Noise Criteria

Schedule 3, Condition 6 of the of the consent relating to road traffic noise are reproduced in **Table 3**.

Table 3 Road Traffic Noise Criteria dB(A)		
Road	Assessment Criteria (dBA)	
	Day and Evening	Night
	LAeq(1hour)	LAeq(1hour)
Prior to Martin Road and Elizabeth Road Intersection Upgrade		
Martin Road, Badgerys Creek, NSW	60	55
Following Martin Road and Elizabeth Road Intersection Upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residence on Martins Road	60	55

Note: The noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy.

Section 7.5.2 of the projects Noise Management Plan (NMP BRK-BAD-Noise Management Version 7, 21/02/2023) is reproduced below:

Road traffic noise monitoring will be conducted on a quarterly basis at one location for the first year of Phase 1 operations, or in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint.

Noise monitoring would ideally consist of attended monitoring over a one-hour period to accurately identify and quantify Project-related trucks against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport or where traffic flows are <10,000 vehicles per day a model that can accurately calculate low flow noise levels such as US Federal Highways Administration TNM (or equivalent)

Figure 1 presents the identified receiver locations and representative measurement locations.

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3 Methodology

3.1 Operator Attended Noise Monitoring

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022). Attended measurements were conducted using a Svantek Type 1, 971 noise analyser. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Attended noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at three (3) locations (EPA 4, EPA 5, EPA 6) on Thursday 5 December 2024 during the day period to satisfy the requirements of the NMP and EPL. Attended measurements were not conducted during the evening and night periods due to the site not operating between the hours of 6pm and 7am.

Extraneous noise sources were excluded from the attended analysis to determine the $\text{LA}_{\text{eq}}(15\text{min})$ site noise contribution for comparison against the relevant criteria. In the event of site attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the site is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

3.2 Attended Road Traffic Noise Monitoring

Attended road traffic monitoring was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM-1) using a Svantek Type 1, 971 noise analyser on Thursday 5 December 2024. It is noted that the historic traffic monitoring location was not used due to roadworks along Martin Road.

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4 Results

4.1 Traffic Monitoring Results

To assess road traffic noise levels associated with the site, a one (1) hour attended measurement was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM1), approximately 7m from the road centreline.

Traffic flows have been provided by CSR and included in the report to determine CSR traffic contribution along Martin Road during the measurement period. The results of the road traffic noise measurements on Thursday 5 December 2024 are summarised in **Table 4** showing the overall ambient LAeq(1hour) noise level, the CSR contributed LAeq(1hour) noise level and the relevant noise limit.

Results of the road traffic noise measurements identify that traffic noise levels related to CSR at RNM1 are below the relevant criteria.

Table 4 Road Noise Survey Results – RNM1 (Daytime¹)

Date & Time	Measured dB LAeq(1hour)	CSR Contribution dB LAeq(1hour)	Compliance Limit dB LAeq(1hour)
05/12/2024 12:25	67 ²	55 ³	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Overall ambient level.

Note 3: CSR contributed road traffic noise level from five (5) CSR truck passbys during the 1-hour period.

4.2 Road Traffic Compliance Assessment

Results of the road traffic noise measurements are calculated to all identified receivers showing the offset distance and the received level in **Table 5**. Results identify that traffic noise levels related to CSR at this location are below the consent criteria.

Table 5 Calculated Road Traffic Noise Levels (Daytime¹)

RTN ID	CSR Contribution dB LAeq(1hour) at RNM1	Offset from Road (m)	CSR Contribution dB LAeq(1hour) at Receiver	Compliance Limit dB LAeq(1hour)
RN1, RN19, RN24	55	120	39	60
RN2, RN12, RN13, RN26, RN27	55	60	42	60
RN3, RN4	55	90	40	60
RN5, RN6 RN15, RN25	55	45	43	60
RN7	55	250	35	60
RN8, RN11	55	160	37	60
RN9, RN14, RN16, RN21 RN22, RN23	55	30	45	60
RN10	55	75	41	60
RN17	55	140	38	60
RN18	55	240	36	60
RN20	55	105	39	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Prevailing Meteorological Conditions

Weather data for the noise assessment period was sourced from Badgerys Creek AWS Site 67108 as well as operator observations at each measurement location. The data was used to determine prevailing meteorological conditions at the time of the attended measurements. Meteorological data is presented in **Table 6**. Furthermore, wind speed at the microphone height satisfies requirements of Fact Sheet A of the NPI.

Table 6 Prevailing Meteorological Conditions

Date & Time	Badgerys Creek AWS Site 67108 (10m AGL)		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
05/12/2024 11:48	NNE	2.4	W	1.2
05/12/2024 12:08	NNE	2.4	W	1.2
05/12/2024 13:38	NNE	2.9	W	0.8

4.4 Assessment Results - Location EPA 4

The monitored noise level contributions and observed meteorological conditions at Location EPA 4 are presented in **Table 7**.

Table 7 Operator-Attended Noise Survey Results - Location EPA 4															
Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA							
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq									
05/12/2024	12:08 (Day)	78	73	64	62	64	WD: W WS: 1.2m/s Rain: Nil	Truck idle 59-64							
								Insects <59							
								Birds <59							
								Other industry <59							
								Traffic 60-78							
								CSR inaudible							
								CSR Site L _A eq(15min) Contribution							<42
								CSR Site L _A 10(15min) Contribution							<50
Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.															

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5 Assessment Results - Location EPA 5

The monitored noise level contributions and observed meteorological conditions at Location EPA 5 are presented in **Table 8**.

Table 8 Operator-Attended Noise Survey Results - Location EPA 5								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
05/12/2024	11:48 (Day)	61	56	50	43	47	WD: W WS: 1.2m/s Rain: Nil	Traffic 41-56
								Birds 41-61
								Residential noise 44-54
								Other industry 41-43
								Aircraft <44
								Wind in vegetation <41
								CSR inaudible
								CSR Site L _A eq(15min) Contribution
CSR Site L _A 10(15min) Contribution								

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.6 Assessment Results - Location EPA 6

The monitored noise level contributions and observed meteorological conditions at Location EPA 6 are presented in **Table 9**.

Table 9 Operator-Attended Noise Survey Results - Location EPA 6

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA	
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq			
05/12/2024	13:38 (Day)	82	62	54	45	53	WD: W WS: 0.8m/s Rain: Nil	Insects 43-46	
								Birds 44-54	
								Other industry <43	
								Traffic 43-82	
								Aircraft 43-47	
								Local residential noise 48-54	
								CSR inaudible	
								CSR Site L _A eq(15min) Contribution	<35
								CSR Site L _A 10(15min) Contribution	<44

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.7 Operational Compliance Assessment

The monitored noise level contributions are compared against the relevant criterion for the assessment are presented in **Table 10**.

Table 10 Operational Compliance Assessment

Receiver Location	Time (hrs) ¹	CSR Site Contribution	EPL Limit	Compliant	CSR Site Contribution	Consent Criteria	Compliant
		L _A 10(15min)	L _A 10(15min)		L _A eq(15min)	L _A eq(15min)	
EPA 4	12:08	<50	50	✓	<42	42	✓
EPA 5	11:48	<40	50	✓	<33	45	✓
EPA 6	13:38	<44	50	✓	<35	43	✓

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

Noise measurements were not conducted during the evening or night periods at any location as CSR was not operational during these periods.

5.1 Assessment Results – Location RNM1

Offset calculations have been applied to assess attenuation of CSR traffic to residential receivers along Martin Road, Badgerys Creek. Monitoring on Thursday 5 December 2024 identified that CSR traffic movements remain below relevant noise limits during the daytime measurement period at location RNM1.

Extraneous sources such as other industry, insects, birds, traffic and aircraft were audible during the measurement period.

5.2 Assessment Results - Location EPA 4

Monitoring on Thursday 5 December 2024 identified that CSR activities were inaudible during the measurement period at location EPA 4. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as traffic, insects, birds and other industry were audible during the measurement period.

5.3 Assessment Results - Location EPA 5

Monitoring on Thursday 5 December 2024 identified that CSR activities were inaudible during the measurement period at location EPA 5. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as traffic, birds, local residential noise, other industry, aircraft and wind in vegetation were audible during the measurement period.

5.4 Assessment Results - Location EPA 6

Monitoring on Thursday 5 December 2024 identified that CSR activities were inaudible during the measurement period at location EPA 6. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as insects, birds, other industry, traffic, aircraft and local residential noise were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) commissioned by PGH Bricks & Pavers Pty Limited (PGH) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW. The assessment was completed to assess the site's compliance with the EPL noise limits and consent noise criteria for the quarter ending January 2025.

Operator attended noise monitoring was undertaken on Thursday 5 December 2024 at three (3) representative receiver locations. The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions.

Road traffic noise levels were influenced by extraneous noise sources such as insects, birds and local road traffic not associated with CSR. Notwithstanding, CSR road traffic noise levels comply with the relevant road noise criteria.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

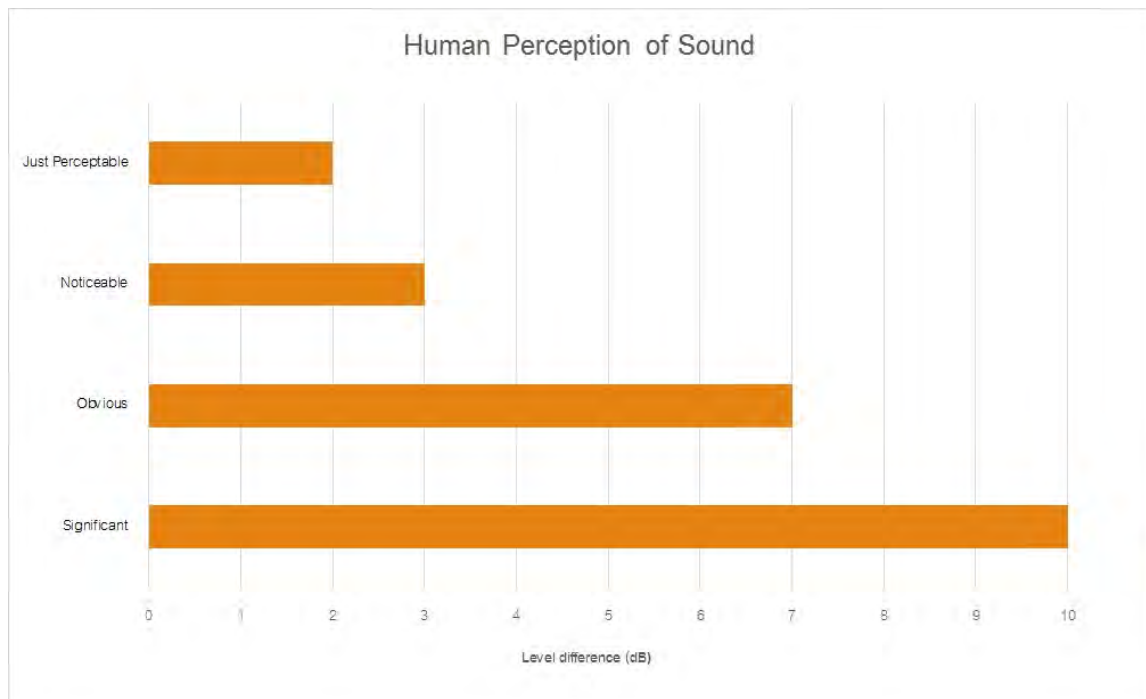
Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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Noise Monitoring Assessment

CSR Advanced Manufacturing Hub
Badgerys Creek, NSW
Quarter Ending April 2025



Document Information

Noise Monitoring Assessment

CSR Advanced Manufacturing Hub

Badgerys Creek, NSW

Quarter Ending April 2025

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APPENDIX A – GLOSSARY OF TERMS		

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1 Introduction

Muller Acoustic Consulting Pty Ltd (MAC) has been commissioned by PGH Bricks & Pavers Pty Limited (PGH) to complete a Noise Monitoring Assessment (NMA) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW.

This assessment has been undertaken for the quarterly period ending April 2025, and forms part of the annual noise monitoring program to address conditions outlined in the Consolidated Consent PA 10_0014 (the 'Consent') and Environmental Protection Licence #684 (EPL) noise limits.

The NMA has quantified potential operational noise emissions from the operation and has been conducted in accordance with the following documents:

- NSW Environment Protection Authority (EPA), Noise Policy for Industry (NPI), 2017;
- NSW Environment Protection Authority (EPA's), Approved Methods for the measurement and analysis of environmental noise in NSW, 2022;
- Environment Protection Licence EPL #684 (EPL), October 2023;
- Badgerys Creek Brick Quarry and Brick Making Project Noise Management Plan (BRK-BAD-Noise Management Version 7, 21/02/2023;
- NSW Government Department of Planning and Environment, Project Approval (PA) 10_0014, January 2022; and
- Standards Australia AS 1055:2018 - Acoustics - Description and measurement of environmental noise.

A glossary of terms, definitions and abbreviations used in this report is provided in **Appendix A**.

1.1 Locality

CSR Advanced Manufacturing Hub is located at 235 Martin Road, Badgerys Creek, NSW. Receivers in the locality surrounding the site are primarily rural/residential and for consistency the naming conventions for each receiver have been retained from the EPL (#684). The monitoring locations with respect to CSR are presented in the locality plan shown in **Figure 1**.

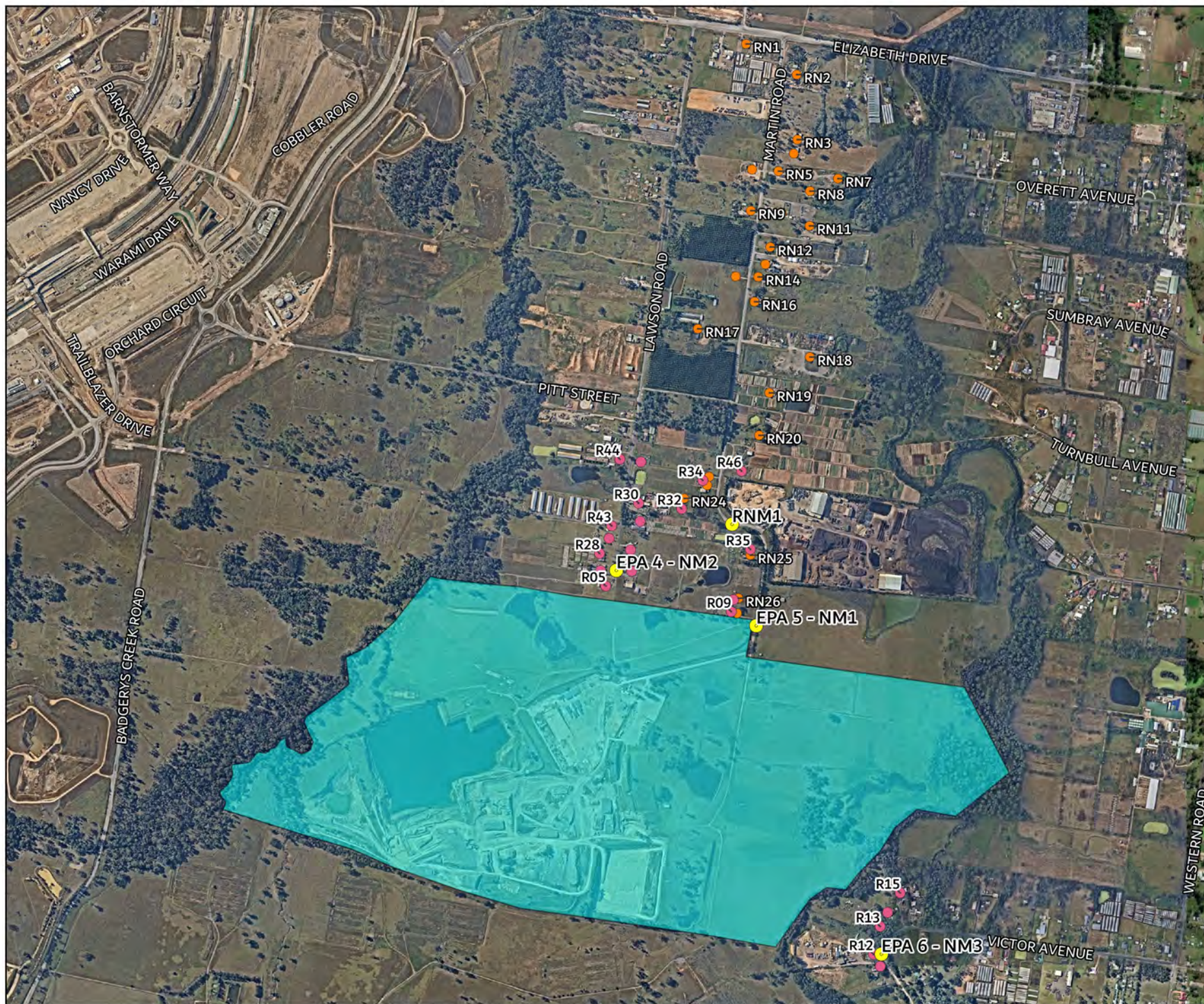
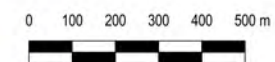


FIGURE 1
LOCALITY PLAN
MAC221719-01
CSR Advanced
Manufacturing Hub
Badgerys Creek, NSW

KEY

- Site Boundary
- Attended Monitoring Locations
- Consent Locations
- Traffic Locations



2 Noise Criteria

2.1 EPL Noise Limits

Section L4 of the project EPL (EPL #684) outlines the applicable operational noise criteria for all privately owned receivers surrounding the project. The criteria outlined in the EPL is reproduced below in **Table 1** along with relevant noise conditions:

L4.1 Noise from the premises (excluding mobile plant) must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 55 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.2 Noise from the operation of mobile plant must not exceed:

- a) An LA10 (15 minute) noise emission criterion of 50 dB(A) (0700 to 2200) Monday to Saturday and (0800 to 2200) Sunday and Public Holidays; and*
- b) An LA10 (15 minute) noise emission criterion of 40 dB(A) at all other times, except as expressly provided by this licence.*

L4.3 Noise from the premises is to be measured or computed at the most affected point on or within the residential property boundary or, if that is more than 30 meters from the residence, at the most affected point within 30 meters of the residence to determine compliance with condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L4.4 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

Table 1 EPL Noise Limits¹

Receiver	Location Description	Time Period	Noise Level Parameter	
			dB LAeq (15min)	dB LAF (max)
EPA Point 4	255 Lawson Road, Badgerys Creek, 2555	Morning Shoulder	42	N/A
		Day	42	N/A
		Evening	41	N/A
		Night	38	52
EPA Point 5	217 Martin Road, Badgerys Creek, 2555	Morning Shoulder	43	N/A
		Day	45	N/A
		Evening	40	N/A
		Night	38	52
EPA Point 6	50 Victor Avenue, Kemps Creek, 2178	Morning Shoulder	43	N/A
		Day	43	N/A
		Evening	43	N/A
		Night	38	52

Note 1: Noise criteria adopted from the EPL (EPL #684).

L4.5 For the purpose of the condition above:

- a) *Morning shoulder means the period from 5am and 7am Monday to Saturday and the period from 5am to 8am Sunday and public holidays.*
- b) *Day means the period from 7am to 6pm Monday to Saturday and the period from 8am to 6pm Sunday and public holidays.*
- c) *Evening means the period from 6pm to 10pm.*
- d) *Night means the period from 10pm to 5am Monday to Saturday and the period from 10pm to 5am Sunday and public holidays.*

2.2 Consent Noise Criteria

2.2.1 Operations

Schedule 3, Condition 5 of the consent outlines the applicable noise criteria for representative residential receivers surrounding the site and are presented in **Table 2**. The site includes the operation of a quarry and brickmaking plant, there are separate criteria relating to each period.

Table 2 Consent Noise Criteria¹					
Receiver (EPA Reference)	Morning Shoulder	Day	Evening	Night ²	
	dB LAeq(15min)			dB LA1(max) ³	
R9, R25, R35 (EPA Point 5)	43	45	40	38	52
R5, R26, R27, R28, R29, R30, R31, R32, R34, R42, R43, R44, R45, R46 (EPA Point 4)	42	42	41	38	52
R11, R12, R13, R14, R15 (EPA Point 6)	43	43	43	38	52
All other residences	N/A	40	35	35	52

Note 1: Noise criteria adopted from the Consent.

Note 2: Monitoring periods are defined in Section L4.5 of the EPL #684.

Note 3: Periods and parameters as expressed in the Consent.

2.2.2 Road Noise Criteria

Schedule 3, Condition 6 of the of the consent relating to road traffic noise are reproduced in **Table 3**.

Table 3 Road Traffic Noise Criteria dB(A)		
Road	Assessment Criteria (dBA)	
	Day and Evening	Night
	LAeq(1hour)	LAeq(1hour)
Prior to Martin Road and Elizabeth Road Intersection Upgrade		
Martin Road, Badgerys Creek, NSW	60	55
Following Martin Road and Elizabeth Road Intersection Upgrade		
RN5	61	55
RN9, RN21	62	55
RN14, RN22	63	55
RN16	64	55
All other residence on Martins Road	60	55

Note: The noise generated by the project is to be measured in accordance with the relevant procedures in the NSW Road Noise Policy.

Section 7.5.2 of the projects Noise Management Plan (NMP BRK-BAD-Noise Management Version 7, 21/02/2023) is reproduced below:

Road traffic noise monitoring will be conducted on a quarterly basis at one location for the first year of Phase 1 operations, or in response to any received complaints at a road traffic monitoring location along Martin Road, representative of noise sensitive receivers lodging the complaint.

Noise monitoring would ideally consist of attended monitoring over a one-hour period to accurately identify and quantify Project-related trucks against ambient (non-project) traffic flows. Alternatively, where unattended logging is the preferred approach, the logging device should satisfy specifications of a Type 1 sound level analyser and contain audio capabilities for source identification that can be cross checked with truck ingress and egress data from the site.

Furthermore, in-field noise measurements should be validated using calculation methodologies that are in accordance with Calculation of Road Traffic Noise (CORTN) algorithm (or equivalent), as developed by the UK Department of Transport or where traffic flows are <10,000 vehicles per day a model that can accurately calculate low flow noise levels such as US Federal Highways Administration TNM (or equivalent)

Figure 1 presents the identified receiver locations and representative measurement locations.

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3 Methodology

3.1 Operator Attended Noise Monitoring

The attended noise measurements were conducted in general accordance with the procedures described in Standards Australia AS 1055:2018, "Acoustics - Description and Measurement of Environmental Noise" and as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022). Attended measurements were conducted using a Svantek Type 1, 971 noise analyser. All acoustic instrumentation used carries appropriate and current NATA (or manufacturer) calibration certificates with records of all calibrations maintained by MAC as per Approved Methods for the measurement and analysis of environmental noise in NSW (EPA, 2022) and complies with AS/NZS IEC 61672.1-2019-Electroacoustics - Sound level meters - Specifications. Calibration of all instrumentation was checked prior to and following measurements. Drift in calibration did not exceed $\pm 0.5\text{dBA}$.

Attended noise measurements were of 15 minutes in duration and where possible, throughout each survey the operator quantified the contribution of each significant noise source. Measurements were conducted at three (3) locations (EPA 4, EPA 5, EPA 6) on Thursday 3 April 2025 during the day period to satisfy the requirements of the NMP and EPL. Attended measurements were not conducted during the evening and night periods due to the site not operating between the hours of 6pm and 7am.

Extraneous noise sources were excluded from the attended analysis to determine the $\text{LA}_{\text{eq}}(15\text{min})$ site noise contribution for comparison against the relevant criteria. In the event of site attributed noise being above criteria, prevailing meteorological conditions for the monitoring period are analysed in accordance with Fact Sheet D of the NPI to determine the stability category present at the time of each attended measurement.

Where the site is inaudible, the contribution is estimated to be at least 10dBA below the ambient noise level.

3.2 Attended Road Traffic Noise Monitoring

Attended road traffic monitoring was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM-1) using a Svantek Type 1, 971 noise analyser on Thursday 3 April 2025. It is noted that the historic traffic monitoring location was not used due to roadworks along Martin Road.

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4 Results

4.1 Traffic Monitoring Results

To assess road traffic noise levels associated with the site, a one (1) hour attended measurement was conducted on the boundary of 180 Martin Road, Badgerys Creek, NSW (RNM1), approximately 7m from the road centreline.

Traffic flows have been provided by CSR and included in the report to determine CSR traffic contribution along Martin Road during the measurement period. The results of the road traffic noise measurements on Thursday 3 April 2025 are summarised in **Table 4** showing the overall ambient LAeq(1hour) noise level, the CSR contributed LAeq(1hour) noise level and the relevant noise limit.

Results of the road traffic noise measurements identify that traffic noise levels related to CSR at RNM1 are below the relevant criteria.

Table 4 Road Noise Survey Results – RNM1 (Daytime¹)

Date & Time	Measured dB LAeq(1hour)	CSR Contribution dB LAeq(1hour)	Compliance Limit dB LAeq(1hour)
03/04/2025 14:51	66 ²	50 ³	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

Note 2: Overall ambient level.

Note 3: CSR contributed road traffic noise level from four (4) CSR truck passbys during the 1-hour period.

4.2 Road Traffic Compliance Assessment

Results of the road traffic noise measurements are calculated to all identified receivers showing the offset distance and the received level in **Table 5**. Results identify that traffic noise levels related to CSR at this location are below the consent criteria.

Table 5 Calculated Road Traffic Noise Levels (Daytime¹)

RTN ID	CSR Contribution dB LAeq(1hour) at RNM1	Offset from Road (m)	CSR Contribution dB LAeq(1hour) at Receiver	Compliance Limit dB LAeq(1hour)
RN1, RN19, RN24	50	120	34	60
RN2, RN12, RN13, RN26, RN27	50	60	37	60
RN3, RN4	50	90	35	60
RN5, RN6 RN15, RN25	50	45	38	60
RN7	50	250	30	60
RN8, RN11	50	160	32	60
RN9, RN14, RN16, RN21 RN22, RN23	50	30	40	60
RN10	50	75	36	60
RN17	50	140	33	60
RN18	50	240	31	60
RN20	50	105	34	60

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.3 Prevailing Meteorological Conditions

Weather data for the noise assessment period was sourced from Badgerys Creek AWS Site 67108 as well as operator observations at each measurement location. The data was used to determine prevailing meteorological conditions at the time of the attended measurements. Meteorological data is presented in **Table 6**. Furthermore, wind speed at the microphone height satisfies requirements of Fact Sheet A of the NPI.

Table 6 Prevailing Meteorological Conditions

Date & Time	Badgerys Creek AWS Site 67108 (10m AGL)		Operator Measured Weather Monitoring Location (1.8m AGL)	
	Wind Direction	Wind (m/s)	Wind Direction	Wind (m/s)
03/04/2025 13:37	SSW	5.1	SW	2.5
03/04/2025 14:03	SW	4.6	SW	2.5
03/04/2025 14:26	SSW	5.1	SW	2.5

4.4 Assessment Results - Location EPA 4

The monitored noise level contributions and observed meteorological conditions at Location EPA 4 are presented in **Table 7**.

Table 7 Operator-Attended Noise Survey Results - Location EPA 4

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
03/04/2025	14:26 (Day)	68	62	57	45	54	WD: SW WS: 2.5m/s Rain: Nil	Aircraft 40-68
								Birds 42-57
								Insects 41-43
								Wind in vegetation 39-52
								Traffic 40-65
								CSR hum 41-42
								(7 minutes)
CSR Site L _A eq(15min) Contribution								39
CSR Site L _A 10(15min) Contribution								<47

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.5 Assessment Results - Location EPA 5

The monitored noise level contributions and observed meteorological conditions at Location EPA 5 are presented in **Table 8**.

Table 8 Operator-Attended Noise Survey Results - Location EPA 5

Date	Time (hrs) ¹	Descriptor (dBA re 20μPa)					Meteorology	Description and SPL, dBA
		L _A max	L _A 1	L _A 10	L _A 90	L _A eq		
03/04/2025	14:03 (Day)	88	79	62	42	65	WD: SW WS: 2.5m/s Rain: Nil	Traffic 39-88
								Aircraft 41-68
								Other industry <40
								Birds 40-43
								Wind in vegetation 39-46
								CSR hum 40-43 (7 minutes)
CSR Site L _A eq(15min) Contribution								39
CSR Site L _A 10(15min) Contribution								<50

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.6 Assessment Results - Location EPA 6

The monitored noise level contributions and observed meteorological conditions at Location EPA 6 are presented in **Table 9**.

Table 9 Operator-Attended Noise Survey Results - Location EPA 6								
Date	Time (hrs) ¹	Descriptor (dBA re 20µPa)					Meteorology	Description and SPL, dBA
		LAmax	LA1	LA10	LA90	LAeq		
03/04/2025	13:37 (Day)	79	68	52	46	56	WD: SW WS: 2.5m/s Rain: Nil	Birds 45-60
								Wind in vegetation 44-48
								Aircraft 44-53
								Traffic 46-79
								Local residential noise 43-51
								CSR inaudible
CSR Site LAeq(15min) Contribution								<36
CSR Site LA10(15min) Contribution								<42

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

4.7 Operational Compliance Assessment

The monitored noise level contributions are compared against the relevant criterion for the assessment are presented in **Table 10**.

Table 10 Operational Compliance Assessment							
Receiver Location	Time (hrs) ¹	CSR Site Contribution	EPL Limit L _{A10} (15min)	Compliant	CSR Site Contribution	Consent Criteria	Compliant
		L _{A10} (15min)			L _{Aeq} (15min)	L _{Aeq} (15min)	
EPA 4	14:26	<47	50	✓	39	42	✓
EPA 5	14:03	<50	50	✓	39	45	✓
EPA 6	13:37	<42	50	✓	<36	43	✓

Note 1: Day - the period from 7am to 6pm Monday to Saturday or 8am to 6pm on Sundays and public holidays; Evening - the period from 6pm to 10pm; Night - the remaining periods.

5 Discussion

Noise measurements were not conducted during the evening or night periods at any location as CSR was not operational during these periods.

5.1 Assessment Results – Location RNM1

Offset calculations have been applied to assess attenuation of CSR traffic to residential receivers along Martin Road, Badgerys Creek. Monitoring on Thursday 3 April 2025 identified that CSR traffic movements remain below relevant noise limits during the daytime measurement period at location RNM1.

Extraneous sources such as other industry, insects, birds, traffic, wind in vegetation and aircraft were audible during the measurement period.

5.2 Assessment Results - Location EPA 4

Monitoring on Thursday 3 April 2025 identified that CSR activities were audible during the measurement period at location EPA 4, although site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as aircraft, birds, insects, wind in vegetation and traffic were audible during the measurement period.

5.3 Assessment Results - Location EPA 5

Monitoring on Thursday 3 April 2025 identified that CSR activities were audible during the measurement period at location EPA 5 although, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as traffic, birds, other industry, aircraft and wind in vegetation were audible during the measurement period.

5.4 Assessment Results - Location EPA 6

Monitoring on Thursday 3 April 2025 identified that CSR activities were inaudible during the measurement period at location EPA 6. Therefore, site the contribution was estimated to be below the relevant noise limits during the assessed day period.

Extraneous sources such as birds, wind in vegetation, aircraft, traffic and local residential noise were audible during the measurement period.

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6 Conclusion

Muller Acoustic Consulting Pty Ltd (MAC) has completed a Noise Monitoring Assessment (NMA) commissioned by PGH Bricks & Pavers Pty Limited (PGH) for the CSR Advanced Manufacturing Hub (CSR) at 235 Martin Road, Badgerys Creek, NSW. The assessment was completed to assess the site's compliance with the EPL noise limits and consent noise criteria for the quarter ending April 2025.

Operator attended noise monitoring was undertaken on Thursday 3 April 2025 at three (3) representative receiver locations. The assessment has identified that noise emissions generated by CSR were measured to be below the relevant noise criteria throughout the survey period, satisfying the relevant noise conditions.

Road traffic noise levels were influenced by extraneous noise sources such as insects, birds and local road traffic not associated with CSR. Notwithstanding, CSR road traffic noise levels comply with the relevant road noise criteria.

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Appendix A – Glossary of Terms

A number of technical terms have been used in this report and are explained in **Table A1**.

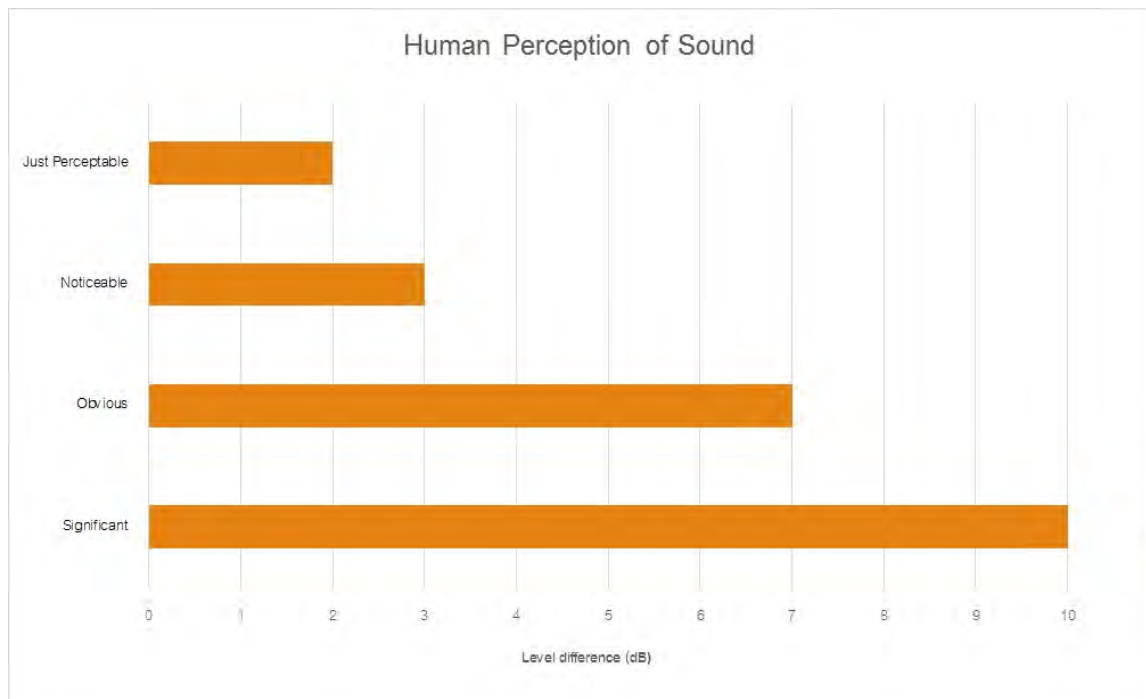
Table A1 Glossary of Acoustical Terms	
Term	Description
1/3 Octave	Single octave bands divided into three parts
Octave	A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit.
ABL	Assessment Background Level (ABL) is defined in the NPI as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Ambient Noise	The total noise associated with a given environment. Typically, a composite of sounds from all sources located both near and far where no particular sound is dominant.
A Weighting	A standard weighting of the audible frequencies designed to reflect the response of the human ear to sound.
Background Noise	The underlying level of noise present in the ambient noise, excluding the noise source under investigation, when extraneous noise is removed. This is usually represented by the LA90 descriptor
dBA	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
dB(Z), dB(L)	Decibels Z-weighted or decibels Linear (unweighted).
Extraneous Noise	Sound resulting from activities that are not typical of the area.
Hertz (Hz)	The measure of frequency of sound wave oscillations per second - 1 oscillation per second equals 1 hertz.
LA10	A sound level which is exceeded 10% of the time.
LA90	Commonly referred to as the background noise, this is the level exceeded 90% of the time.
LAeq	Represents the average noise energy or equivalent sound pressure level over a given period.
LAmx	The maximum sound pressure level received at the microphone during a measuring interval.
Masking	The phenomenon of one sound interfering with the perception of another sound. For example, the interference of traffic noise with use of a public telephone on a busy street.
RBL	The Rating Background Level (RBL) as defined in the NPI, is an overall single figure representing the background level for each assessment period over the whole monitoring period. The RBL, as defined is the median of ABL values over the whole monitoring period.
Sound power level (Lw or SWL)	This is a measure of the total power radiated by a source in the form of sound and is given by $10 \cdot \log_{10} (W/W_0)$. Where W is the sound power in watts to the reference level of 10^{-12} watts.
Sound pressure level (Lp or SPL)	the level of sound pressure; as measured at a distance by a standard sound level meter. This differs from Lw in that it is the sound level at a receiver position as opposed to the sound 'intensity' of the source.

Table A2 provides a list of common noise sources and their typical sound level.

Table A2 Common Noise Sources and Their Typical Sound Pressure Levels (SPL), dBA

Source	Typical Sound Pressure Level
Threshold of pain	140
Jet engine	130
Hydraulic hammer	120
Chainsaw	110
Industrial workshop	100
Lawn-mower (operator position)	90
Heavy traffic (footpath)	80
Elevated speech	70
Typical conversation	60
Ambient suburban environment	40
Ambient rural environment	30
Bedroom (night with windows closed)	20
Threshold of hearing	0

Figure A1 – Human Perception of Sound



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